

## Progressive Revenue Sharing in MLB: The Effect on Player Transfers

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### Abstract

The 1997 collective bargaining agreement between the Major League Baseball owners and players' union altered MLB's system of sharing revenue sharing between clubs. The new system, a convoluted cross-subsidization scheme, by design progressively redistributed income from the highest revenue generating clubs toward the lowest revenue-producing clubs. The 2003 agreement extended this method of revenue redistribution, but with an increased the tax rate and modified process. The purpose of the revenue sharing system was to alleviate a growing disparity in revenue generation, which MLB claimed caused competitive imbalance. We examine progressive revenue sharing theoretically, within the principal-agent framework, and shows that the incentive to divest in talent is increased for lower revenue producing clubs. Empirical results are supportive. Payroll disparity and competitive imbalance increased modestly from the period immediately preceding implementation. Most striking however is the alteration in transfer rates of players, in particular the increased flow of productive talent away from the lowest revenue clubs. We show conclusively that low revenue producing clubs acted on the increased incentives to divest in talent.

**JEL Classification Codes:** J50, L20, L83

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## 1. Introduction

The 1997 Basic Agreement<sup>1</sup> (1997BA), the collective bargaining agreement between the Major League Baseball (MLB) owners and the players' union (Major League Baseball Players Association, MLBPA) considerably altered MLB's system for collecting and redistributing club generated revenues. Under the previous system, the sharing of club generated income in MLB consisted of primarily a small, fixed-percent, of gate receipts due the visiting club.<sup>2</sup> A progressive cross-subsidization system, initially known as the "split pool plan", replaced the simple gate sharing method. The innovative system is described as progressive here, because by design increasingly larger shares of the pooled income—all revenue collected by the league and designated for redistribution—are awarded to the lowest revenue-producing clubs. The levy on local revenues was phased in gradually over the length of the 1997BA reaching a maximum of rate 20% in 2001. The 2003 Basic Agreement (2003BA) extended the basic system of progressive revenue redistribution through the 2006 season. The tax rate on local revenues increased to a constant rate of 34% for each year of the term of the 2003BA.

The affirmed purpose of the progressive revenue sharing system was to alleviate a growing disparity in club specific (local) revenue generation, which MLB has claimed to cause increased levels of competitive imbalance. MLB Commissioner, Alan "Bud" Selig, was adamant and persistent with his 1997 declaration that growing revenue disparity distorts competitive balance and causes severe economic problems because fans in small market cities

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<sup>1</sup> Though agreed to by MLB and the MLBPA in 1997 revenue sharing provisions of the agreement were retroactive to the 1996 season.

<sup>2</sup> The actual home-visitor share was different in each of the two leagues. Fort and Quirk (1995, p. 1286) report that the American League (AL) split was an 80%:20% home team to visiting team ratio; the National League (NL) home team share was 95%.

have lost “hope and faith” of a championship. Selig cited as evidence the MLB commissioned report, completed by the so-called “Blue Ribbon Panel” of experts (hereafter the BRPR), which showed clubs in the highest payroll quartile had won more than 90% of all playoff games since 1994. Notwithstanding, independent economists have pointed out the fallacies of this report (Eckard 2001, for example). Throughout both the 1997 and 2003 collective bargaining negotiations, MLB implored the MLBPA to agree to adopt measures that correct competitive imbalance. In addition to progressive revenue sharing, a luxury tax on payrolls was implemented through the 1997BA and continued, albeit in different form, (and renamed the competitive balance tax) with the 2003BA.

The MLB revenue sharing scheme was innovative because the league collects a fixed percentage of *all* net local revenues. This tax on each club’s local revenue is pooled with league-generated income, primarily national broadcast and licensing revenue, and provides the total fund, known as the central pool, set for redistribution. The principal-agent framework provides an appropriate method by which to examine progressive revenue sharing. A basic construction, defining the league as the principal and the individual clubs (owners) as the agents, shows institutional changes imposed by progressive revenue sharing bring about a new set of agent incentives. The intended effect is to restrain the rate of talent acquisition by high-income clubs by reducing the marginal revenue associated with winning. Simultaneously, the redistributions provide low-income clubs with additional resources that *may* assist them in the procurement of talent and consequently improve competitive balance. Notwithstanding, the subsidy received by low-revenue clubs is inversely proportional to the amount of local revenue generated; the unintended consequence is thus, that the incentive to win—conditioned on the principle that wins and revenue generation are positively correlated—is reduced for low revenue clubs. The progressive revenue sharing plan effectively increases the marginal tax rate on the lowest

revenue producing clubs, decreasing their incentive to produce wins and the corresponding increases in local revenue.

Conventional wisdom holds that increasing the level of revenue sharing among its clubs will diminish problems of competitive imbalance in a professional sports league. The economic effects of pooling and sharing revenues in professional sports leagues has been examined by a number of writers, beginning with the rigorous economic model of a sports league by Quirk and El Hodiri (1971).<sup>3</sup> The theoretical conclusions, rightly pointed out by Kesenné (2000), are inconsistent, and often vary given the stated assumptions, such as those placed on owner behavior. Fort and Quirk (1995) showed that basic gate revenue sharing has no effect on balance, but does depress player salaries. Others, including Atkinson et al. (1988), Fort and Quirk (1995), Vrooman (1995 and 1996), Rascher (1997), Marburger (1997), and Kesenné (2000) each provided substantiation that under certain circumstances revenue sharing improves competitive balance.<sup>4</sup> Syzmanski and Kesenné (2004) conversely, demonstrated that under reasonable circumstances increased levels of sharing gate revenue may worsen balance.

Empirical tests on the effects of revenue sharing are very scarce and equally inconclusive. Atkinson et al. (1988) claim their results indicate that the equal revenue sharing of national television revenue in the National Football League (NFL) is consistent with better competitive balance. Fort and Quirk (1995) provided evidence that competitive balance as measured by dispersion of club win percents has changed very little over time in any of the four major sports leagues. They put forth, that regardless of revenue sharing and other institutional constraints (except salary-payroll caps) on player labor markets, competitive balance is largely invariant. An impediment to empirical tests has been that the natural experiment where a

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<sup>3</sup> For a thorough review of the theoretical literature and much of the empirical work to date, see Sysmanski (2003).

<sup>4</sup> There is no particular consistency on exactly what are these circumstances. For example Rascher (1997) and Kessené (2000) show that if owners' behavior is modeled as utility maximizing rather than profit maximizing revenue sharing improves balance. Atkinson et. al, (1988) on the other hand, claim exactly the opposite, and that utility maximizing behavior in the NFL causes greater imbalance.

professional team-sport league has radically altered its revenue sharing plan is heretofore nonexistent.

Although revenue sharing or cross-subsidization has many potential arrangements, comparisons across leagues are difficult, if not inappropriate, because of institutional differences of far greater consequence than the alternative methods of sharing revenue. The standard revenue sharing practice in US professional sports leagues is traditionally an even (1/n) split of central or league-collected income—comprised primarily of the revenues generated by national broadcast contracts, negotiated by the Commissioner’s office. The National Basketball Association (NBA) and National Hockey League (NHL), prior to 2005-06, shared only league-generated revenues. The National Football League (NFL), like pre-1996 MLB, combines league-generated revenue with a home team-disproportionate split of the local gate.<sup>5</sup> The NHL joined MLB by also placing a tax on local revenue as part of a new collective bargaining agreement negotiated in 2005.

