PROPERTY RIGHT REGIMES IN JAPANESE BASEBALL: A NEW LOOK AT THE ROTTENBERG INVARIANCE PROPOSITION

by

Sumner J. La Croix and Akihiko Kawaura*

Working Paper No. 93-15
July 16, 1993

ABSTRACT

We examine the 1965 change from an open-bidding to a draft system for new players in Japan's professional baseball leagues. Our theoretical analysis, which incorporates two factors commonly observed in professional sports, imperfect information on new recruits and outlier, highly skilled players, calls into question the magnitude of the changes that would be expected upon changing the rule structure for recruiting new players. Our empirical finds results that are strikingly similar to results from U.S. data. One baseball league in each country (the Central in Japan, the American in U.S.) possessed a dominant team (the Giants in Japan, the Yankees in the U.S.) under the open-bidding system, while the other league (the Pacific in Japan, the National in the U.S.) had substantially more equality. After the 1965 rule change in both countries, the leagues previously with a dominant team become substantially more competitive. In the other more competitive league, there is less change. The similarity of the effects generated across cultures and countries from the rule changes shows the important of the structure of property rights in any competitive framework.

*Professor, Department of Economics, University of Hawaii, Honolulu, Hawaii 96822 and Fellow, Program on International Economics and Politics, East-West Center, Honolulu, Hawaii 96848; and Economist, the World Bank, 1818 H Street, N.W., Washington, D.C. 20433. The findings, interpretations, and conclusions are only those of the authors and should not be attributed to the World Bank, its Board of Governors, its staff, or members countries.

I. Introduction

In his classic 1956 article, Simon Rottenberg anticipated Ronald Coase's famous theorem on social cost. Rottenberg analyzed the impact of baseball's reserve clause on the allocation of baseball players to professional baseball teams. He argued that the reserve clause, which grants to one team "the exclusive and saleable right to employ a player's professional services", did not affect the allocation of players among teams but only the distribution of rents stemming from the players' services.[1] Under the reserve clause, if a baseball player generates his highest marginal product with a second team, the player's team would have incentives to exchange the player (for cash and/or other players) with the second team. Without a reserve clause, the team with which the player generates the highest marginal product offers the highest salary to the player, thereby obtaining his services.[2] Under both scenarios, the player is efficiently allocated among teams. A similar analysis applies to the rules for allocating new baseball players among teams. If a player draft assigns the player to one team and the player could generate a higher marginal product with another team, the two teams have incentives to make an exchange. The allocation of players under a player draft should, therefore, be the same as the allocation of players under an open bidding system which allows players to sign with the team presenting the highest offer.

George Daly and William Moore (1981) and Daly (1992) have observed that while Rottenberg's theoretical analysis is correct, it does not correspond with the rule structure for player allocation in U.S. major league baseball. They argue that since World War II there has been an unwritten rule banning all proposed exchanges of star players or prospects for cash; they could not identify a single violation of this implicit rule.[3] In 1976 the proposed sale of several star players by the Oakland Athletics was voided by Commissioner Bowie Kuhn.[4] If teams are not allowed to exchange players for cash, then the system of allocating new players to teams could affect the ultimate allocation of players across teams, as there exists no effective mechanism for one team to transfer a player to a second team and receive compensation for the player.[5] Daly and Moore use the 1965 change in U.S. professional baseball from an open bidding system to a draft system to compare player allocation

under two different rule structures. Under an open bidding system, the best new players sign with teams located in large cities where the value of their marginal product is likely to be highest. Teams from the largest cities (or metropolitan areas) should, therefore, dominate the baseball standings in an open bidding system. Under a draft system, the best players are likely to be more evenly allocated across teams. Thus, teams from the largest cities are less likely to dominate league standings. Daly and Moore use pre- and post-1965 performance data from the American and National Leagues to test this hypothesis. After 1965 they find substantially less dominance in the American League and somewhat less dominance in the National League.

