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Performance When It Counts? The Myth of the Prime Time Performer in Professional Basketball

The neoclassical vision of the world rests upon the notion that economic actors “know that which they do.” In contrast, as James Peach and Richard Adkisson (1997) have noted, the work of such institutionalists as Thorstein Veblen, Clarence Ayres, John R. Commons, and John Kenneth Galbraith are driven by a desire to expose the mythology people employ to explain the world observed. Within this tradition, we consider the words Veblen offered on professional sports.¹

This peculiar boyishness of temperament in sporting men immediately becomes apparent when attention is directed to the large element of make-believe that is present in all sporting activity. Sports share this character of make-believe with the games and exploits to which children, especially boys, are habitually inclined. Make-believe does not enter in the same proportion into all sports, but it is present in a very appreciable degree in all. . . . Except where it is adopted as a necessary means of secret communication, the use of a special slang in any employment is probably to be accepted as evidence that the occupation in question is substantially make-believe. ([1899] 1953, 170–171)

Contrary to the neoclassical vision, in which economic actors base their actions upon reality, Veblen saw the world of sports as make-believe. To illustrate the make-believe nature of professional sports, we turn to the National Basketball Association (NBA). Fans have asserted that some NBA players can choose to elevate their performance in the postseason.² Consider a typical quote from a sports writer:

Even if one despised the Los Angeles Lakers with an indefatigable passion, their history of making devastating, huge shots with games, series and seasons on the line cannot be ignored. Robert Horry, Derek Fisher and, of course, Kobe Bryant have all displayed the ability to consistently toss pressure aside and stroke game-changing shots. (Martin McNeal, “Bryant Takes Turn at Hitting Big Shot,” *Sacramento Bee*, June 9, 2004)

The NBA’s official Web site even ranks what it calls “prime time” players by posting player career differentials between points scored in the playoffs and points scored during the regular season.

The largest “prime time” mythology has most likely developed regarding Michael Jordan, who has often been labeled the greatest basketball player in the history of the game. Consider the dramatic story told about game 6 of the 1998 NBA finals between the Chicago Bulls and Utah Jazz. The Bulls led the series three games to two but needed to win one of two games in Utah to win the NBA championship. With twenty seconds remaining, it appeared that a seventh game would be necessary to decide the outcome of the series. The Utah Jazz had both the ball and a one-point lead. The Jazz still needed to

score, so the ball went to one of the most prolific scorers in NBA history, Karl Malone. Jordan, though, proceeded to steal the ball from Malone. On the subsequent possession, Jordan had the ball and the following unfolded:

The defender (Byron Russell of the Utah Jazz) loses his footing and falls to the court as he tries to keep the best player in the game from blowing past him. *Michael Jordan seizes the moment.* He stops on a dime, elevates and lets fly with the shot that will win or lose the game. Nothing but net. (*Sporting News NBA Guide 1998-99*, 117; italics added)

The above story suggests that Jordan was able to elevate his game at the moment the Bulls needed to score in order to win the game. The box score from the same contest, however, reveals a different story. Prior to the game-winning shot, Jordan had taken thirty-four shots and made only fourteen, a success rate of 41 percent. Had Jordan just converted at a rate of 47 percent, his regular season performance, he would have already made two additional shots before the final seconds of the game and the game winning shot would not have been necessary. One wonders, if Jordan could choose to elevate his game and make a shot when it was needed, why he did not choose to elevate his game earlier in the contest and avoid missing twenty shots? Furthermore, if Jordan had this ability, why did he convert only 34.6 percent of his shots in game 5, a game the Bulls lost by two that would have also clinched the title?

Confirmation Bias in Basketball

Perhaps the way in which empirical evidence is processed by economic actors will influence their perception of reality. Herbert Simon introduced the concept of “bounded rationality” into the economists’ dictionary in an effort to

focus attention upon the discrepancy between the perfect human rationality that is assumed in classical and neoclassical economic theory and the reality of human behavior as it is observed in economic life. The point was not that people are consciously and deliberately irrational . . . but that neither their knowledge nor their powers of calculation allow them to achieve the high level of optimal adaptation of means to ends that is posited in economics. (1992, 3)

As noted by Amitai Etzioni (1988), the limits of the human mind have also been noted in the work of cognitive psychologists who introduced prospect theory.³ In essence, prospect theory states that people utilize various heuristic devices to simplify incoming information in an effort to overcome the limited ability of the human mind to process complex information. Such simplification tools bias a person’s computations in a fashion that renders subsequent decisions inconsistent with the precepts of instrumental rationality.

One such device is the concept of confirmation bias, introduced in the work of Daniel Kahneman and Amos Tversky (1973). Under confirmation bias, people tend to more often notice evidence that supports their claims while ignoring evidence that refutes their a priori positions. In the present context, fans of an NBA player who they believe is a prime time player will be more likely to recall playoff games in which the player performs well and will be more likely to forget games in which the player performs poorly.