Changes in the distribution of playing talent across clubs are typically evaluated by assessing disparities in club payrolls over time, or by examination of variation in the statistical measures of competitive balance, such as the standard deviation of winning percentage. We put forth the argument that empirical tests that focus on only these factors are too coarse to illuminate alterations in the distribution of talent that may result from the change of revenue sharing scheme. Instead, an empirical analysis of player transfers between clubs offers a more thorough evaluation of alterations the talent flows and distributions brought on by changes in the revenue sharing method. MLB’s new progressive scheme provides the rare opportunity to test the effects of revenue sharing given a significant institutional change in league revenue sharing policy.

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<sup>5</sup> In the NFL the home team keeps 60% of the gate with the remaining 40% pooled and redistributed in even shares. (Fort and Quirk 1995, p. 1286).

The paper proceeds as follows. The next section provides the details of the revenue sharing aspects of the 1997BA and the 2003BA. The following section offers a theoretical model comparing the progressive revenue redistribution with the more conventional straight pool plan and discerns the effects of each scheme on club owners' incentives. Presentation and discussion of empirical results on payroll dispersion, competitive balance, and regression analyses of player transfers comprises section four, which is followed by concluding remarks, and suggestions for further research.

## **2. The MLB Revenue Sharing Plan**

The 1997BA did not provide for an immediate and full adoption of the split pool revenue sharing plan. The split pool scheme was phased in gradually over the 1996-1999 seasons and was fully implemented for the 2000 and 2001 seasons. Under the original formulation of the split pool method, twenty-percent of all club generated net revenue (primarily gate revenue, other stadium revenues, and local broadcasting revenue) was pooled with MLB league generated revenues—those collected directly by MLB, primarily from national broadcasting contracts, licensing, and royalties—for the purpose of redistribution. The total MLB pooled revenue (called the central pool) was redistributed so that seventy-five percent was divided equally among all clubs. The remaining twenty-five percent was redistributed in full to the clubs generating a below-the-mean amount of local revenue, with the shares received inverse in proportion to the club's revenue generation.<sup>6</sup>

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<sup>6</sup> The exact wording on the "split pool plan" from the 1997BA follows: (MLB, 1997 p.88)

The "Split Pool Plan" operating at full (100%) implementation, the amount of net payment or net receipt for each Participating Club shall be determined as follows: Each Participating Club contributes 20% of its Net Local Revenue to a putative pool; 75% of that pool is divided equally among all Participating Clubs; the remaining 25% of the pool is divided only among Participating Clubs below the arithmetic mean of Net Local Revenue in proportion to each such Club's

Prior to full implementation, a hybrid plan was utilized on a sixty-percent basis for 1996 and 1997; meaning that clubs received 60% of their best possible subsidy. The split pool was executed at 80% in 1998 and 85% in 1999; signifying that each club's net tax or subsidy was that percentage of the full split pool plan.<sup>7</sup> The 2003BA modified the split pool so that each club contributed thirty-four percent of their net local revenue, which was redistributed in even shares. However, clubs producing below-the-mean levels of local revenue receive progressively higher shares of the initial central fund— again the revenue collected directly by MLB including national broadcast revenue and revenue generated by MLB properties. The redistribution process from the Central Fund Component (CFC) is indistinguishable from the split pool, in that it provides subsidy payments with an inverse relationship to revenue generation. However, the CFC share is determined by averaging local revenue over the most recent three-year period rather than an annual adjustment. Those eligible for the CFC redistribution include all clubs that received a local pool redistribution payment that was greater than their contribution— designated

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distance from said average, with the difference between each Club's payment into the putative pool and its receipt or receipts there from producing the net payment or net receipt for that Club.

Intent of the Plan:

(a) NET TRANSFER VALUE. The intent of the revenue sharing plan is to effect a net transfer of Net Local Revenue among Participating Clubs of \$70 Million at 100% implementation of the plan, based on 1994 projections.

(b) MARGINAL TAX RATE. The maximum marginal tax rate on Payor Clubs under the plan shall not exceed 20% at full (100%) implementation of the plan.

<sup>7</sup> During the phase-in period (planned) subsidies exceeded (planned) revenue collections. In 1996 “superstation” payments bridged the gap and from 1997-1999 the difference was made up with a league-collected “luxury tax” placed on teams with the highest payrolls.<sup>7</sup> Those teams exceeding a predetermined payroll threshold (\$51 Million in 1997, \$55 Million in 1998, \$59.8Million in 1999) were charged a tax of 35% of their payroll (34% in 1999). Additionally all teams were charged a 2.5% payroll tax for the 1996 and 1997 seasons. Superstation payments are those MLB received from the so-called superstation broadcast networks that televise MLB games nationally include Atlanta-based TBS and Chicago-based WGN.

as payee clubs. Payee clubs have produced average net local revenue that is below the league mean for each of the previous three seasons, to be eligible for the CFC subsidy.<sup>8</sup>

Both subsidy systems pay the largest shares to clubs that generate the smallest amounts of local revenue. On the surface this is the goal of an income redistribution plan, but it is not clear that income redistribution provides the proper incentives for clubs eligible to receive larger proportional shares to invest in talent and therefore improve competitive balance across the league. The optimal outcome for a league that generates a positive economic return to a

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<sup>8</sup> The exact wording on the “Central Fund Component” from the 2003 BA follows: (MLB, 2003 p.102-3)

The revenue sharing plan shall also have a “Central Fund Component” under which a portion of Major League Central Fund money will be reallocated from Payor Clubs to Payee Clubs. The amount of net payment or net receipt under the Central Fund Component for each Club shall be determined as follows:

(a) Net Transfer Value. At 100% implementation, the net transfer value of the Central Fund Component, in each revenue sharing year, shall be 41.066% of the net transfer value of the Base Plan in that revenue sharing year. “Net transfer value” shall mean the sum of the amounts transferred from Payor Clubs to Payee Clubs.

(b) Contributors and Recipients. During each revenue sharing year, Major League Central Fund money shall be reallocated from Clubs that are Payor Clubs for that revenue sharing year (“Contributors”). Distributions under the Central Fund Component for each revenue sharing year shall be made only to Clubs that: (i) are Payee Clubs for that revenue sharing year, and (ii) have a mean Net Local Revenue for the preceding three revenue sharing years that is below the industry’s mean Net Local Revenue for that three-year period (“Recipients”).

(c) Calculation

(i) Contributors. To determine the amount of Major League Central Fund money to be reallocated from each Contributor (at 100% implementation), multiply the Contributor’s mean Net Local Revenue for the preceding three revenue sharing years by a fraction, the numerator of which is the net transfer value of the Central Fund Component in that revenue sharing year and the denominator of which is the sum of the means of each Contributor’s Net Local Revenue for the preceding three revenue sharing years.

(ii) Recipients. To determine the amount of Major League Central Fund money to be distributed to each Recipient (at 100% implementation), multiply the net transfer value of the Central Fund Component in that revenue sharing year by a fraction, the numerator of which is the difference between the industry’s mean Net Local Revenue for the preceding three revenue sharing years and the Recipient’s mean Net Local Revenue for that period, and the denominator of which is the sum of all such differences for each of the Recipients.



marginal improvement in competitive balance logically occurs when clubs at the bottom of the scale improve their talent stock. The potential problem is the creation of a negative externality by altering incentives, which encourage lower revenue producing clubs to restrain their investment in talent in order to collect a larger subsidy. The undesirable consequence is twofold. First, the overall league-collected pool is smaller because of the lessened local contribution by such clubs. Second, since winning theoretically produces more revenue, some clubs may choose not to invest in an adequate (efficient) level of talent and greater competitive imbalance results, also reducing total league revenue.<sup>9</sup> The theoretical model discerns the circumstances where progressive sharing creates a negative externality.