While Daly and Moore's tests are generally well designed, their empirical implementation has limited power for three central reasons. First, in 1961, 1962, and 1969, the number of teams in each league expanded. Moreover, in 1969 each league split into two divisions of six teams each. These changes make comparisons between pre- and post-1965 team performance more difficult to measure and to interpret. Second, the implementation of the draft in 1965 did not immediately affect the distribution of talent among teams. Most new players need 2-4 years of play in minor league baseball before they have acquired sufficient skills to be competitive in major league baseball. Skill acquisition continues in the major leagues where player productivity usually increases during the early years of a good player's career. Daly and Moore's empirical tests do not recognize this vintage effect--they assume that the 1965 player draft had an immediate effect on team performance in 1966.[6] Finally, the number of observations from the player draft is limited to 1966-1974, as surprise decisions by salary arbitrators forced teams to adopt in 1976 a free-agent system which allowed most star players to sign immediately with another team. If we discard the 1966-69 or 1966-70 observations to reflect the transition between the two player allocation systems, only four or five years remain in the post-1965 sample, too few to draw any substantive conclusions on the impact of the change from open bidding to a player draft.

In this paper we examine the same institutional change, from an open bidding to a draft system, in Japan's professional baseball leagues. Japanese data has several advantages over U.S. data.

First, the number of teams in each league (six per league) remains constant over the entire sample period, 1958-1991. Second, neither Japanese league has used divisional play. Finally, Japanese players are still bound by the reserve clause. Thus the overall system of player allocation has not changed since the implementation of the new player draft in 1965. The post-draft sample is sufficiently large that empirical analysis can incorporate an adjustment period reflecting the transition between the player allocation systems. In sum, the Japanese data enables us to conduct a "cleaner" test of performance differences stemming from the change in player allocation rules than U.S. data.

Our paper examines how the 1965 change in the system of allocating new baseball players to professional baseball teams in Japan affected team performance. The analysis begins with a brief history of Japanese professional baseball (Section II) and a discussion of the change from the open bid to the draft system of new player allocation to professional teams (Section III). Next we discuss the theoretical impact of the change in the player allocation system on team performance (Section IV) and measure the draft's impact using a variety of team performance measures (Section V). Finally (Section VI), we summarize and compare our results with Daly and Moore's U.S. results.

II. A Brief History of Japanese Baseball

The first Japanese professional baseball team, the Yomiuri Giants, was officially established on December 26, 1934. It was financially sponsored by the Yomiuri Newspapers, whose president, Mr. Matsutaro Shoriki, was an ardent promoter of the formation of a professional baseball league in Japan. In spite of the Giants' debut in late 1934, it was not until 1936 that a professional league, later known as the Japanese Professional Baseball League (JPBL), began to play actively. After a series of tournament games were played in 1936 among seven teams from Tokyo, Osaka, and Nagoya, the first pennant race took place in 1937, with eight teams competing in a split-season format.

After two years of split seasons, in which each team competed by playing between 35 to 56 games in separate spring and fall pennant races, the league adopted a single-season system for its nine teams beginning in 1939. The Giants won five consecutive championships before the 1944 pennant race was called in midseason due to World War II. In April, 1946, less than one year after the end of

the war, professional baseball resumed play.

In 1950 the JPBL split into two leagues: the Pacific League with seven teams and the Central League (the original JPBL) with eight teams.[7] The two league system prompted by the split led to the start of the Japan Series in which the pennant winners in each league engaged in a best-of-seven series to decide the championship team. After a gradual reorganization in the mid-1950s, the number of teams in each league was fixed at six in 1958. While several teams have relocated to different cities, e.g. the Nankai Hawks, an Osaka-based franchise, moved to Fukuoka in 1988, the number of teams in each league has remained constant. Most baseball teams are owned by major corporations. The 130-game season begins in early April and ends in late September. Unlike American baseball, tie games are permitted and count in the standings. Like American baseball, one league (Pacific) uses the designated hitter rule while the other league (Central) does not. Japanese baseball uses the American rulebook in translation. Perhaps the main differences between the two games are Japan's all-dirt infields, a wider Japanese strike zone, and marginally smaller Japanese baseballs.

The Pacific League was not as popular with fans as the Central League, at least partly because the immensely popular Giants played in the Central League. In a desperate effort to increase their popularity among baseball fans, the Pacific League adopted a split-season format in 1973. The winner of the first and second halves of the season competed in a play-off to determine the Pacific League's pennant winner who would then represent the Pacific League in the Japan Series. The Pacific League reverted back to a single-season pennant race in 1983.

