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Box Score Metrics

- NBA efficiency ((Points + Rebounds + Assists + Steals + Blocks) - ((Field Goals Att. - Field Goals Made) + (Free Throws Att. - Free Throws Made) + Turnovers)). Shoot more than 34% more shots raises efficiency
- PER Rating-Game Score is highly correlated to John Hollinger's PER

- Game Score; the formula is PTS + 0.4 * FG - 0.7 * FGA - 0.4*(FTA - FT) + 0.7 * ORB + 0.3 * DRB + STL + 0.7 * AST + 0.7 * BLK - 0.4 * PF - TOV. Game Score was created by John Hollinger to give a rough measure of a player's productivity for a single game. The scale is similar to that of points scored, i.e., 40 is an outstanding performance, 10 is an average performance, etc. Shoot above 31% you increase Game Score with more shots
- Win Score (David Berri)

$$\textbf{Win Score = PTS + REB + STL + ½*BLK + ½*AST}$$

$$\textbf{− FGA − ½*FTA − TO − ½*PF}$$

  - Berri found the following "Hollinger has a simplified version of PERs called Game Score, and for the 2005-06 season I found a 98% correlation between NBA Efficiency and Hollinger's Game Score measure."

Adjusted +/- Player ratings

- +/- flawed by team strength
- Get set of player ratings that best fit scores of games. Predict per minute score of a time segment and weight squared errors by length of the segment.
- Two best in 2008-2009 Wade and Lebron. Wade is +20 point rating: +21 offense +1 defense while Lebron is +19 point rating, +14 offense, -5 defense.
- Theorem: Basketball is half offense and half defense: Box score metrics emphasize offense,
- **Underrated Lamar Odom +13 point rating (see below) . AI +11 point rating. Joe Johnson +10 point rating. Telfair (see below)**
- **Overrated: Kevin Martin, Kevin Durant, and Dahntay Jones. Look at Kevin Martin-his bad defense is often overlooked.**

Year	Points	Offense	Defense	PER
2006-2007	-3	6	+9	20
2007-2008	1	10	+10	21
2008-2009	-1	7	+8.	19

- Issues in Adjusted +/-.
    1. Multicollinearity: Mark Jackson and Travis Best-We have a proprietary fix for this. Correlations of -0.6 are common.
    2. Use one or two seasons?
    3. What to do with time segments that involve little used players?
    4. Results differ. We get Dirk +7 while Basketvalue.com gets Dirk to be -1.
    5. Impact rating: Use an alternate scoreboard.
- PER and Adjusted +/- are different. For 2008-2009 we find 0.36 correlation between PER and offense; .22 correlation PER and Defense, and 0.52 correlation between PER9999999999nd Points rating.

Lineup Ratings

- Suppose a lineup wins by 10 points per game. If average level of opposition is +5 points they get a +15 rating.
- Crucial in playoffs: what was Bulls best combo against Celtics? What was worst combo?
- Head to head lineups: Marquis Daniels did poorly against Manu. Devin Harris owned Tony Parker but Steve Nash owned Devin Harris and Parker owns Nash.

Explaining Odom's Rating (PER 17 Kobe's PER +24)

Most followers of the NBA think Lebron James and Kobe Bryant are the two best players in the NBA.

Well, there is pretty convincing evidence that Kobe Bryant may not be the best player on his own

team? If you look at how the Lakers play with various combinations of Odom and Bryant in and out of

the game during the 2009 playoffs it becomes clear that if Odom is not as good as Bryant, he

certainly is an outstanding player. Look at the following numbers:

- With Bryant and Gasol in and Odom out the Lakers were outscored by3 points in 320 minutes. After adjusting for the strength of opponents faced, the Lakers played 4 points better than an average team (per 48 minutes) during these 320 minutes.

- With **Bryant out** and Gasol and Odom in during the playoffs the Lakers outscored their opponents by 21 points in 86 minutes! After adjusting for the strength of opponents faced the Lakers played **13 points** better than an average team (per 48 minutes) during these 86 minutes.

- As expected, with Kobe, Gasol and Odom in during 535 minutes the Lakers outscored their playoff opponents by 165 points, playing 23 points (per 48 minutes) better than an average team.

So it looks like the fantastic Kobe Bryant could not make the Lakers outscore playoff opponents with Gasol in unless he had Odom in. On the other hand Odom and Gasol easily dominated their opponents without Kobe. Makes you question the "conventional wisdom"!

Why is Telfair Underrated? (PER of 11!)

On Tuesday July 21, 2009 the Timberwolves traded Sebastian Telfair to the Los Angeles Clippers. Most commentators believe the Wolves thought that draft picks Johnny Flynn and Rickie Rubio would be their great guards of the future. I am sure the Timberwolves did not realize that in Telfair they already had an outstanding point guard. Traditional NBA player metrics obscure Telfair's value. For example, in ESPN commentator's John Hollinger PER rating Telfair scored a 12.1 PER rating, well below the average PER rating of 15. My partner Jeff Sagarin and I have rated players and lineups for the Dallas Mavericks for 9 years. **We believe a player's value is based on how he helps the team play well or poorly; not his individual box score statistics.**

Let's look at how the Wolves2008-2009 performance varied based on Telfair's presence or absence in the game. The following table shows for each player on the team how the Wolves performance varies based on whether Telfair is in or out of the game.

	Telfair In	Telfair Out
Foye	3.2	−4.3
Jefferson	2.35	−4.89
Love	−2.54	−7.79
Miller	1.22	−7.87
Gomes	.88	−9.62

For example, when stud center Al Jefferson was in the game with Telfair, the Wolves played 2.35 points per game better than an average NBA team. However, when Jefferson was in the game and Telfair was out, the Wolves played 4.89 points worse than average. Looking at all numbers in the table makes it clear that Telfair has a very favorable impact of the Wolves team performance. Overall with Telfair in the Wolves were an average team while with Telfair out the Wolves played 7.35 points worse than average. The amazing thing is that Telfair makes under $3 million per season!

I hope this post convinces you that box score stats are only the tip of the iceberg!

Our rating system tells us that despite his poor statistical profile, during the 2008-2009 season Telfair played about 6 points per game better than an average NBA player.

Why did Cavs lose to the Magic?

While we work for the Dallas Mavericks rating players and lineups, after our Mavs were eliminated I rooted hard for Lebron and the Cavs. Like many others, I was very upset that the Cavs lost to the Magic and LeBron and Cleveland endured another year of frustration. **The Cavs did not have to lose this series.** The following two pieces of information tell us why they lost the series:

1. In the 57 minutes during which **Ben Wallace played and Joe Smith did not** the Cavs were clobbered by 58 points. Adjusting for the strength of the Magic players in the game during this time, the Cavs played 40 points (per 48 minutes) worse than an average NBA team.

2. In the rest of the series the Cavs dominated the Magic by 43 points in 236 minutes and played 18 points (per 48 minutes) better than average.

If the Cavs had played Joe Smith more with Wallace or had played Wallace less minutes, the NBA's dream Cavs-Lakers series might have become reality.