### 3. Theoretical Model

Models of straight pool and progressive revenue sharing plans employed by a sports league are incorporated. The straight pool model is a modification of the model developed by Atkinson et al (1988) that assumes a league of  $n$  clubs, each with separate ownership. The league objective is profit maximization by way of maximizing the profits of each club so that

$$(1) \quad \Pi = \sum_{i=1}^n \pi_i .$$

Club profits are simply the difference in total revenues, which includes all retained, locally generated, revenue plus all monies redistributed to each club through the leagues central fund  $CF$ , and total costs so that

$$(2) \quad \pi_i = TR_i - TC_i.$$

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<sup>9</sup> The 2007BA, which runs through the 2011 championship season has purports to have resolved the short term incentive problems of increasing marginal tax rate. The new agreement sets the CFC distribution for each club at a fixed rate throughout the period. The plan reflects a straight pool (see Zimbalist, 2006). All clubs contribute 31% of their net local revenue and the CFC is redistributed so that the overall effect replicates a 48% straight pool.

Each club's local revenue  $LR_i$  is a function of its win percent  $w$ , which is in turn a function of its talent investment  $t$ , and local demand characteristics  $D_i$  including metropolitan population, per capita income, and stadium factors. So that

$$(3) \quad LR_i(w(t)D_i).$$

The profit function for a club in a league employing straight pool revenue sharing is modeled as follows

$$(4) \quad \pi_i = (1 - \alpha)LR_i(w(t)D_i) + \alpha / n \sum_{j=1}^n [LR_j(w(t)D_j) + CF] - [ct_i + \mu(\rho ct_i)]$$

where  $\alpha$  is the fraction of revenue each club contributes to the pool. For the sake of simplicity, only the variable cost of talent is included in the cost function. The talent market is assumed to have a finite number of players, and thus represents a zero sum game, as talent hired by one club is denied the others. The variable costs  $ct_i$  are determined as the number of units of talent hired at a cost of  $c$  per unit. For cases where a luxury tax/competitive balance tax is placed on payrolls exceeding a threshold, the cost function is represented as  $TC = ct_i + \mu(\rho ct_i)$ , where  $\rho$  designates the tax rate, and  $\mu = 1$  for clubs exceeding the payroll threshold and 0 otherwise.

Alternatively, the profit function for clubs in a league employing a progressive sharing scheme, returning disproportionately large shares to those with below-the-mean local revenues, is as follows,

$$(5) \quad \begin{aligned} \pi_i = & (1 - \alpha)LR_i(w(t)D_i) + \alpha\beta / n \sum_{j=1}^n [LR_j(w(t)D_j) + CF] \\ & + \lambda(1 - \alpha)\beta\delta_i(LR_i, \overline{LR}) \sum_{j=1}^n [LR_j(w(t)D_j) + CF] - [ct_i + \mu(\rho ct_i)] \end{aligned}$$

where  $\lambda = 1$  if  $\overline{LR} > LR_i$ ; 0 otherwise. The weighting term,  $\delta_i$ , indicates that those clubs receiving a portion of the subsidy pool do not receive equal  $1/n$  shares. The share is larger for smaller amounts of local revenue generated, so that

$$\delta_i = f(\overline{LR} - LR_i), 0 < \delta_i < 1; \partial f / \partial LR_i < 0, \text{ and } \sum_{i=1}^m \delta = 1.$$

Although local revenue is also determined in part by such factors as the effort applied to selling broadcast rights, stadium signage, luxury boxes, and other marketing efforts, this model will limit the club's problem to its choice of a revenue maximizing level of talent to maximize the objective functions in (4) and (5).

The first order condition for the straight pool plan is

$$(6) \quad (1 - \alpha) \sum_{j=1}^n \frac{\partial LR_i}{\partial w_j} \frac{\partial w_j}{\partial t_i} + \frac{\alpha}{n} \sum_{j=1}^n \sum_{k=1}^n \frac{\partial LR_j}{\partial w_i} \frac{\partial w_k}{\partial t_i} - [c + \mu \rho c] = 0$$

Signing (6) reveals a positive first term offset by negative second and third terms. The negative second term may provide the necessary disincentive that internalizes the externality caused by the over investment in talent by the top revenue generating clubs. The negative third term shows that the luxury tax reduces the incentive to hire talent beyond the payroll threshold.

The first order condition for the progressive redistribution plan is

$$(7) \quad (1 - \alpha) \sum_{j=1}^n \frac{\partial LR_i}{\partial w_j} \frac{\partial w_j}{\partial t_i} + \frac{\alpha \beta}{n} \sum_{j=1}^n \sum_{k=1}^n \frac{\partial LR_j}{\partial w_i} \frac{\partial w_k}{\partial t_i} + \lambda(1 - \alpha) \beta \frac{\partial \delta_i}{\partial LR_i} \frac{\partial LR_i}{\partial w_i} \frac{\partial Lw_i}{\partial t_i} \sum_{j=1}^n \sum_{k=1}^n \frac{\partial \delta_j}{\partial LR_j} \frac{\partial LR_j}{\partial w_k} \frac{\partial w_k}{\partial t_i} - [c + \mu \rho c] = 0$$

Equation (7) adds an additional term, the product of  $\lambda(1 - \alpha)\beta$ , reflecting the change in the secondary pool share given a change in talent level for below-the-mean revenue producing clubs. This term signs negative and indicates a decreased incentive toward talent investment for the pertinent clubs. The first part of the term shows that increasing talent increases local revenue and reduces the club's share of pooled revenue. The second part of the term shows that when a club increases its level of talent, other clubs' local revenue decline and their shares of the pool increase, reducing the amount left over for club i.

The progressive redistribution theoretically creates greater incentive for below-the-mean revenue clubs to divest in talent than is the case for a straight pool system. If low revenue clubs respond to this incentive, the progressive redistribution plans create an unnecessary negative externality by increasing competitive imbalance. Nevertheless, for that to happen the gains from divesting (terms two and three and four) must exceed the returns to investing in talent (term one). Verification requires empirical tests.

#### **4. Empirical Analysis**

A simple test of the hypothesis is an examination of revenue and payroll disparity before and after the implementation of progressive revenue sharing. Table 1 shows statistics from 1990 through 2005 championship seasons. Reported are calculations of the coefficient of variation on payroll and total revenue dispersion (after redistribution since 1996) and gate revenue dispersion, the best available proxy for local revenue variation.<sup>10</sup> There is evidence of increased payroll dispersion throughout the progressive revenue sharing period. The Montreal Expos (Washington Nationals since 2005), the club with the lowest payroll in four of the six years immediately following the implementation of progressive revenue sharing, actually cut their club payroll from \$18 million to \$8 million dollars between the 1997 and 1998 championship seasons. The Tampa Bay Devil Rays either had, the lowest, or second from the lowest, club payroll throughout the duration of the 2003BA; and they nearly halved their payroll from \$35Million to \$19Million to start the 2003 season. A recent example of apparently flagrant divestment is the Florida Marlins, who reduced their payroll from \$60Million to \$15Million prior to the 2006 championship season. These examples support the claims of some high-revenue club owners, such as the New

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<sup>10</sup> Data on MLB club finances, including breakdowns by revenue source is compiled from a variety of sources and collected at Rodney Fort's *Sports Business Data Pages*. Sources include *Financial World* 1990-1996, *Forbes* 1997-2005, MLB Commissioner's Office 2001. The revenue source data are not consistent through the time period in regard to total local revenue by club. It is variously reported only before revenue sharing, only after revenue sharing, or not at all. Total gate revenue produced by each club is reported consistently throughout the period.

