Football's Least Replaceable Players

by Greg Thomas

Originally my purpose was to write an article about how to use statistics to determine pro football's MVP in any given season. However, after doing the research and calculating the data, I discovered some things that completely changed the way I look at football.

Probably no year was as interesting statistically to me as 2003, at least as far as individual performances were concerned. There were superstar performances at every "numbers-oriented position."

Peyton Manning and Steve McNair posted superb passing statistics. Jamal Lewis, LaDanian Tomlinson, Priest Holmes, Ahman Green, and Clinton Portis all made like O.J. before he had ever even heard of Nicole. Randy Moss was Randy Moss, only better. Dante Hall returned two kickoffs and a pair of punts for touchdowns. Mike Vanderjaat didn't miss a field goal all year. Mitch Berger had a stellar punting season.

What is an MVP voter to do? Thanks to the authors of Football Prospectus,as well as their muses Bob Carroll, Pete Palmer, and John Thorn, who penned The Hidden Game of Football, the potential for football analysis has never been so good.

Sean Lahman and Todd Greanier of Football Prospectus coined a concept called "adjusted yards." They calculated adjusted yards from charting real NFL games, not fantasy football. Adjusted yards are figured in this manner: Take the yards a player gains from scrimmage and add 10 bonus yards for each touchdown scored while subtracting 35 yards for each interception thrown and 20 yards for each fumble. Both passing and receiving yards are divided between the passer and receiver, and the touchdowns produced by passing are also split between the two participants.

"Adjusted yards" is a great start. But what I wanted to do required an extra step. In the tradition of Baseball Prospectus, the folks who calculate how many runs a player is worth over his replacement, I wanted to determine how many extra yards a player was worth over a player that might take his place.

I used one standard deviation below the average starter's performance as my replacement level. Put another way, let's say your starting quarterback went down to injury. His hypothetical "replacement level" of one standard deviation below the mean would be better than 16% of current starters but worse than 84% of the guys who start games. This sounds fair to me as there are always some replacements that are better than the worst starters in the league.

Now let me show you how I calculated how many yards Peyton Manning surpassed a replacement-level quarterback. In 2003, Manning threw the ball 566 times for 4267 yards and 29 touchdowns while suffering only 10 interceptions. Manning's 4267 yards are divided in half (to avoid double entry with the receivers), his 29 touchdowns (also split with the receivers) are translated to

145 additional yards and his 10 interceptions are translated to 350 yards to be subtracted. This leaves Manning with 1928.5 adjusted yards which are divided by the his 344 attempts yielding an average of 3.41 yards adjusted yards per attempt. This 3.41 figure was 1.64 yards above the 1.77 replacement level passing figure. Multiplying 1.64 times 566 attempts yields 928 passing yards over replacement level.

However, this doesn't deal with Manning's rushing. Manning ran the ball 26 times for an average of 0.93 yards per carry. Manning's yards per carry were -.79 beneath the replacement level for quarterbacks; so with his 26 carries, he lost 21 yards more than a replacement-level quarterback.

Also, we must keep in mind Manning's ability to avoid sacks and fumbles. In 2003, Manning was sacked 28 times for 107 yards. He also fumbled six times which costs him 120 adjusted yards. This means Manning lost 227 adjusted yards due to sacks and fumbles. Because Manning was involved in 613 plays (other than receiving, which is considered separately), this averages to 0.37 yards lost to sacks and fumbles per play. This was much better than the replacement-level average of 0.89. Multiplying the difference of 0.52 times 613 plays gives Manning an additional 319 yards over a replacement-level quarterback.

Finally, Manning was targeted for one pass. He caught the pass but lost 2 yards. The replacement-level average for backs catching passes was 2.15 yards per pass targeted, this netting Manning a negative four yards.

Now let's put all these numbers together. Manning gains 928 over a replacement-level quarterback for his passing but loses 21 for his rushing. He has an edge of 319 for his ability to avoid sacks and fumbles but loses 4 for his receiving. Add these figures up and Peyton Manning was 1222 yards better than a replacement-level quarterback. Only two other quarterback's topped the 1000-yard figure. They were Kansas City's Trent Green (1132 yards) and Minnesota's Dante Culpepper (1001). Manning's co-MVP, according to the Associated Press, Steve McNair was 948 yards above replacement-level.

What about a superstar runner like Jamal Lewis. In 2003, Lewis ran the ball 387 times for 2066 yards and 14 touchdowns, while fumbling 8 times on his way to becoming the Associated Press Offensive Player of the Year. These numbers translate to 2046 adjusted yards. Dividing 2046 by 387 yields 5.29 which is 1.65 yards above the rate of a replacement-level back. Multiplying 1.65 by 387 carries means that Lewis ran for 639 more yards than a replacement-level back.

