A New Quarterback Rating System

by Michael Neft

The passer rating system currently employed by the NFL may be one of the most meaningless statistics currently used in any sport today. This system measures the quarterback's passing ability in four different categories: completions, yards, touchdowns, and interceptions. These four categories are weighted against league averages and then combined to reach a final number. In their book *The Hidden Game of Football*, Bob Carroll, Pete Palmer and John Thorn broke down the NFL formula to find out that in this system, yards per attempt are used as the base of the rating, while each passer is awarded a 20 yard bonus for a completion, an 80 yard bonus for a touchdown, and a 100 yard penalty for an interception. I agree with these authors in finding that these bonuses and penalties do not accurately reflect how well a quarterback has been passing the ball. Furthermore, while this system only claims to measure a quarterback's passing ability, it ends up being used in effect as a way of rating quarterbacks. When used in this manner, this system is highly deficient as it refuses to take into account many other important aspects of being a quarterback, like rushing statistics, times sacked, and fumbles. For this reason, I have come up with a new way to fully rate a quarterback's performance.

To change this system, we first need to base it upon a real statistic, like yards gained per play. Then, we need to find appropriate bonuses and penalties for special plays like touchdowns and interceptions. Unlike the current system, however, the best thing to do is to see how much each of these special plays actually mean in terms of a common denominator, for example, yards gained. For this, I again turn back to The Hidden Game of Football, in which Carroll, Palmer, and Thorn find that on average, a point is worth 12 yards, and an interception is worth negative 45 yards. We can take the interception yards and use it as is. For touchdowns, however, we need to do a little work. Since one point is worth 12 yards, then a touchdown is worth 84 yards. However, if the average return of a kickoff is 26 yards, the net gain is then 48 yards. Furthermore, 27 yards must be subtracted from that total, representing the yards given for each made field goal, assuming that in most cases if the quarterback failed to lead the team for a touchdown, at least they would have succeeded in kicking the field goal. Thus, I arrived at the final result of a bonus of 31 yards for each touchdown.

A bonus for completions is a meaningless idea. A completion in and of itself means nothing in terms of the game. Under the old system a loss of five yards on a completion gives the passer 15 points (20 for the completion and 5 for the yards gained). That's just ridiculous. So, no bonus for completions.

Still, this new system is not a complete rating of the quarterback. Some quarterbacks are known as being more mobile than others, either in terms of rushing with the ball or avoiding sacks. Both of these functions of a quarterback influence his passing statistics. An incomplete pass is better than a sack, but under the present system the passer would be penalized for the incomplete pass but not for the sack. So, we add sacks to attempts and subtract the yards sacked from the total yards passed for. In addition, a quarterback's running game should also be included to a rating of their performance, so we must add the yards gained to the total yards, rushing attempts to total attempts, and the bonus of 31 yards for each rushing touchdown. Furthermore, a quarterback should be punished for fumbling the ball. According to Carroll, Palmer and Thorn, the average turnover costs 50 yards, and the average quarterback fumble occurs 8 yards behind the line of scrimmage for a total loss of 58 yards. However, it is possible for a quarterback to fumble the ball, and then to recover his own fumble. For that reason I have subtracted fumbles recovered from times fumbled to come up with the number of times the quarterback has fumbled away the ball.

So, we have now come to our final quarterback rating, which looks like this:

$$\frac{\text{(Total Yards)+(Total TDx31) -(INTx45) -(Fumbles x 58)}}{\text{(Attempts+Sacks+Rushes)}}$$

in which Total Yards is yards passed for, yards rushed for and yards sacked; Total Touchdowns is touchdowns passed for and rushed for, and Fumbles is total fumbles minus fumbles recovered.

Looking at this system for all 1991 quarterbacks who had at least 100 attempts, we find that the top three spots, occupied by Young, Rypien and Kelly, have remained in the same order, yet the differences between them have changed dramatically. In addition, the numbers four and five quarterbacks under the NFL system, Kosar and Simms, have fallen to fourteenth and tenth respectively. Why this fall? In Kosar's case, the main culprit is sacks, namely 41 sacks for a loss of 232 yards. In addition, the main reason he was fourth in the old system was due to his high completion percentage (62.1%) even though his yards per attempt is only 0.13 of a yard above the average quarterback. For Simms, he moved down simply because he was nothing special last year, as New York Giants fans will attest to. In general, the system stayed very much the same, with the top three not moving and the bottom five experiencing a switch only between the fourth and fifth worst.

Another important bonus for this system is that it means something. Whereas the old system was merely a number of comparison, this rating actually has a measurable value, yards per play. For example, under this new system, Steve Young is worth 8.49 yards per play, while Stan Gelbaugh is only worth 0.64 yards a play. Thus it is a lot easier to understand why one quarterback is ranked over another, and what each one actually adds to their team. Furthermore, by ranking them according to statistics rather than comparing them against that year's league average, it is a lot easier to compare quarterbacks from different years.

I was able to find the necessary data for the 1983 and 1984 NFL seasons as well, and here the value of year to year contrasts becomes important. In 1984, Dan Marino had one of the best year a quarterback has ever had. He completed 362 of 564 passes, a 64.2% completion rate, passed for 5,084 yards, a 9.01 yards per attempt average, threw for 48 touchdowns, and had 17 passes intercepted for a NFL rate of 108.9. He also ran 28 times for -7 yards, had no rushing touchdowns, was sacked 13 times for a loss of 120 yards, and lost 4 fumbles. Under the new system he had a rating of 9.04. This rating is 0.55 points higher than anybody else's in either the 1983, 1984, or 1991 season coming in third with an 8.08 rating. That difference of 0.55 points comes into perspective when for the 1991 season, the difference between Rich Gannon and Warren Moon tied for eleventh at 5.69 and Rodney Peete, listed seventeenth with a rating of 5.13. Their difference of 0.56 covers seven places in only one year, while almost the exact same amount covers the difference between first and second place over three years, truly demonstrating how great Marino's year was.

In sum, I believe this rating system to be more representative, more accurate, and a better measure of good quarterbacks than the one currently employed by the NFL. It does not measure how good a quarterback is individually, because he is always dependent on his receivers catching his passes, a line blocking for him, how good his running game is to open up the field for him, whether his coach lets him pass, and other such factors. Unfortunately, no rating system can overcome these problems. However, I think this one does the best it can to rate the quarterback, fully using, for the most part, readily accessible data.

HOW THE NFL HAS RANKED PASSERS THROUGH THE YEARS

1932-37 - Passers ranked by total yards passing.
1938-40 - Passers ranked by completion percentage.
1941-43 - Passers ranked by inverse ranking of completions and completion percentage.
1944-48 - Passers ranked by inverse ranking of total completions, yards gained, touchdowns, interceptions (low), completion percentage, and interception percentage.
1949 - Same except numberof interceptions no longer included.
1950-59 - Passers ranked by average gain per attempt.
1960-61 - Passers with an average of at least ten passes per game ranked by inverse ranking of total completions, total yards, total touchdowns, completion percentage, interception percentage, and average gain.
1962-71 - Passers ranked by inverse ranking of completion percentage, total touchdowns, interception percentage, and average gain.
1972 - Percentage of touchdowns replaced total touchdowns.
1973 - Present system begins.