York Yankees George Steinbrenner, that there is no reinvestment of revenue sharing funds in talent by the payee club owners, and the result is an inferior product on the field. Nonetheless, supporters of revenue sharing claim that low payroll clubs are investing more aggressively in their minor league farm systems and are therefore better able to field more talented clubs over the long run.<sup>11</sup>

In general, the payroll statistics provide some support for the proposal that progressive revenue sharing has caused low revenue producing clubs to reduce their investments in talent. The coefficient of variation for total revenue since progressive revenue sharing is consistent with prior averages, indicating that revenue sharing has alleviated growing disparities in revenue production over the period. However, the coefficient of variation for gate revenue has increased significantly since the implementation of progressive revenue sharing; this mirrors the trend in payroll dispersion, implying that gate revenue is an important driver of talent acquisition decisions.

**(INSERT TABLE 1 ABOUT HERE)**

Notwithstanding, payroll dispersion when used as a measure of talent distribution in MLB is problematic. Prior studies have examined this phenomenon. Zimbalist (1992) Quirk and Fort (1999) and Hall et al. (2002) find very low levels of correlation between payrolls and winning, though the latter does find that this correlation is stronger since 1994. A likely cause of this incongruous association is MLB's multi-tiered labor market, which distorts the connection between payroll and talent. Only free agent eligible players, those with six or more years of MLB service, receive a wage reflecting a competitive market. Other players, bound to their clubs by a contractual reserve clause, earn below their market value.<sup>12</sup> Furthermore, a club's payroll does not accurately reflect its investment in talent. Investments in scouting and player

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<sup>11</sup> See Associated Press (2004) for examples of both types of comments.

<sup>12</sup> This is well documented in the literature. See Zimbalist (1994) for example.

development costs must also be given consideration. Clubs that have invested poorly in player development, often end up paying more for similar levels of talent, as they are compelled to invest disproportionately in higher priced free agents.<sup>13</sup> Examination of actual on-field measures of competitive balance provides additional insight.

Vrooman (1996) offers that there are three dimensions by which to gauge competitive balance. These include closeness of within season competition, discontinuity of club performance from season to season, and minimal large market dominance (small market weakness). Quirk and Fort's (1992) ratio of actual to ideal standard deviation of win percent (SDWP) is the standard metric used to test the former, and had been used in numerous studies measuring competitive balance. Season-to-season continuity is a more ambiguous concept, and calculations of frequency, or dispersion of, championships, playoff appearances, etc. fall into this category. Quirk and Fort (1992) provide a wealth of historical data of this sort for all four North American professional sports leagues. Fort (2001) also reports detailed statistics on the distribution of championships for MLB through 2000.

Consistency of club standings also falls within the category of season-to-season continuity. Daly and Moore (1981) and Maxcy (2002) employ the Spearman's Rank Correlation Coefficient (SRCC) to test year- to-year changes in club standings. Humphreys (2002) provides a thorough review of other methods that attempt to capture season-to-season change. He also introduces the Competitive Balance Ratio (CBR) that is a ratio of within season standard deviation of league win percent, and standard deviation of club win percents of a determined period of time. Hadley, Ciecka, and Krautmann (2005) develop an inter-seasonal measure of

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<sup>13</sup> Hall et al. (2002) also identify the uncompetitive aspects of the MLB labor market for the lack of correlation. They offer a somewhat different explanation stating diminished player movement by trade in the free agent era is the crux of the problem. That observation is open for debate. Maxcy (2002) for example finds that the mobility rates of productive players have increased significantly in the free agent era.

competitive balance based on a Markov model of a team's probability of qualifying for postseason play given the performance of the team in the previous season.

Table 2 shows SDWP and SRCC for each the 1990-2005 championship seasons. Imbalance shows a statistically significant increase starting in 1997. These findings are consistent with Fort (2001) and Humphreys' (2002) CBR results, and Hadley, Ciecka, and Krautmann (2005), who each detect an statistically significant increase in imbalance since 1995. Once more, the results impart corroboration that split pool revenue sharing provided improper incentives for low revenue clubs. Nonetheless, the number of observation years is too few to validate a conclusion, and coupled with the increased gate revenue dispersion greater levels of imbalance is expected, regardless of an altered revenue sharing plan. Additionally, the progressive schemes introduced by each collective bargaining agreement are different enough to warrant separate examination.

**(INSERT TABLE 2 ABOUT HERE)**

Imbalance as reflected large market dominance/small market weakness is not at the forefront of economic analysis, although Daly and Moore (1981) and Vrooman (1996) have given it consideration. In each case, the authors found that increased labor market freedom has amplified talent flow toward larger markets.<sup>14</sup> The issue is the crux of MLB's case that competitive imbalance is a growing problem. The BRPR cites as evidence the very limited ability of clubs outside the top payroll quartiles to obtain post-season success since 1995. Their results, though not manifestly refutable, rely on a flawed line of reasoning that implies both that payroll is highly correlated with revenue generation and that the payroll/revenue quartiles are static in membership. Although there is little doubt that clubs in markets with greater revenue

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<sup>14</sup> Vrooman offers the curious observation that the increased movement of free agents towards large markets is responsible for improving standard measures of competitive balance. Talented small market clubs are broken up more quickly and brought back to mediocrity. Many of the larger market clubs who sign free agents do so inefficiently and do not obtain gains corresponding to the small market clubs' losses. The result is that all parties wallow in mediocrity. This provides strong measurements of balance, but may be detrimental to the overall product.

potential have historically been more successful, the test here is to determine whether progressive revenue sharing has augmented the problem.

The definitive empirical examination tracks actual player movement between clubs. The initial test is to determine whether progressive revenue sharing, in both formulations, has altered transfer dynamics in MLB, all else constant. The effects of progressive revenue sharing on the flows of transferring players between clubs, based on revenue characteristics and club quality separately, for each of the three collective bargaining agreements represented in the sample period, are further analyzed. Should productive players be more likely to transfer away from, and less likely to transfer toward, lower revenue producing clubs, all else constant, support is provided for the hypothesis that progressive revenue sharing brings on negative incentives for low revenue clubs to procure talent.

The data are derived from the set of 10,270 player-year observations for all MLB position-players from the 1990 through the 2005 championship seasons. We eliminate the 1,795 players that exited MLB the season immediately following the observation year. The sample is further restricted to statistically relevant performance statistics by eliminating all observations representing fewer than thirty plate appearances.<sup>15</sup> The analysis presented here also removes all within-season transfers, so as to focus on only the between-season labor market. The final analysis represents a total of 6,935 player year observations, and includes 1,790 trades, sales, and free agent signings completed during the inter-season trading markets each year.<sup>16</sup>

Club-year characteristics that reveal motivation for participation in the between-season labor market are the focus of the analysis. The inter-season transfer market, comprised primarily of trades and free agent signings, is motivated by the club's assessment of each player's marginal

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<sup>15</sup> Players year observations representing for the fifty-one transfers to expansion clubs in 1994 and 1998 are also eliminated because club differences cannot be calculated or estimated.

<sup>16</sup> For the inter-season analysis player-year observations individual performance statistics reflect seasonal totals and one observation per player per year.



revenue product (MRP). Players move toward their high-value user given this market is sufficiently lacking restrictions. Without significant disparity in revenue generating potential, variation in clubs' current talent quality drives the market. A productive player's expected marginal product will be greater for lower performing clubs setting in motion a natural flow of talent from better to worse performing clubs. Likewise, when variation in revenue generation is included in the equation, talent flows toward higher revenue producers are expected, because a player's expected MRP increases in such cases.