A distinct feature of Japanese professional baseball teams is that they are concentrated in a few big cities. The original seven teams formed in 1936 were all based in Tokyo, Osaka, and Nagoya. The locational distribution of professional teams in 1993 remains roughly the same as the earlier distribution. Out of twelve professional teams, six are based in the Tokyo area and three in the Osaka-Kobe area. No team has ever been located outside of 5 major metropolitan areas--Tokyo (including Yokohama), Osaka-Kobe, Nagoya, Hiroshima, and Fukuoka.

III. From Open Bid to Draft Allocation of Players

Since the establishment of the professional league in 1934, individual teams were free to compete for promising prospects and existing players. In June, 1951 the JPBL issued the first league rule which granted to each team the exclusive right to negotiate future contracts with players already under contract, i.e., established the player reserve clause in Japanese baseball. Free competition for new players continued until the introduction of the draft recruit system in 1965. In July, 1964 the owners of the Pacific League teams unanimously agreed that the draft recruit system should be introduced. The Giants and Tigers of the Central League strongly resisted this change, but the proposal was nonetheless adopted by both leagues.

The first draft conference was held on November 17, 1965. Drafts are now held once per year in the Commissioner's Office in mid-November. The order of team selection in the draft is random, unlike in the United States where teams draft in the reserve order of their finish during the previous year. The order of team selection inverts in each succeeding round, i.e., the team with the first pick in the first round picks last in the second round, while the team with the last pick in the first round picks first in the second round. Most drafts run five to six rounds. Teams sign most draftees. A player cannot be drafted until he graduates from high school. Signing bonuses to new recruits are automatically set by the league and decline as the round in which the player is selected increases.

There were several factors behind the switch from open bidding to the draft recruit system. First, the draft system was also introduced in 1965 by U.S. major league baseball, and Japanese professional baseball may have emulated the change in the United States. Second, free competition through bidding for new players had led to increasing contract bonuses and salaries for rookies. As Rottenberg demonstrated, this arrangement leaves a large portion of the rents from the services of a baseball player with the baseball player. The switch to the draft system would enable the baseball team to appropriate more of the rents from a player's services. Finally, there was the concern that the process of free competition for promising young players would maintain the dominance of several already strong teams and that such dominance could ultimately undermine the popularity of

of average quality within a few years, then this team will be capable of dominating league play over the life of the dominant player.[9] Under an open bidding system, the dominant player signs with the big city team. Since the big city team has already accumulated an above average team, the presence of the dominant player is likely to produce a very dominant team. The main difference between the two allocation systems is that under open bidding, the dominant team is the big city team whereas under the draft allocation system, the dominant team is randomly selected from the league's 12 teams. Thus relaxing the second assumption maintains the Daly and Moore result for the open bidding system, but alters their result for the draft recruit system.

The above analysis leaves open the possibility that in a world with imperfect information on new recruits and with infrequently occurring highly skilled players, the differences between the two allocation systems become less severe. An open bidding system for new recruits may produce substantial equality over time if teams in large cities make frequent mistakes in signing new recruits. If outlier, highly skilled players exist, then any mistakes by big city teams in evaluating or signing these players can produce dominance by a small city team which acquires an outlier player either by superior evaluation skills or by the luck of the draw.

Introduction of imperfect information and dominant players into the analysis of the two recruit systems alters the change in team performances that we could expect after the 1965 switch to a draft recruit system. We should not be surprised if there is substantial equality under the open bidding system or if there is a dominant team under the draft recruit system. Unless, however, one of these two factors is particularly important, the change to the draft recruit system should produce a move toward more equality in performance over time.