Is the “prime time” player a reflection of reality, or simply evidence of a cognitive bias in the perception of the NBA? Beyond the important topic of human rationality lies a more practical story for researchers examining the economics of sports. As noted in Berri, Schmidt, and Brook 2004, one additional playoff win generated an average of more than one million dollars in gate revenue from the 1992–93 season to the 1995–96 campaign. These authors estimated that one would need fourteen regular season victories to generate an equivalent level of revenue. Despite the revenue potential of the playoffs, past studies into the marginal revenue product of a professional athlete have typically focused solely on the regular season. Furthermore, we are aware of no study which compares the regular season to the playoffs.⁴ If the prime time player does exist, though, the calculation of marginal revenue product via these traditional approaches severely underestimates the economic value of these athletes.

Measuring Player Productivity

Before we can answer whether or not some players can consistently perform better in the playoffs, we need a measure of productivity. Past studies employing data from professional basketball have usually employed a kitchen sink approach, which calculates productivity from a reduced form equation that includes every available productivity measure. Researchers such as James Quirk and Rodney Fort (1992), Gerald Scully (1995), Jeffery Jenkins (1996), and Andrew Hanssen and Torben Anderson (1999) have all argued against the kitchen sink approach and in favor of the accuracy offered by an index of player performance. The index we will employ was developed in Berri 2004.⁵ Following the methodology laid forth in Scully 1974, wins are regressed upon two variables—points per possession employed and points surrendered per possession acquired. Possessions employed incorporate field goal attempts, offensive rebounds, turnovers, and a fraction of free throws attempted. Possessions acquired include opponent’s turnovers, defensive rebounds, team rebounds, opponent’s made field goals, and a fraction of opponent’s made free throws.⁶ Because both a team and its opponent average approximately one point per possession employed or acquired, the impacts upon wins of each of the elements employed in the model are essentially equal. Hence we are left with the following relatively simple model of player productivity:

$$\text{Productivity (PROD)} = \text{PTS} + \text{ORB} + \text{DRB} + \text{STL} - \text{FGA} - 0.44 \cdot \text{FTA} - \text{TO}. \quad (1)$$

where *PTS* = points scored, *ORB* = offensive rebounds, *DRB* = defensive rebounds, *STL* = steals, *FGA* = field goals attempted, *FTA* = free throws attempted, and *TO* = turnovers.

This model is very accurate, explaining 95 percent of team wins. Since players are given vastly different amounts of playing time, we will focus on a player's productivity on a per minute basis (PMIN), given by

$$\text{PMIN} = \text{PROD} / \text{Minutes Played.} \quad (2)$$

Evidence for the Prime Time Performer

Our data are the complete player records from nine seasons, beginning in 1994–95 and concluding with the 2002–03 campaign.⁷ Since we were looking for prime time, or “high impact,” players, we looked at all players who played a significant number of minutes over an extended stay in the playoffs. Specifically, we defined an extended stay in the playoffs as one in which a player played in at least ten games in a given postseason. Furthermore, such players had to play at least twenty minutes per playoff contest and at least twenty minutes per regular season contest. Our population was 160 players and 333 observations over nine seasons.

Table 1 compares the average level of productivity offered by players in our population in both the regular and postseason. Player productivity was generally lower in the playoffs. For example, the average level of PMIN in the regular season was 0.189 while only 0.174 in the playoffs. We also considered each of the elements of PMIN, as well as assists and blocked shots. Like our analysis of productivity, we considered the player's per minute production of each variable. With the exception of free throws attempted

Table 1. Descriptive Statistics for Per Minute Productivity Measures (Sample: 333 Players from 1995 to 2003)

Variable	Regular Season		Playoffs		Correlation between Season and Playoffs
	Mean	Standard Deviation	Mean	Standard Deviation	
PMIN	0.189	0.088	0.174	0.089	0.865
Points	0.430	0.136	0.402	0.133	0.906
Rebounds	0.177	0.084	0.171	0.081	0.939
Steals	0.035	0.013	0.031	0.013	0.667
Field goal attempts	0.342	0.099	0.323	0.099	0.916
Free throw attempts	0.115	0.057	0.116	0.060	0.887
Turnovers	0.060	0.017	0.055	0.019	0.760
Blocked shots	0.021	0.023	0.020	0.022	0.921
Assists	0.103	0.060	0.090	0.055	0.937

and blocked shots, there is a decline in productivity between the regular season and the playoffs. For two thirds of the productivity measures, the regular season variance is greater than or equal to the playoff variance.

The correlation between the player's production of each measure in the playoffs and the regular season is quite high. For example, the correlation coefficient between a player's per minute point production in the regular and postseason is 0.906. Rebounds, field goal attempts, blocked shots, and assists also register a correlation of 0.90 or higher. In fact, only steals and turnovers have a correlation coefficient below 0.85.