In order to evaluate whether progressive revenue sharing has altered the flow of talent between teams, the variables win percent and normalized gate revenue for the clubs employing the player in the seasons surrounding the transfer are incorporated.<sup>17</sup> Variables on player characteristics, performance, and league modifications expected *a priori* to influence the likelihood of transfer are included for each observation. Individual player attributes include measures of performance and playing time, negotiation status, and whether the player has previously transferred. LOGIT models test the significance of these factors to the probability that a given player transfers to another club.

$$(8) \text{TRANSFER}_{it} = \beta_0 + \beta_1 \text{FA} + \beta_2 \text{PRESWITCH}_{it} + \beta_3 \text{PROD}_{it} + \beta_4 \text{NL}_t + \beta_5 \text{TEAMS}_t + \beta_6 \text{1997BA} + \beta_7 \text{2003BA} + \beta_8 \text{WIN}_{it} + \beta_9 \text{WIN}_{it+1} + \beta_{10} \text{GATE}_{it} + \beta_{11} \text{GATE}_{it+1} + e.$$

The variables are defined as follows.

*TRANSFER<sub>it</sub>*: A binomial dummy variable, coded 1 if the player-year observation indicates a transfer to another MLB club with the succeeding observation, 0 otherwise.

*FA<sub>it</sub>*: A binomial dummy variable, coded 1 if the player year observation indicates free agent status at the completion of year t, 0 otherwise. Players with six or more years of MLB service are

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<sup>17</sup> Gate revenue is chosen as a proxy for local revenue as it is the best revenue source for which data is available throughout the entire sample period.

granted free agent status at the end of a current contract and may initiate transfers, while others may transfer only at club discretion. Free agent status is also granted to significant number of players following their release by a club. Player transaction records, as reported by *Retrosheet.org*, do not distinguish the two types of free agents.

*PRESWITCH<sub>it</sub>*: A binomial dummy variable, coded 1 if the player year observation indicates a previous transfer so that the player was no longer with his original MLB club to start year  $t$ , 0 otherwise. A player who has never transferred may have greater firm specific human capital, or clubs may act irrationally to sunk costs, as they have more player development costs invested in players trained in their minor league systems. Either scenario yields an *a priori* positive coefficient estimate.

*PROD<sub>it</sub>*: A vector of variables that indicate the player's production during the observation year. Slugging Average (*SA*) is employed to capture skill independent of club factors. Plate appearances (*PA*) (projected to 162 game estimates for the strike-shortened 1994 and 1995 seasons) specify a playing time aspect of performance.

*WIN<sub>it</sub>*: The win percent of player  $i$ 's year  $t$  club in year  $t$ .

*WIN<sub>it+1</sub>*: The win percent of player  $i$ 's year  $t+1$  club in year  $t$ .

*GATE<sub>it</sub>*: The normalized gate revenue (the ratio of each club's total gate revenue to the MLB mean gate revenue for each year  $t$ ) player  $i$ 's year  $t$  club in year  $t$ .

*GATE<sub>it+1</sub>*: The normalized gate revenue of player  $i$ 's year  $t+1$  club in year  $t$ .

*TEAMS<sub>t</sub>*: The total number of MLB clubs in each observation year. (1990-92,  $n = 26$ ; 1993-97,  $n = 28$ ; 1998-2005,  $n = 30$ ). An increase in the number of clubs potentially increases the pool of potential trading partners.

*NL<sub>t</sub>*: A binomial dummy variable coded 1 for player-year observations on National League clubs in year  $t$  and 0 for American League clubs. A significant rule difference, potentially affecting

talent flows, is that American League clubs employ a designated hitter. The expectation is that this may increase the flow of older talent, or those otherwise less able to play a fielding position away from NL clubs.

*90-96BA*: A dummy variable representing the sample years not effected by progressive revenue sharing. The years 1990-1996 are coded 1, and coded 0 otherwise.

*1997BA*: A dummy variable capturing the effects of the 1997 Basic Agreement. The years 1997-2002 are coded 1, and coded 0 otherwise.

*2003BA*: A dummy variable capturing the effects of the 2003 Basic Agreement. The years 2003-2005 are coded 1, and coded 0 otherwise.

*e*: disturbance term  $E(e) = 0$  and  $\text{Var}(e) = \sigma_e^2$ .

The 2005 player year observations include a *TRANSFER* code for players based on their club assignment for the 2006 season. Therefore, all between-season trading and signing periods covered by the 2003BA are included.

To isolate the specific effects of each progressive revenue plan on talent flows, a LOGIT equation incorporating interaction is constructed.

$$(9) \quad \begin{aligned} \text{TRANSFER}_{it} = & \beta_0 + \beta_1 \text{FA} + \beta_2 \text{PRESWITCH}_{it} + \beta_3 \text{PROD}_{it} + \beta_4 \text{NL}_t + \\ & \beta_5 \text{TEAMS}_t + \beta_6 90-96\text{BA} * \text{WIN}_{it} + \beta_7 1997\text{BA} * \text{WIN}_{it} + \\ & \beta_8 2003\text{BA} * \text{WIN}_{it} + \beta_9 90-96\text{BA} * \text{WIN}_{it+1} + \beta_{10} 1997\text{BA} * \text{WIN}_{it+1} + \\ & \beta_{11} 2003\text{BA} * \text{WIN}_{it+1} + \beta_{12} 90-96\text{BA} * \text{GATE}_{it} + \beta_{13} 1997\text{BA} * \text{GATE}_{it} + \\ & \beta_{14} 2003\text{BA} * \text{GATE}_{it} + \beta_{15} 90-96\text{BA} * \text{GATE}_{it+1} + \beta_{16} 1997\text{BA} * \text{GATE}_{it+1} + \\ & \beta_{17} 2003\text{BA} * \text{GATE}_{it+1} + e_{it}. \end{aligned}$$

The variables corresponding to  $\beta_6$  —  $\beta_{17}$  replace the variables *WIN* and *GATE* with interaction variables created as the product of each *WIN* and *GATE* and the binomial value representing each of the three collective bargaining periods. Negative coefficient estimates for

$GATE_{it}$  indicate the probability of transfer increases for players on lower revenue clubs; and negative coefficient estimates for  $GATE_{it+1}$  indicate the probability of transfer decreases for players moving toward lower revenue clubs. Should the interaction terms corresponding to each progressive revenue sharing period reveal greater coefficient estimates, there is substantiation that progressive revenue sharing has amplified the large market dominance/small market failure dimension of competitive balance. Summary statistics for the all years, and separately for each collective bargaining period, are reported in Table 3.

**(INSERT TABLE 3 ABOUT HERE)**

The summary statistics show that transfer rates increased significantly with each successive collective bargaining period. Statistics are shown for the full sample, and for players in the top performance quartile each season, as determined by a simple sum of their plate appearances and slugging average (multiplied by 1,000). The top quartile of productive players have lower transfer rates, but clearly this group also reflects the trend of increased transfers since the implementation of the 2003BA. Also of note, when comparing each period, are the significant variation in the mean performance variables. Performance averages increased significantly for all groups during the 1997BA period. The 2003BA period shows a modest decline in slugging average for the top quartile in comparison to the 1997BA period, but averages continue to exceed the years before progressive revenue sharing. Variation in the win percent statistics show that on average players transfer to lesser clubs, except during the 1997BA. The gate revenue statistics shows that players transfer to clubs with greater revenue. This trend is significantly amplified for both groupings of players with the 2003BA.

