

FREE AGENTS AS PERSPICACIOUS  
PEREGRINATORS: A COMMENT

by

Sumner J. La Croix and Torben Andersen\*

Working Paper No. 89-15  
May 30, 1989

\* Department of Economics, University of Hawaii, Honolulu, Hawaii,  
and Department of Humanities and Social Sciences, Red Deer College,  
Red Deer, Alberta, respectively.

Free Agents as Perspicacious Peregrinators:  
A Comment

By

Sumner J. La Croix and Torben Andersen\*

Working Paper No. 15  
May 30, 1989

\*Department of Economics, University of Hawaii, Honolulu, Hawaii, and Department of Humanities and Social Sciences, Red Deer College, Red Deer, Alberta, respectively.

Recently in this *Review*, Cymrot and Dunlevy (1987) modeled the migration decisions of major league baseball players using the perspicacious peregrinator model of Polachek and Horvath (1977). Their model hypothesizes that individuals decide whether or not to migrate (or, more specifically, to switch teams) based on the size of potential gains measured as the difference between earnings with and without migration. The main purpose of this comment is to point out some avoidable conceptual flaws in Cymrot-Dunlevy's application of the model to major league baseball players' migration decisions. We also suggest some interpretations of their empirical results which differ from Cymrot-Dunlevy's conclusions.

The first important problem is with the specification of the basic earnings equation. Cymrot-Dunlevy follow Scully (1974) where player marginal revenue product is modelled in a two-step process: team output (winning percentage) is related to a number of team inputs (offensive and defensive performance measures), and then team revenue is related to team output and market characteristics of the team's city. In applying this framework to the player migration question, it appears that Cymrot and Dunlevy have confused factors which increase demand for the individual player and factors which increase demand for all players.

Consider the fundamentals of player salary determination. In a competitive player market<sup>1</sup> a player's salary with his current team must cover his opportunity cost: namely his value to the team that would otherwise employ him (the team placing second highest value on his services). Should the player's personal productivity increase, he becomes more valuable to all prospective employing teams. In the context of the Cymrot-Dunlevy specification, an increase in the player's slugging average, a common measure of offensive player productivity,<sup>2</sup> will increase the demand for the individual player and increase his salary. That

is to say, an "eligible" player is able to capture the rents associated with his superiority over other players. Contrast this with a change in market characteristics such as a rise in the population of a player's city. This will increase the team's marginal revenue from winning extra games, and this higher profitability will increase the demand for players. But this is an increase in the demand for players in general. The extra rents are not associated with specific players, but with the right to operate a baseball team in the city where population has grown. Indeed, to the extent that demand for players rises, player salaries may rise depending on the elasticity of supply of players. At any rate, we expect but a very weak positive relationship between the salary of an individual player and the market characteristics of his home team. In fact, with strong interteam competition for players, their salaries should be no more strongly related to market characteristics of their home cities than to those of other major league cities. In conclusion, in this cross-sectional player salary study there is no theoretical argument for including city-specific demand variables in regression specifications. This argument applies to the POP (population) and GPOP (population growth rate) variables used by Cymrot and Dunlevy.

Team characteristics, as opposed to home city market characteristics, are also included in Cymrot and Dunlevy's earning equations. Due to potential complementarity between a player's productivity and his teammates' productivity, team characteristics may capture important effects. For instance, crucial to the migration decision is "a player's hypothetical salary (HSAL) which he would earn had his migration decision been different" (p. 55). HSAL is calculated by substituting the individual and team characteristics of players who choose to move to another team into the earnings equation for non-mover players who are

eligible to move. One problem (which is acknowledged by Cymrot and Dunlevy, p. 55) with implementing this procedure stems from identifying the team to which the player would move; HSAL will vary depending on the team to which the player would have chosen to move. For players who migrate (movers), Cymrot and Dunlevy use the characteristics of the team which the player left; for non-movers, they use the average team characteristics of the moving players. We believe that these specifications are incorrect. For any player, whether a mover or non-mover, HSAL should be determined with respect to the team that would place the next highest value on the player's services. The team which maximizes HSAL should be the team for which characteristics are entered into the earnings regression. In general, for a mover this may not be the team he just moved from, and for a non-mover will certainly not correspond to the hypothetical average team whose characteristics are used. In a footnote Cymrot and Dunlevy acknowledge that: "Other rules, including the use of team characteristics that maximize and minimize the size of HSAL were considered; the results of the migration equation do not appear to be sensitive to the particular rule chosen." (p. 56) Even so, maximization of HSAL is clearly the superior specification a priori; it is surprising that this was not the one reported.