We should note again the major difference between the draft system in the United States and Japan. In Japan, teams draft players in the first round in random order, while in the U.S., teams draft in the reverse order of their previous year's finish in the standings. If teams are able to predict players' skills relatively accurately, then the draft should produce a greater tendency toward short-run equality in the U.S. than in Japan, as the U.S. draft systematically awards better players to teams with

bad records.[10] In Japan the draft awards players to teams randomly, and team performances should, therefore, also be random in the long run, assuming teams have equal capabilities in evaluating new players. Teams with poor records have, however, less ability to add the best talent in the short run and to catch up with teams with good records. The Japanese draft may, therefore lead to longer stretches of team dominance than the American draft system.

V. The Effect of the Draft on Team Performance and Behavior

We conduct three empirical tests to determine whether the switch to the draft in 1965 altered the behavior and performance of Japan's major league teams. First, we investigate whether the number of player transfers increased after the draft was implemented. Does the player draft with its more random allocation of players across teams lead to more initial misallocations that are later corrected by player transfers? Second, we investigate whether the draft led to more or less dominance in winning pennants by one team or a few teams within each league. Third, we investigate whether teams moved up and down in the standings over time more often after the draft was instituted.

Table 1 presents data on the number of trades in each year during the two regimes. The number of trades per year is normalized to reflect changes in the allowed number of players on each team's roster. Team rosters include both major and minor league players. The average number of trades per 100 players increases from 3.04 in the 1958-1965 period to 4.35 in the 1966-1992 period. A t-test reveals that the difference in means is significant at the x percent level. This result differs from similar data from U.S. major league baseball which exhibited a decline in the average number of trades per team per year after the draft was implemented in 1965 (Daly and Moore, p. 86). While the number of trades in Japanese baseball has increased since 1965, it is noteworthy that star players who remain productive always remain with the same team during their career. Trades tend to involve minor league players and journeymen players. As in American baseball, cash transactions are prohibited unless the player is being offered for sale at a maximum price to other teams, a practice known in the U.S. as placing a player "on waivers."

The increase in the number of trades once the draft was implemented is not particularly

surprising. In a draft system, each team has incentives to pick the best player who is currently available. A team could, however, end up with too many pitchers and too few outfielders. The team would then trade a good pitcher for one or more outfielders. Such transactions are less likely to occur in the open bidding system unless the team makes mistakes in its judgment of a player's talent. If a team signs a top first-base prospect who quickly reveals his lack of talent, the team may wish to readjust its portfolio of players to ensure some strength at first base even if reserve or starting talent at other positions must be sacrificed.

Table 2 lists pennant winners in each league over our sample period, 1958-1992. An inspection of pennant winners in the Central League reveals a single dominant team: the Yomiuri Giants, a Tokyo-based team. Between 1958 and 1973, the Giants won 13 of 16 pennants including nine in a row between 1965 and 1973! Their dominance is comparable to the New York Yankees' dominance of the American League. Between 1947 and 1964, the Yankees won 16 of 18 pennants in the American League! While the Yankees would win four pennants after 1964 and the Giants would win seven pennants after 1973, both teams were much less successful in the post-draft period than in the pre-draft period. Of course, the Yomiuri Giants also won eight straight pennants immediately after the 1965 change. Their incredible success was, however, generally due to dominant players, such as Sadahara Oh, who were signed during the open bidding period. As these players retired, the Giants lost their overwhelming dominance of the Japanese game.

In the Pacific League no team fully dominated during the pre-draft period, although the Hawks won four of eight possible pennants. If we include an adjustment period of five years in which most star players were acquired during the open-bidding period, the Hawks won five of 13 pennants. While no team dominated during the 1970s, the Lions have won nine of 11 pennants since 1982 and the Lions and the Braves have won 16 of 22 pennants since 1971. While one team was somewhat dominant prior to the draft, two teams have dominated in the Pacific League since the draft was instituted.