The LOGIT regression estimates for model one are reported in Tables 4. The coefficient estimates are adjusted for heteroskedasticity. Given that summary statistics reveal considerably more variation in production and  $GATE$ , between collective bargaining periods, the assumption

is logical. Although the adjustments do not always yield statistically significant results, each equation reflects the correction.

**(INSERT TABLE 4 ABOUT HERE)**

The regression results are consistent with the *a priori* predictions. Free agents and players that have previously changed clubs are significantly more likely to transfer. Lower levels of performance indicate a greater likelihood of transfer. The results imply that players transfer away from NL clubs and provide tepid evidence that players are more likely to transfer with the addition of more clubs. The regression coefficient estimates for *WIN* indicate that players are more likely to transfer from clubs with higher, to clubs with lower, win percentages and this is most evident for the most productive quartile. The estimates for *GATE* indicate that all groupings of players are more likely to transfer from clubs with lower, to clubs with and higher, gate revenues. Both results are consistent with an MRP explanation motivating transfers. Positive coefficient values are consistent for 1997BA and 2003BA indicating that, all else constant, the probability of transfer has increased with the implementation of progressive revenue sharing, most visibly for productive players, since the implementation of the 2003 BA.

Model 2 estimates, which include the interaction terms, are shown in Table 5, and reveal more definitive conclusions about the effects of progressive revenue sharing on talent flows. First, the movement from higher to lower win percent clubs is amplified considerably with the 2003BA. This in context with the deviation in the *GATE* coefficient estimates indicates a categorical alteration of talent flows. Most importantly, the lower club revenue, the more likely top quartile players are to transfer from that club, in both periods of progressive revenue sharing. Prior to 1997, there is no indication that the gate revenue of the player's current team affected likelihood of transfer. Furthermore, for the entire set of observations, and those in the top

quartile, the probability of transfer toward higher gate revenue clubs, indicated by  $GATE_{it+1}$ , increased significantly with the 1997BA. The moderation of this trend consistent with the 2003BA suggests the reformulated luxury tax of that collective bargaining agreement was effective. Although the results in Table 5 indicate a definitive alteration of talent flows, there is no particular explanation for the overall increase in transfer rates. Nonetheless, revealed is a primary piece of evidence to support the hypothesis that progressive revenue sharing has altered talent flows in such a way that competitive balance is adversely affected. Since the implementation of progressive revenue sharing, the most productive talent is more likely to flow away from lower revenue producing clubs and toward higher revenue producing clubs. Whereas, prior to 1997, revenue differences between clubs involved in the transfer of a player was not a significant factor.

The above analysis indicates a significant alteration in the talent movement given the changes brought about by progressive revenue sharing. Notwithstanding, isolation of the effects on the lowest revenue producing clubs is in need of further corroboration. Clubs in the lowest revenue quartile are argued to have the greatest incentive to reduce their level of talent procurement. For the purpose of isolating these groups, the sample was restricted to transfer observations only, and dependent variables are developed to indicate the player has transferred either to or from revenue quartile four. The dependent variable indicates, that given a player has transferred, the probability of transfer to or from a quartile four team.

$$(10) \text{REVQ}_{n_t} = \beta_0 + \beta_1 \text{FA} + \beta_2 \text{PRESWITCH}_{it} + \beta_3 \text{PROD}_{it} + \beta_4 \text{NL}_t + \beta_5 \text{TEAMS}_t + \beta_6 \text{1997BA} \\ + \beta_7 \text{2003BA} + \beta_8 \text{WIN}_{it} + \beta_9 \text{WIN}_{it+1} + \beta_{10} \text{GATE}_{it} + \beta_{11} \text{GATE}_{it+1} + e.$$

Where  $\text{REVQ}_{n_t}$  is defined as, respectively:

*REVQ4<sub>t</sub>*: A dummy variable coded 1 for clubs in the bottom total revenue generating quartile for the observation year (the lowest six revenue producers in 1990-92 and the lowest seven 1993-2005) 0 otherwise. The variable indicates that the player transferred from a quartile four club.

*REVQ4<sub>t+1</sub>*: A dummy variable coded 1 for the player's *t+1* club when in the bottom revenue generating quartile for the observation year *t*. 0 otherwise. The variable indicates that the player transferred to a quartile four club.

Estimates for these models for all transfer observations and observations for players in the top two performance quartiles are shown in Tables 6A and 6B.

**(INSERT TABLE 6A & 6B ABOUT HERE)**

The results provide discernible support for the hypothesis. Table 6A clearly indicates that since progressive revenue sharing, players that transfer are significantly less likely to move to quartile four clubs. Table 6B presents a conundrum. Since to progressive revenue sharing, transferring players are significantly less likely to leave quartile four clubs, although the difference waned somewhat since the 2003BA. Perhaps this indicates that quartile four clubs have increasingly fewer players of value to higher revenue clubs. The combination of slowed movements both toward and away low gate revenue clubs indicates less participation in the inter-season labor market relative to other clubs, even as overall market activity has increased over time. This is consistent with the hypothesis that the progressive revenue sharing has created an incentive for low revenue clubs to divest their talent. Taken as a whole, the results provide considerable support that the provisions of progressive revenue sharing have clearly altered the incentives in regard talent procurement for low revenue producers. A corresponding, increase in payroll dispersion and competitive imbalance over this period provides support for the hypothesis that the changes were not as intended, by those hoping for an improvement in

competitive balance. There is evidence that progressive revenue sharing created a disincentive to win for low revenue producing clubs.

## **5. Conclusions and Suggestions for Further Research**

The results imply that flow of talent is significantly altered with progressive revenue sharing. The outcome is a mildly adverse effect on overall competitive balance when compared to the immediately preceding years. The analysis also presents some challenges. The revenue dispersion statistics show growing imbalance in gate revenue and improved variation in total revenue, yet only after redistribution. This brings about additional questions about the relationship between club revenue sources, incentives to win, and payroll.

Logically the revenue elasticity to winning varies considerably across revenue sources. Gate revenue is theoretically highly winning-elastic. Local broadcast revenue, given long-term contracts, is expected to be less elastic. Given profit-maximizing assumptions about owners, revenue from central sources should be unrelated to winning or perhaps, as has been shown here, inversely related to winning. Rigorous analysis of the connection between the effect of winning and the associated incentives toward talent procurement on the various revenue streams and the correlation between those revenue streams and payroll may yield better-informed conclusions about the effects of both in-place and proposed revenue sharing plans.

Additionally much analysis of sports leagues has had an implicit single period orientation. The puzzles of why low revenue clubs actually increase their payroll, why some middle to high revenue clubs—Cleveland and Baltimore during the studied time period for example—periodically make significant payroll reductions. Furthermore, the effects of the luxury tax may be better understood given a multi-period analysis. Intra-season transfers, not evaluated here, theoretically imply that clubs have routinely shown a willingness to trade present



wins for future wins. It is likely that the progressive subsidies have increased the opportunity cost of present wins for some clubs. Perhaps low revenue clubs took the opportunity to divest and collect a large subsidy, which is reinvested by developing young talent for the future. Low revenue clubs such as Minnesota, and Florida, showed considerably improved on-field performance, since the 2001 season. Others, such as Kansas City and Tampa Bay, wallowed at the bottom of payroll rankings and the standings throughout the progressive sharing era. Analysis of talent flows over time by club, and the relationship to winning and various revenue streams, may shed additional light on these issues.