Our primary concern is our measure of each player's marginal productivity, PMIN. As noted in table 1, the correlation between season and playoff productivity is 0.865. In other words, if one were to regress a player's postseason PMIN on the level of productivity the player achieved in the regular season, one would see that 75 percent of a player's playoff production can be explained by his regular season performance.⁸

Beyond the simple univariate approach, we also considered a model designed to connect postseason productivity to a number of theoretically relevant independent variables. In addition to a player's regular season contribution, we argue that postseason productivity should be influenced by four additional factors. The first is player injury, which should manifest itself in the number of games played in the regular season (REGGM). Second, observers of sports have argued that players will offer diminishing levels of productivity in the playoffs if the player is called upon to play excessive minutes in the regular season. Consequently, we considered the number of minutes played in the regular season (REGMIN). A related issue is the difference in minutes played per game in the postseason and the regular season (DIFMGM).⁹ Finally, we considered the quality of the competition the player faces. This is captured by noting the seeding (SEED) a player's team is given in the playoffs.¹⁰ Postseason per minute productivity is thus related to the factors listed in equation (3).

$$\text{POST- PMIN} = \beta_0 + \beta_1 \text{REGPMIN} + \beta_2 \text{REGGM} + \beta_3 \text{REGMIN} + \beta_4 \text{DIFMGM} + \beta_5 \text{SEED} + \epsilon. \quad (3)$$

The estimation of equation (3) is reported in table 2. The results indicate that little beyond regular season productivity explains postseason productivity. The explanatory power of the model is 0.76, or a power quite similar to the univariate approach outlined above. Still, one does see that postseason productivity is significantly impacted by both minutes played in the regular season and changes in the player's minutes per game. Specifically, the more minutes a player plays in the regular season, the worse he will play in the playoffs. Evaluated at the point of means, a 10 percent increase in minutes played in the regular season would result in a 1.7 percent decline in a player's per minute postseason productivity. Similarly, a small change in postseason performance is seen from changes in minutes per game. On average, the players in our sample played 2.06 additional minutes per contest in the postseason. Such an increase results in 2.7 percent

Table 2. Estimated Coefficients for Equation (3)

Variable	Coefficients
Constant	0.009 (0.530)
REGPMIN	0.891*** (31.039)
REGGM	2.36E-04 (0.832)
REGMIN	-1.31E-05*** (2.295)
DIFMGM	2.31E-03*** (3.333)
SEED	1.61E-03 1.106
Adjusted R-squared	0.757
F-statistic	208.071***

Notes: Dependent variable: Post-Season Per-minute Productivity (POST – PMIN).

Ordinary least squares estimation.

White heteroskedasticity-consistent standard errors and covariance

Sample: 333 players from 1995 to 2003 (t-stats in parentheses).

*** Significant at 5 percent level.

** Significant at 10 percent level (5 percent one-tailed).

improvement in postseason productivity. In sum, while both REGMIN and DIFMGM are statistically connected to postseason productivity, the economic significance is very small. Postseason productivity is still largely determined by regular season performance.¹¹

Although such results indicate that prime time performers are not common in the NBA, how many players are able to consistently offer higher level of productivity in the postseason? Table 3 looks at the forty-one players who had at least three extended stays in the postseason. Only Rick Fox and Tim Duncan were able to consistently offer higher levels of productivity in the post-season. One should note, though, that in 1999 the difference in postseason and regular season productivity for Duncan was only 0.0001. Overall, thirteen players were able to offer higher levels of productivity in the postseason more often than not. Of these players, only Ron Harper, Fox, and Luc Longley won an NBA championship. Harper and Longley, though, failed to log thirty minutes per postseason game when each played for the world champion Chicago Bulls of 1996, 1997, and 1998. Fox did play more than thirty minutes per playoff game for the Los Angeles Lakers, who won the title in 2001 and 2002. Fox, though, averaged only ten points per contest for this team. In other words, on a team with star players like Bryant and Shaquille O'Neal, he was hardly the primary weapon driving the team toward the title.