Table 3 presents a more formal analysis of pennant dominance in each league. We calculate

Hirschmann–Herfindahl indexes (HHI) of pennant winners to obtain a formal measure of pennant dominance by one or a few teams in both the open–bidding and draft periods. The HHI is defined as

$$(1) \qquad HHI = \sum_{i=1}^{6} s_i^2$$

where s_i is the decimal share of team i in league pennants over the relevant period. If one team wins all pennants, i.e., is dominant, then HHI equals 1.0. If the six teams share equally in the period's pennants over the 8–year open–bidding period, then HHI equals .188. If the six teams share equally in the period's pennants over the 28–year draft period, then HHI equals .168.[11]

Table 3 compares the HHI in each league during the open–bidding and draft periods, utilizing 4–, 5–, and 6–year adjustment periods. The results are robust to the specification of the adjustment period. For the Pacific League, the HHI range from .2551 to .2778 in the open–bidding period and from .2771 to .2933 in the draft period. The small increase in dominance during the draft period demonstrates that the change to a draft does not necessarily lead to more equality in performance. For the Central League, the HHI range from .5972 to .6797 under open bidding and from .2850 to .3233 under the draft. The large increase in equality is striking and, as we explained above, is due to the decline in the Yomiuri Giants' dominance.

Hirschmann–Herfindahl measures of team pennant dominance take into account only championship performance. In a sports league, the mobility of other teams in the standings over time is also important. Predictability of team finish over time is likely to lead to less fan interest in pennant races and individual games. To compare mobility of teams within the standings over time, we compare Spearman rank correlation coefficients for team standings across pairs of four–year periods in each league. Table 4 presents the estimated correlations. For the Pacific League, the average estimated correlation is .734 in the open–bidding period (1958–1970) and .807 in the draft period (1971–1992). The decrease in team mobility over time during the draft period mirrors the increase in pennant dominance in the Pacific League during the draft period. For the Central League, the average estimated correlation is .8875 in the open–bidding period (1958–1970) and .7414 in the

draft period (1971-1992). The increase in team mobility over time during the draft period mirrors the decrease in pennant dominance in the Central League during the draft period. Although the average estimated correlation coefficient in the Pacific League is higher than in the Central League during the draft period, the range of estimated coefficients is wider in the Pacific League (.525 to .9778) than in the Central League (.6286 to .8429). If we estimate correlation coefficients pairing the entire open-bidding sample (1958-1970) with the entire draft sample (1971-1992), the results reverse: the Pacific League correlation across the two periods is .7867 and the Central League correlation across the two periods is .6342. These results provide some evidence that the draft has led to more short-term variation in standings in the Pacific League and more long-term variation in standings in the Central League.

The Japanese rank correlations contrast with Daly and Moore's (p. 90) results for the open-bidding and draft period comparisons in the United States. Estimated Spearman rank correlation coefficients pairing the entire open-bidding sample (1955-1964) with the entire draft sample (1969-1973 or 1965-1973) are negative (-.488 for 1969-1973 and -.613 for 1965-1973) for the American League and positive but relatively small (.185 for 1969-1973 and .232 for 1965-1973) for the National League. While the results seem to show that the switch to the draft had a greater impact in U.S. baseball, the limited size of the draft sample precludes any strong conclusions about the U.S. results or definitive comparisons with the Japanese results. The comparison is, however, consistent with our analysis predicting more short-run equality in the U.S. than in Japan, given the difference between the draft systems in the two countries' professional baseball leagues.

VI. Conclusion

Our paper's analysis is important for three reasons. First, by introducing two factors commonly observed in professional sports, imperfect information on new recruits and outlier, highly skilled players, it calls into question the magnitude of the changes that would be expected upon changing the rule structure for recruiting new players. Second, since baseball institutions in Japan have been more stable than baseball institutions in the U. S., the empirical analysis of the 1965 switch

in recruitment rules in Japanese professional baseball provides a cleaner test of the effects of the rule change than U.S. data. Finally, the similarity with the results from (the poor) U.S. data is striking. One baseball league in each country (the Central in Japan, the American in U.S) possessed a dominant team (the Giants in Japan, the Yankees in the U.S.) under the open-bidding system, while the other league (the Pacific in Japan, the National in the U.S.) had substantially more equality. After the 1965 rule change in both countries, the leagues previously with a dominant team become substantially more competitive. In the other more competitive league, there is less change--in the U.S. there is slightly more competition in the National League and in Japan the measures of competitive change for the Pacific League are mixed. The similarity of the effects generated across cultures and countries from the rule changes is striking and shows, once again the importance of the structure of property rights in any competitive framework.

REFERENCES

Coase, Ronald H. "The Problem of Social Cost." Journal of Law & Economics 3 (1960): 1–44.