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## 7. Tables

**TABLE 1**

**Coefficient of Variation**

<b>Year</b>	<b>Payroll</b>	<b>Total Revenue</b>	<b>Gate Revenue</b>
1990	0.222	0.304	0.374
1991	0.252	0.289	0.367
1992	0.304	0.281	0.364
1993	0.304	0.256	0.333
1994	0.263	0.292	0.339
1995	0.278	0.387	0.417
1996	0.314	0.300*	0.477
1997	0.339	0.334*	0.525
1998	0.375	0.327*	0.528
1999	0.445	0.329*	0.530
2000	0.393	0.292*	0.525
2001	0.379	0.296*	0.491
2002	0.366	0.291*	0.558
2003	0.396	0.248*	0.578
2004	0.475	0.254*	0.619
2005	0.469	0.210*	0.546
<b>90-2005</b>	0.348	0.293	0.475
<b>90-96</b>	0.277	0.301	0.382
<b>97-05</b>	0.404 <sup>a</sup>	0.281	0.544 <sup>a</sup>
<b>(T Value Difference)</b>	-6.27	-0.694	-7.19

\* After redistribution of pooled revenues, a significant at the .01 level

**TABLE 2**

**Competitive Balance Measures**

<b>Year</b>	<b>Standard Deviation of Win Percent</b>			<b>Spearman's Rank Coefficient</b>		
	<b>AL</b>	<b>NL</b>	<b>MLB</b>	<b>AL</b>	<b>NL</b>	<b>MLB</b>
1990	0.057	0.057	0.057	0.171	-0.059	0.065
1991	0.061	0.061	0.061	0.468	-0.374	0.079
1992	0.063	0.066	0.064	0.369	0.157	0.271
1993	0.055	0.093	0.073	-0.020	0.112	0.046
1994	0.068	0.072	0.058	0.527	0.475	0.501
1995	0.083	0.060	0.071	0.189	0.431	0.310
1996	0.069	0.056	0.062	0.673	0.429	0.551
1997	0.062	0.058	0.06	0.490	0.136	0.313
1998	0.081	0.088	0.085	0.234	0.440	0.343
1999	0.076	0.079	0.077	0.835	0.531	0.673
2000	0.054	0.069	0.061	0.512	0.543	0.528
2001	0.095	0.065	0.08	0.714	0.462	0.580
2002	0.106	0.081	0.091	0.732	0.810	0.774
2003	0.098	0.070	0.083	0.835	0.653	0.738
2004	0.083	0.086	0.083	0.415	0.697	0.566
2005	0.081	0.055	0.067	0.789	0.609	0.693
<b>90-2005</b>	<b>0.074</b>	<b>0.070</b>	<b>0.071</b>	<b>0.496</b>	<b>0.378</b>	<b>0.439</b>
<b>90-96</b>	<b>0.065</b>	<b>0.066</b>	<b>0.064</b>	<b>0.340</b>	<b>0.167</b>	<b>0.260</b>
<b>97-05</b>	<b>0.082</b>	<b>0.072</b>	<b>0.076</b>	<b>0.617</b>	<b>0.542</b>	<b>0.579</b>
<b>t-value*</b>	<b>-2.32<sup>b</sup></b>	<b>-0.95</b>	<b>-2.69<sup>a</sup></b>	<b>-2.46<sup>b</sup></b>	<b>-2.97<sup>a</sup></b>	<b>-3.43<sup>a</sup></b>

\*Difference in means before and after progressive revenue sharing  
a significant at the 0.01 level, b significant at the 0.05 level,

**TABLE 3**  
**Summary Statistics**

	<b>1990-2005</b>				<b>1990-1996</b>			
	<b>Full Sample</b>		<b>Quartile 1</b>		<b>Full Sample</b>		<b>Quartile 1</b>	
	6935		1745		2920		738	
	Observations	Observations	Observations	Observations	Mean	SD	Mean	SD
<i>TRANSFER</i>	0.258	0.438	0.160	0.367	0.231	0.421	0.150	0.358
<i>FA</i>	0.183	0.387	0.127	0.333	0.180	0.384	0.134	0.341
<i>PRESWITCH</i>	0.498	0.500	0.485	0.500	0.446	0.497	0.427	0.495
<i>SA</i>	0.406	0.093	0.485	0.074	0.393	0.092	0.469	0.071
<i>PA</i>	366.7	212.9	632.5	67.2	357.7	209.8	619.5	69.1
<i>NL</i>	0.509	0.500	0.472	0.499	0.487	0.500	0.442	0.497
<i>TEAMS</i>	28.7	1.517	28.7	1.5	27.2	0.99	27.2	0.99
<i>WIN<sub>it</sub></i>	0.499	0.071	0.513	0.069	0.499	0.063	0.509	0.065
<i>WIN<sub>it+1</sub></i>	0.498	0.071	0.512	0.069	0.498	0.064	0.508	0.064
<i>GATE<sub>it</sub></i>	0.998	0.470	1.061	0.511	0.998	0.378	1.051	0.404
<i>GATE<sub>it+1</sub></i>	1.001	0.473	1.075	0.511	0.999	0.376	1.051	0.404
	<b>1997-2002</b>				<b>2003-2005</b>			
	<b>Full Sample</b>		<b>Quartile 1</b>		<b>Full Sample</b>		<b>Quartile 1</b>	
	2692		674		1323		333	
	Observations	Observations	Observations	Observations	Mean	SD	Mean	SD
<i>TRANSFER</i>	0.262	0.440	0.147	0.354	0.310	0.463	0.210	0.408
<i>FA</i>	0.168	0.374	0.111	0.315	0.219	0.414	0.141	0.349
<i>PRESWITCH</i>	0.532	0.499	0.521	0.500	0.542	0.498	0.541	0.499
<i>SA</i>	0.415	0.094	0.499	0.077	0.416	0.089	0.491	0.067
<i>PA</i>	370.1	214.9	640.9	65.6	379.6	214.7	644.2	61.20
<i>NL</i>	0.525	0.499	0.493	0.500	0.526	0.500	0.498	0.501
<i>TEAMS</i>	29.7	0.73	29.7	0.73	30	0.00	30	0.00
<i>WIN<sub>it</sub></i>	0.499	0.076	0.515	0.073	0.499	0.076	0.520	0.070
<i>WIN<sub>it+1</sub></i>	0.499	0.075	0.515	0.073	0.496	0.078	0.514	0.074
<i>GATE<sub>it</sub></i>	0.999	0.515	1.057	0.540	0.997	0.550	1.092	0.644
<i>GATE<sub>it+1</sub></i>	1.005	0.517	1.077	0.538	0.999	0.563	1.122	0.648