Lewis also was the target for 38 passes in 2003. He caught 26 for 205 yards with no fumbles and no touchdowns. This translates to 2.70 yards per targeted pass which is .55 yards above the rate of a replacement level running back. Multiplying .55 by 38 means that Lewis' receiving numbers were 21 yards better than a replacement-level back.

Adding together Jamal Lewis rushing (639 yards) and receiving (21 yards) totals show him to be 660 total yards better than replacement level. This total of 660 is only slightly greater than half of Peyton Manning's worth. In fact, LaDanian Tomlinson (694) Ahmed Green (680 yards), and Clinton Portis (662 yards) all had higher totals than Lewis while Priest Holmes (655) almost matched him. Still, the top running backs half only slightly more than half the value of the top passers.

What about receivers? Randy Moss had a killer year for a wideout. He garnered 1632 yards and 17 touchdowns with only 4 fumbles while being targeted on 172 passes. Keep in mind, quarterbacks and receivers have to share their yardage totals so Moss ended up with 881 adjusted yards. Dividing 881 by 172 yields 5.12 yards per times per targeted pass which was 2.06 yards above a replacement-level wideout. Multiplying 2.06 yards by 172 yards means that Moss' pass receiving was worth 354 yards above replacement level. Moss also had some limited running, passing, and kick return actions which lowered his overall total to 350 total yards above the replacement- level wide receiver.

Now compare these figures: Manning 1220, Tomlinson 694, and Moss 350. Bizarre! This indicates that when a quarterback has an outstanding year, he is worth almost twice as much as a superstar running back and more than three times more than a superstar wide receiver. But, trust me, I'm not done shocking you yet!

We all marvel that Mike Vanderjaat didn't miss any of field goals, and you may wonder how valuable he was? The answer is very valuable but not nearly as valuable as his pro bowl opponent Jeff Wilkens.

Vanderjagt, was rated against replacement-level kickers on extra points, and field goals categories of 0-29 yards, 30-39 yards, 40-49 yards and 50-plus yards. His kicking was 33.457 points better than replacement level. According to Football Prospectus, a point is worth 13.35 adjusted yards. Thus Vanderjagt's field-goal kicking was worth 447 extra yards.

However, the hidden and most important category in comparing kickers however is kickoff distance. While Vanderjagt averaged almost a yard more than replacement-level kickers on his 97 kickoffs, Wilkens 95 kickoffs were more than five and a half yards better than replacement level.

Thus, when all was said and done, Wilkens, who was almost as accurate on field-goal attempts as Vanderjagt, and whose attempts were for the most part from longer distances, ended up an amazing 972 yards above replacement level as opposed to Vanderjagt's grand total, including kickoffs, of 538 yards. In fact, two other kickers, both of whom were great on kickoffs, had greater value than Vanderjagt, Jason Hanson (669) and Orlando Mare (666). Look at these totals! Elite kickers are the equal of elite running backs and worth twice as much as elite receivers.

In fact, the best punter, using net punting average as the metric, Shane Lechler (355 yards above replacement level) was essentially equal to the league's best receiver Randy Moss (350 yards above replacement level) and of much greater worth than football's top tight end, Kansas City's Tony Gonzalez who was worth a mere 213 yards better than a replacement-level performer at his position.

Finally, a word about the dynamic Dante Hall, who found the end zone on four returns this year. His numbers break down as follows: 308 above replacement level on punt returns, 306 yards above replacement level on kickoff returns, 15 yards above replacement level rushing, and 13 above replacement level receiving. Hall had a total of 642 yards above replacement level which means his overall value almost matched the elite running backs and was approximately double the elite receivers.

So what do I conclude from this study. Mainly that I had been living in a world of statistical misconceptions when it came to football numbers. I had long believed, maybe you too, that the best quarterback and the best running back in any given year had approximately equal value. However, the truth in real life, is not necessarily the same as fantasy, just as the truth in real football is not the same as fantasy football. So keep these facts in mind:

1. In this era of postmodern football, a good quarterback has more value than a great running back. For example, Aaron Brooks, merely a good quarterback with 863 yards above replacement level was much more valuable than any of the great running backs in 2003 (Tomlinson, Lewis, etc.).

Utlimately, this means that the MVP in any season should be the league's best quarterback, no matter what numbers a running back posts.

2. Wide Receivers have minimal value compared to quarterbacks and running backs, even when they put up big numbers. In fact, a good punter can mean just as much to a team.

3. No one is more underrated than a great kicker. They truly put the "foot" in football. A great kicker, provided that he excels at both field goals and kicking off, has more value than anyone save a superstar QB.

No one was more shocked with these findings than me. Before now, I had been living in the land of fantasy football, not the real thing.