Daly, George G. "The Baseball Player's Labor Market Revisited." In Paul M. Sommers, ed. Diamonds Are Forever: The Business of Baseball. Washington, D.C.: The Brookings Institution, 1992.

Daly, George G., and William J. Moore. "Externalities, Property Rights and the Allocation of Resources in Major League Baseball." Economic Inquiry 19 (January 1981): 77–95.

Obojski, Robert. The Rise of Japanese Baseball Power. Radner, PA: Chilton Book Co., 1975.

"Puro–Yakyu Dorafuto 25–Nenshi (Twenty–five Years of Professional Baseball Draft History)," Baseball Magazine (1989).

Rottenberg, Simon. "The Baseball Players' Labor Market." Journal of Political Economy 64 (June 1956): 242–58.

Sato, Takao. Puro–Yakyu Kyoyaku–ron (Contract in the Professional Baseball). Tokyo: Ichiryusha, 1982.

Table 1

Japanese Baseball League Player Trading Activity,
1958–1991

Year	Number of Trades (per 100 player)	Year	Number of Trade (per 100 players)
1958/59	3.70	1965/66	3.61
1959/60	3.15	1966/67	3.19
1960/61	2.78	1967/68	4.44
1961/62	3.89	1968/69	2.78
1962/63	2.08	1969/70	3.47
1963/64	2.50	1970/71	3.33
1964/65	3.19	1971/72	4.03
		1972/73	5.00
N=7; mean=3.04		1973/74	2.92
S.D.=0.59		1974/75	6.94
		1975/76	7.08
		1976/77	6.11
		1977/78	2.92
		1978/79	5.69
		1979/80	3.33
		1980/81	3.89
		1981/82	2.92
		1982/83	4.03
		1983/84	4.44
		1984/85	3.89
		1985/86	3.33
		1986/87	5.14
		1987/88	3.75
		1988/89	5.00
		1989/90	7.08
		1990/91	6.11
		1991/92	3.10

N=27; mean=4.35
S.D.=1.33

Source: Baseball Magazine Sha, *Puroyakyu Toredoshi II (Professional Baseball History of Players Trade II)*, Tokyo, 1991.

Note: The number of trades is normalized by the number of players allowed to be registered in the next season. Each team (12 in total) was allowed to have 45 players in 1959-60; 60 players in 1961-91; and 70 players in 1992.

Table 2

Pennant Winners, 1958–1992

Year	Central League	Pacific League
1958	Giants	Lions
1959	Giants	Hawks
1960	Whales	Orions
1961	Giants	Hawks
1962	Tigers	Flyers
1963	Giants	Lions
1964	Tigers	Hawks
1965	Giants	Hawks
1966	Giants	Hawks
1967	Giants	Braves
1968	Giants	Braves
1969	Giants	Braves
1970	Giants	Orions
1971	Giants	Braves
1972	Giants	Braves
1973	Giants	Hawks
1974	Dragons	Orions
1975	Carp	Braves
1976	Giants	Braves
1977	Giants	Braves
1978	Swallows	Braves
1979	Carp	Buffaloes
1980	Carp	Buffaloes
1981	Giants	Fighters (former Flyers)
1982	Dragons	Lions
1983	Giants	Lions
1984	Carp	Braves
1985	Tigers	Lions
1986	Carp	Lions
1987	Giants	Lions
1988	Dragons	Lions
1989	Giants	Buffaloes
1990	Giants	Lions
1991	Carp	Lions
1992	Swallows	Lions

Source: Central League

Table 3

Herfindahl–Hirschmann Index (HHI)

Year	Central	Pacific
(Total) 1958–92	0.3747	0.29229
(Pre–Draft)		
1958–65	0.4688	0.3438
1958–69	0.5972	0.2778
1958–70	0.6213	0.2544
1958–71	0.6429	0.2551
1958–72	0.6622	0.2622
1958–73	0.6797	0.2734
(Post–Draft)		
1969–92		
1970–92	0.3233	0.2741
1971–92	0.3099	0.2933
1972–92	0.2971	0.2880
1973–92	0.2850	0.2850

Note: The HHI for Central increases as additional years are added because the Giants won the pennant every year between 1966 and 1973, thereby adding to single team dominance in the Central League during the pre–draft period. An HHI equal to one, its upper bound, reflects complete dominance by one team. An HHI equal to 0.1667, its lower limit, reflects complete equality in pennant winning performance among the six teams.