**TABLE 4**  
**Dependent Variable: TRANSFER**

	Full sample: N=6935		Quartile 1: N=1745	
	Coefficient	P-Value	Coefficient	P-Value
<i>Constant</i>	-1.258	0.263	-1.619	0.562
<i>FA</i>	2.460 <sup>a</sup>	0.000	3.230 <sup>a</sup>	0.000
<i>PRESWITCH</i>	0.554 <sup>a</sup>	0.000	0.336 <sup>b</sup>	0.035
<i>SA</i>	-4.018 <sup>a</sup>	0.000	-3.041 <sup>b</sup>	0.019
<i>PA</i>	-0.0004 <sup>b</sup>	0.035	0.000	0.761
<i>NL</i>	0.119 <sup>c</sup>	0.061	0.171	0.279
<i>TEAMS</i>	0.046	0.255	0.068	0.501
<i>1997BA</i>	0.263 <sup>b</sup>	0.038	0.196	0.502
<i>2003BA</i>	0.399 <sup>a</sup>	0.006	0.782 <sup>b</sup>	0.016
<i>WIN<sub>it</sub></i>	0.348	0.506	3.044 <sup>b</sup>	0.018
<i>WIN<sub>it+1</sub></i>	-1.481 <sup>a</sup>	0.004	-7.018 <sup>a</sup>	0.000
<i>GATE<sub>it</sub></i>	-0.112	0.147	-1.028 <sup>a</sup>	0.000
<i>GATE<sub>it+1</sub></i>	0.188 <sup>b</sup>	0.015	1.188 <sup>a</sup>	0.000
<b>Heteroskadsticity Correction</b>				
<i>Year=97-02</i>	-0.070	0.223	-0.164	0.126
<i>Year=03-05</i>	-0.105	0.121	-0.413 <sup>a</sup>	0.001
<b>McFadden (Pseudo R<sup>2</sup>)</b>		0.242		0.356

a significant at the 0.01 level, b significant at the 0.05 level, c significant at the 0.1 level

**TABLE 5**  
**Dependent Variable: TRANSFER**

	Full sample: N=6935		Quartile 1: N=1745	
	Coefficient	P-Value	Coefficient	P-Value
<i>Constant</i>	-0.810	0.494	-0.161	0.957
<i>FA</i>	2.469 <sup>a</sup>	0.000	3.138 <sup>a</sup>	0.000
<i>PRESWITCH</i>	0.554 <sup>a</sup>	0.000	0.322 <sup>b</sup>	0.039
<i>SA</i>	-4.046 <sup>a</sup>	0.000	-2.624 <sup>b</sup>	0.042
<i>PA</i>	-0.0004 <sup>b</sup>	0.033	0.0002	0.881
<i>NL</i>	0.122 <sup>c</sup>	0.057	0.179	0.242
<i>TEAMS</i>	0.038	0.341	0.024	0.814
<i>90BA*WIN<sub>it</sub></i>	0.017	0.983	2.655	0.252
<i>97BA*WIN<sub>it</sub></i>	-0.425	0.543	1.037	0.532
<i>03BA*WIN<sub>it</sub></i>	2.055 <sup>b</sup>	0.032	7.968 <sup>a</sup>	0.000
<i>90BA*WIN<sub>it+1</sub></i>	-1.201	0.133	-8.130 <sup>a</sup>	0.001
<i>97BA*WIN<sub>it+1</sub></i>	-1.049	0.130	-5.330 <sup>a</sup>	0.003
<i>03BA*WIN<sub>it+1</sub></i>	-2.410 <sup>b</sup>	0.011	-9.552 <sup>a</sup>	0.000
<i>90BA*GATE<sub>it</sub></i>	-0.077	0.608	-0.206	0.528
<i>97BA*GATE<sub>it</sub></i>	-0.058	0.619	-1.298 <sup>a</sup>	0.000
<i>03BA*GATE<sub>it</sub></i>	-0.276 <sup>c</sup>	0.055	-1.233 <sup>a</sup>	0.000
<i>90BA*GATE<sub>it+1</sub></i>	-0.059	0.713	0.742 <sup>b</sup>	0.033
<i>97BA*GATE<sub>it+1</sub></i>	0.345 <sup>a</sup>	0.003	1.685 <sup>a</sup>	0.000
<i>03BA*GATE<sub>it+1</sub></i>	0.160	0.257	0.920 <sup>a</sup>	0.003
<b>Heteroskadsticity Correction</b>				
<i>Year=97-02</i>	-0.064	0.271	-0.243 <sup>b</sup>	0.039
<i>Year=03-05</i>	-0.109	0.108	-0.550 <sup>a</sup>	0.000
<b>McFadden (Pseudo R<sup>2</sup>)</b>		0.243		0.369

a significant at the 0.01 level, b significant at the 0.05 level, c significant at the 0.1 level

**TABLE 6A**  
**Revenue Quartile Models for**  
**Dependent Variable: Transfers to Quartile 4**

	Full sample		Performance Quartiles 1&2	
	Coefficient	P- Value	Coefficient	P- Value
<i>Constant</i>	6.992 <sup>a</sup>	0.002	15.567 <sup>a</sup>	0.000
<i>FA</i>	-0.004	0.970	-0.114	0.626
<i>PRESWITCH</i>	-0.006	0.963	-0.015	0.953
<i>SA</i>	-0.417	0.581	-1.438	0.480
<i>PA</i>	-0.0003	0.390	-0.0004	0.660
<i>NL</i>	-0.043	0.698	-0.120	0.573
<i>TEAMS</i>	-0.041	0.584	-0.273 <sup>c</sup>	0.068
<i>1997BA</i>	-1.120 <sup>a</sup>	0.000	-0.808 <sup>c</sup>	0.075
<i>2003BA</i>	-0.754 <sup>b</sup>	0.012	-0.320	0.540
<i>WIN<sub>tit</sub></i>	0.670	0.474	-0.923	0.569
<i>WIN<sub>tit+1</sub></i>	1.085	0.187	1.387	0.351
<i>GATE<sub>tit</sub></i>	-0.170	0.235	0.001	0.998
<i>GATE<sub>tit+1</sub></i>	-9.371 <sup>a</sup>	0.000	-11.11 <sup>a</sup>	0.000
Heteroskadsticity Correction				
<i>Year=97-02</i>	-1.029 <sup>a</sup>	0.000	-0.973399 <sup>a</sup>	0.000
<i>Year=03-05</i>	-0.734 <sup>a</sup>	0.001	-1.01847 <sup>c</sup>	0.067
<b>McFadden (Pseudo R<sup>2</sup>)</b>		0.613		0.658

a significant at the 0.01 level, b significant at the 0.05 level, c significant at the 0.1 level



**TABLE 6B**  
**Revenue Quartile Models for**  
**Dependent Variable: Transfers from Quartile 4**

	Full sample: N = 1790		Performance Quartiles 1&2 N = 715	
	Coefficient	P-Value	Coefficient	P-Value
<i>Constant</i>	15.43 <sup>a</sup>	0.000	19.81 <sup>a</sup>	0.003
<i>FA</i>	0.163	0.405	0.166	0.613
<i>PRESWITCH</i>	-0.166	0.451	-0.108	0.758
<i>SA</i>	0.265	0.818	-2.703	0.291
<i>PA</i>	0.0004	0.457	0.0004	0.799
<i>NL</i>	-0.741 <sup>a</sup>	0.001	-0.787 <sup>b</sup>	0.028
<i>TEAMS</i>	-0.269 <sup>b</sup>	0.026	-0.348 <sup>c</sup>	0.083
<i>1997BA</i>	-1.021 <sup>a</sup>	0.009	-0.906	0.137
<i>2003BA</i>	-0.626	0.132	-0.508	0.444
<i>WIN<sub>tit</sub></i>	1.869	0.225	-2.204	0.451
<i>WIN<sub>tit+1</sub></i>	0.801	0.579	3.491	0.111
<i>GATE<sub>tit</sub></i>	-13.54 <sup>a</sup>	0.000	-14.12 <sup>a</sup>	0.000
<i>GATE<sub>tit+1</sub></i>	-0.001	0.998	0.130	0.750
Heteroskadsticity Correction				
<b>Year=97-02</b>	0.147 <sup>c</sup>	0.075	0.149	0.352
<b>Year=03-05</b>	-0.279	0.139	-0.291	0.328
McFadden (Pseudo R <sup>2</sup> )		0.576		0.602

a significant at the 0.01 level, b significant at the 0.05 level, c significant at the 0.1 level