However, there is a significant flaw in the earnings equation, correction of which might well lead to different results for HSAL, and could make HSAL sensitive to the specification choice discussed in the last paragraph. Cymrot and Dunlevy include a variable, DSA79, which is the difference between the team's 1979 slugging average and the player's slugging average. It is intended to measure the player's marginal contribution to team performance. The inclusion of a variable to measure the player's marginal contribution to team performance is clearly warranted by neoclassical productivity theory, but DSA79 is a flawed

measure. A given free agent does not replace the statistically average player on the team: he replaces a specific player whose own performance characteristics will generally differ significantly from characteristics of his team as a whole. Average team productivity characteristics do not reflect the impact on team performance made by adding a free agent to a team.<sup>3</sup> The true expected marginal impact can be found by adding the productivity of the free agent and subtracting the productivity of the player who would otherwise receive the same playing time for the team.<sup>4</sup> To identify the player who would be dropped from the team, the fact that most players are largely specialized to playing one or two positions must surely be considered. We believe that the misspecification of this variable may have seriously weakened the empirical results.<sup>5</sup>

We presume that 1980 salaries depend on productivity expected in the 1980 season. In the Cymrot-Dunlevy analysis (p. 53-5), 1980 salary is explained by a vector of variables including actual 1979 productivity adjusted for stadium effects (ADJSA79) and lifetime productivity (LSA). This specification may well contribute to the difference in findings for eligible and ineligible players, as it seems likely that LSA would be a better predictor of ADJSA80 in the case of players with more years of experience and ADJSA79 would be a better predictor for players with less experience.<sup>6</sup> If so, this may be important given that eligible players have about twice as much experience as ineligible players (Table 1, p. 53). The results in Table 2 (p. 55) support this supposition in the case of LSA. Among eligible players the positive effect of LSA on earnings is stronger and more significant than among ineligible players. And, as expected, the relationship between 1980 earnings and ADJSA79, is positive for ineligible players. If the enhanced performance is a signal that future performances will be better than average, then one would expect a positive sign for the estimated

coefficient. Earnings for eligible players who have relatively little experience are more likely to have a positive relationship with ADJSA79, as their productivity may be expected to increase over time; and eligible players who have a great deal of experience are more likely to have a negative relationship with ADJSA79, as the productivity of players near the end of their careers usually declines. These effects could be captured by using an interactive variable that reflects years of major league experience (MLE in their paper) and adjusted slugging average for the 1979 season (ADJSA79).

Cymrot and Dunlevy's salary data exclude bonus (i.e., performance-based) payments; they observe that no general assessment can be made of any bias that might be introduced by the omission. They note that if bonuses are proportional to observed salaries, the findings of the paper are left intact. However, we believe that there may be systematic variation in the ratio of bonus to base pay across eligible and ineligible players. Younger players with less experience are more likely to be paid on the basis of performance (i.e., this season's output) for two reasons. Management has less information concerning the effort a younger player will display on the field and there is likely to be a greater degree of natural performance variation which is unpredictable by the owner and uncontrollable by the player himself in the case of a less experienced player. While a risk averse player surely would prefer a higher base salary, an owner has incentives both to give young players incentives to play well and to gather information on the player's elasticity of effort with respect to bonuses.<sup>7</sup> As an owner gathers more information on a player's productivity and "attitude", they can satisfy the risk averse player's desire for a higher base salary at a lower cost.<sup>8</sup> Increases in the base pay (and reductions in performance pay) will, however, only be made for players who have a low elasticity of effort with

respect to bonus pay. Our analysis is consistent with the finding that base salary is positively related to major league experience in all four groups and the relationship is significant for three of the four groups.<sup>9</sup>

Cymrot and Dunlevy's equation explaining the probability of a player moving shows that players who have moved less frequently in the past and who have been with their present team longer are less likely to move. It is stated that the results "indicate that personal (and unobservable) characteristics of some players make them more likely to migrate" (p. 57). They suggest that this may be due to variability in players' ability to acquire team-specific human capital, with players acquiring more becoming less likely to move. This seems possible, though no examples of types of team-specific human capital are offered by Cymrot and Dunlevy and no examples are known to us. Perhaps some factors which influence player productivity are team-specific only due to the difficulty of observing and measuring them and not because they are valuable to only one team. Below we argue that these "unobservable" characteristics do not "make players more likely to migrate" but could reduce or increase migration.

The characteristics which are unobservable must be observable to the employing team if they are indeed relevant characteristics. They are unobservable in the sense that other teams (i.e., potential employers) cannot observe them prior to acquiring the player. Characteristics which measure the player's future productivity are likely to fit into this classification. If the dimensions of a player's productivity which are unobserved are positive ones, such as good work habits and careful attention to maintaining long term health, player movement will tend to be reduced. Players with very desirable unobservable characteristics will rarely change teams since other teams will not bid for players who have unobservable productive characteristics. For a player



who is becoming a free agent, his current team has no incentive to reveal truthful information about his positive unobserved characteristics. On the other hand, in the case where the team retains property rights in a player and attempts to trade him, the team will be unable to convince other teams of the true value of the player. But to the extent that the unobserved personal characteristics are negative ones, the player will tend to move more often, since once a team learns of these characteristics they will only continue to employ him if his salary can be reduced. This gives the player, if he is eligible to move to another team, the incentive to move frequently to new, unsuspecting teams. If property rights in the player are owned by the team, they will also be more likely to try to move a player with unobservable detrimental characteristics, notwithstanding the team's concern over what its long term reputation is in the market for player trades.