Table 4

Estimated Spearman Rank Correlation Coefficients

Year	Central	Pacific
1958–61 and 1962–65	0.8607	0.8393
1962–65 and 1966–69	0.9143	0.6286
1966–69 and 1970–73	0.9929	0.7929
1970–73 and 1974–77	0.7393	0.9643
1974–77 and 1978–81	0.6286	0.5250
1978–81 and 1982–85	0.6625	0.6679
1982–85 and 1986–89	0.8339	0.9000
1986–89 and 1990–92	0.8429	0.9778
1958–69 and 1970–92	0.8098	0.6340
1958–70 and 1971–92	0.7867	0.6342
1958–71 and 1972–92	0.7899	0.6777

Note: A high correlation between 1966–69 and 1970–73 for the Central League (0.9929) and between 1986–89 and 1990–92 for the Pacific League (0.9778) largely reflects single team dominance across periods. The Giants won every year from 1966 to 1973. The Lions won the Pacific League every year from 1986 to 1992 except 1989.

FOOTNOTES

1. The quote defining the reserve clause is from Daly and Moore, p. 77.

2. The player would consider not just the team's salary offer but also additional income-earning opportunities from joining the team, such as product endorsements.

3. Perhaps the most famous pre-WWII sale of a star player was the Boston Red Sox 1920 sale of Babe Ruth to the New York Yankees for $100,000 and a $350,000 guarantee of the mortgage on the Red Sox home, Fenway Park.

4. Charles Finley, the owner of the Athletics, had proposed selling outfielder Joe Rudi and relief pitcher Rollie Fingers to the Boston Red Sox and starting pitcher Vida Blue to the New York Yankees.

5. Receiving many mediocre players is not equivalent to receiving cash. Team rosters are limited and the number of players who can be on the field at any given time (nine) is also limited. While the skills of two mediocre players cannot be combined on the playing field, cash is both additive and fungible. Intertemporal trades are, however, not uncommon in some sports where a star player or prospect will be traded for many future high draft picks.

6. Daly and Moore clearly recognize these difficulties in their discussion of their empirical tests. Given their limited data set, they do not alter their tests to take them into account.

7. The Central League has been playing with six teams since 1953. In the Pacific League, after three seasons (1954 to 1956) in which eight teams competed, seven teams played in 1957, and eight teams in 1958. Since then, six teams have played in each of two Japanese professional baseball leagues.

8. This ignores the contribution of coaches, managers, scouts, and off-field management. Since there is a free market for their services, they are likely to work for the teams with which they have the highest marginal revenue product. Following our reasoning with respect to players, the most productive personnel are likely to work for big city teams. If productivity differences are substantial and management contributes significantly to team productivity, the big city teams will dominate team performance even under a new player draft.

9. In Japan, the random draft provides the expectation that the player will be assigned to an average team, enabling that team to dominate immediately or within a short period of time. In the United States the expectation is that the player will be assigned to the worst team; it may take several years for the U.S. team to accumulate an average quality team to complement the dominant player. Thus a particularly skilled player is likely to have a larger impact on team dominance in Japan than in the United States.

10. Our analysis ignores the effect of player injuries. Suppose a very good U.S. team finishes last in its league because of unlucky injuries to several key players. The team will then be able to draft first and thereby to add relatively good players to its already solid base. In this case, a single season of bad luck may enable the team to have several seasons of solid performances. Of course, the talent available in each year's draft also varies substantially from year-to-year. Our analysis above assumes that the team drafting first will be able to add one or more players with excellent skills.

11. Assuming that each of the six teams wins one sixth of the pennants, the minimum HHI is .167. If, however, the total number of pennants is not divisible by six, then the minimum HHI will be higher. For example, if the sample has only three pennants, then the minimum HHI is .333. As the sample becomes large, the minimum HHI approaches .167.