Table 3. Extended Playoff Appearance and Productivity, by Player

Name	Years of Extended Post-Season Play	Years of Above Average Post-Season Play	Average (Column 3 / Column 2)	Playoff Minus Season Productivity Average
Rick Fox	3	3	1.000	0.014
Tim Duncan	3	3	1.000	0.024
Reggie Miller	4	3	0.750	-0.010
Mark Jackson	4	3	0.750	0.025
Ron Harper	4	3	0.750	0.014
Charlie Ward	3	2	0.667	0.029
Nick Van Exel	3	2	0.667	-0.040
Aaron McKie	3	2	0.667	0.011
Jamal Mashburn	3	2	0.667	-0.025
Dan Majerle	3	2	0.667	0.021
Luc Longley	3	2	0.667	-0.002
Vlade Divac	3	2	0.667	-0.020
Chris Childs	5	3	0.600	0.010
Robert Horry	6	3	0.500	0.000
Steve Smith	4	2	0.500	-0.003
Derek Fisher	4	2	0.500	0.018
Dale Davis	4	2	0.500	0.001
Shaquille O'Neal	7	3	0.429	-0.015
David Robinson	5	2	0.400	-0.025
Scottie Pippen	5	2	0.400	-0.010
Jeff Hornacek	5	2	0.400	-0.014
Gary Payton	3	1	0.333	-0.017
Hersey Hawkins	3	1	0.333	0.018
Patrick Ewing	3	1	0.333	-0.007
Sean Elliott	3	1	0.333	-0.039
Mario Elie	3	1	0.333	-0.018
P. J. Brown	3	1	0.333	-0.007
Rik Smits	4	1	0.250	-0.020
Byron Russell	4	1	0.250	-0.015
Michael Jordan	4	1	0.250	-0.047
Avery Johnson	4	1	0.250	-0.014
Antonio Davis	4	1	0.250	-0.007
John Stockton	5	1	0.200	-0.042
Toni Kukoc	5	1	0.200	-0.031
Kobe Bryant	5	1	0.200	-0.053
Karl Malone	5	0	0.000	-0.076
Dennis Rodman	4	0	0.000	-0.091
Charles Oakley	4	0	0.000	-0.032
Detlef Schrempf	3	0	0.000	-0.030
Sam Perkins	3	0	0.000	-0.052
Allan Houston	3	0	0.000	-0.019

What of the primary candidate for “prime time” player, Jordan? Jordan had extended playoff experience in 1995, 1996, 1997, and 1998. Of the latter three seasons, Jordan’s team won the championship. In each of these seasons Jordan’s per minute productivity actually declined from his regular season performance. Only in 1995 did Jordan’s playoff performance meet the definition of prime time. In that season, though, Jordan’s team bowed out of the playoffs in the second round.

Conclusions

Fans often assert that a specific player is capable of elevating his play in the postseason. The perspective offered by researchers such as Simon, Kahneman, and Tversky suggests that fans may not be able to properly process the empirical evidence to the contrary. Our search failed to uncover evidence that the “prime time” player exists in the NBA. The analysis finds that players who perform well in the regular season also perform well in the playoffs, and we were unable to identify a player who could consistently exceed his regular season productivity. In the end, our results suggest that the prime time player is simply an additional aspect of the make-believe nature of sports.

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Notes

1. See Peach 2004 for a detailed discussion of Thorstein Veblen and sports.
2. The postseason, or playoffs, is the “tournament” that begins after the regular season ends. Only the best teams during the regular season can participate, and the team that wins every playoff series wins the championship.
3. Additionally, numerous other economists and scholars in the other social sciences have disputed the strong assumption of rationality offered by economists. This list of authors includes Amos Tversky and Daniel Kahneman (1974), George Akerlof and William Dickens (1982), Amitai Etzioni (1988), Douglass North (1994), and Roger McCain (1992), among others. For a review of the literature see Hosseini 1997.
4. For example, see Scully 1974, Medoff 1976, Raimondo 1983, Scott, Long, and Sompai 1985, Zimbalist 1992a and 1992b, Blass 1992, and Krautmann 1999.
5. This index was also employed in the work of Berri and Krautmann 2004, Lee and Berri 2004, Berri, Brook, Fenn, Frick, and Vicente-Mayoral forthcoming, and Berri and Schmidt 2004.

6. The work of David Berri (2004) indicates that this fraction is approximately 0.44, a result similar to the findings of Dean Oliver (2003) and John Hollinger (2003).
7. The regular season and playoff statistics for each player can be found at Bballsports.com.
8. For a univariate regression, $R^2 = (\text{correlation coefficient})^2$.
9. Often teams tighten their rotations in the postseason. In the regular season a team may play nine or ten players each night. As the games increase in importance, though, a coach will restrict his line-up to seven or eight players. DIFMGM is employed to see if these changes impact per minute productivity.
10. Sixteen teams make the playoffs each year. These teams are the eight teams with the best record in the Eastern and Western conferences. Each conference is divided into two divisions. A team is given a one seed if it has the best record in the conference. A two seed is given to the team leading the division not occupied by the best team in the conference. The remaining six teams are seeded in order of team winning percentage.
11. We also find that the lagged difference between playoff and season productivity does not significantly explain the current difference between playoff and season productivity. Additionally, Berri and Anthony Krautmann (2004) have found that the relationship between performance (PMIN) in successive regular seasons is very similar to the relationship that we report between the regular season and the postseason, suggesting players are as consistent from regular season to regular season as we observed from regular season to postseason.

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