One example of such an unobservable characteristic is the state of player's health. When a player is injured and his ability to perform at his previous level is permanently impaired, team management may have information about the injury that is unavailable to other teams. Since the current team is likely to reduce his salary, the player will try to obtain a higher base salary from another team. Neither the team nor the player is likely to give this information to teams who are potential employers. On the other hand, a player who has been injured but has fully recovered, may have a difficult time marketing himself to other teams. Team management may be aware that the injury is unlikely to reduce the player's productivity, but when the player is a free agent the team will not offer this information to other teams, whereas when the team owns the player's rights, other teams will distrust this information. In this case, the player is more likely to stay with his original team. In general, unobservable

characteristics could reduce or increase player migration.

## REFERENCES

- Andersen, Torben. "Race Discrimination by Major League Baseball Fans."  
Unpublished doctoral dissertation, University of Washington, 1988.
- Cymrot, Donald J. and James A. Dunlevy, "Are Free Agents Perspicacious Peregrinators?" *Review of Economics and Statistics* 69 (February, 1987), 50-58.
- Lehn, Kenneth, "Property Rights, Risk Sharing, and Player Disability in Major League Baseball," *Journal of Law & Economics* 25 (October, 1982), 343-66.
- Polachek, Solomon W., and Francis W. Horvath, "A Life Cycle Approach to Migration: Analysis of the Perspicacious Peregrinator," in R. G. Ehrenberg (ed.), *Research in Labor Economics*, Vol. 1 (Greenwich, Ct: JAI Press, Inc., 1977), 103-50.
- Scully, Gerald W., "Pay and Performance in Major League Baseball," *American Economic Review* 64 (December, 1974), 915-930.

## FOOTNOTES

1. Cymrot and Dunlevy divide the player market into four classifications: eligible movers, ineligible movers, eligible non-movers, and ineligible non-movers. "Eligible in these classifications means the player has six or more years of major league experience and is eligible to become a free agent. Mover means the player actually changed teams between 1978 and 1980" (Cymrot and Dunleavy, pp. 52-3). The "competitive player market" in the text corresponds to the "eligible" categories in Cymrot and Dunlevy.

2. Slugging average is represented by two variables, ADJSA79 and LSA, in Cymrot and Dunlevy's empirical work. LSA represents lifetime slugging average, while ADJSA79 represents the player's slugging average in 1979 (adjusted for stadium effects).

3. Free agents often replace players from the lower end of the team's offensive productivity distribution. A free agent could, however, replace a player from the upper end of the team's offensive productivity distribution if he replaces a player whose offensive production is below league standards at his position.

4. It could be even more complicated than this. Suppose a team presently plays B at second base, with C as a reserve. Now A, who is more productive than B or C is hired. A will be the starting second baseman, B becomes the reserve, and C is released. The marginal product to the team of adding A is his output, less C's output, less the drop in B's output caused by B receiving less playing time now that he is a reserve. But even without considering such second or third order effects, the adjustment we suggest in the text would be preferable to using team productivity statistics.

5. In fact Cymrot and Dunlevy include one variable implicitly recognizing that hitting performance differs between positions. The DFN dummy separates second basemen and shortstops from other hitters. Yet the highest degree of defensive specialization occurs at catcher, and many catchers retain starting jobs despite having far below average offensive performance. So it is surprising that a similar dummy variable for catchers was not included in the salary equations.

6. This proposition assumes that deviations in slugging average from the expected path are greater during the player's early years in the major leagues.

7. This conclusion may have to be qualified given the fact that among ineligible players there may be a considerable number of players earning the major league minimum salary. In the absence of this restriction, many of these players would be earning a lower salary. Given the price control on these players, the probability of bonus provisions in their contracts seems remote. The minimum salary restriction may also be another factor in deterring movement by ineligibles. Since as a group ineligible players are less productive, have less experience, and receive less playing time than eligible players, ineligibles are more likely to have to be paid a salary above what they would earn in the absence of the minimum requirement. Given this, the GAIN from movement is probably reduced more for ineligible than eligible players.

8. Lehn (1982) argues that "players' willingness to sign guaranteed multiyear contracts is consistent with the postulate of nondecreasing relative risk aversion" (p. 353).

9. Andersen (1988, ch. 6) has found that holding performance constant, more experienced players are more popular with fans. This provides an additional explanation for the positive relation between experience and base salary.