Sports Reference Blog

SRS Calculation Details

Posted by Mike Lynch on March 3, 2015

One of the more common subjects for queries we receive at Sports-Reference is our SRS (Simple Rating System) figures. For some background, the first of our sites to add SRS was Pro-Football-Reference, when Doug Drinen added it to the site in 2006 and provided this excellent primer. The important thing to know is that SRS is a rating that takes into account average point differential and strength of schedule. For instance, the 2006-07 Spurs won games by an average of 8.43 points per game and played a schedule with opponents that were 0.08 points *worse* than average, giving them an SRS of 8.35. This means they were 8.35 points better than an average team. An average team would have an SRS of 0.0. The calculation can be complicated, but the premise is simple and it produces easily interpreted results.

However, there are some variations in the way we calculate SRS across our various sites. We'll break down these differences below.

Pro-Football-Reference.com SRS: PFR's SRS is unique in that a home-field advantage is included as a part of the calculation because of the short schedule compared to the other sports (we don't want a team to look relatively weak at the halfway point because they've only played 3 of their first 8 at home, for instance). This HFA fluctuates yearly based on game results, but it is generally somewhere between 2 and 3 points (2006 being an outlier, as you'll see). Below is a look at the HFA numbers we have used since 2001. If you'd like to calculate these HFAs yourself, just sum up every team's home point differential and then divide by the total number of games played across the league that season. This data can easily be found in the Play Index for each season:

2001: 2.0081
2002: 2.2461
2003: 3.5547
2004: 2.5078
2005: 3.6484
2006: 0.8477
2007: 2.8672
2008: 2.5586
2009: 2.2070
2010: 1.8945
2011: 3.2656
2012: 2.4336
2013: 3.1055
2014: 2.4883

College Football SRS: Our CFB SRS does not contain a home-field advantage element, but it does have some other quirks. Most importantly, we have capped the margin of victory considered for the formula. Due to the number of mismatches seen in college football, the maximum point differential a team can be credited with in a game is 24. We also credit all wins as a minimum of plus-7 margin of victory (so if you win by 1 point, it's treated the same as a 7-point win). The same logic is applied to losses, as well. One other wrinkle for CFB is that all non-major opponents are included as one team for the sake of the ratings.

College Basketball SRS: SRS for college hoops is straight forward (no HFA & no adjusted MOV), but one item to note is that games against non-major opponents *are not counted* in our calculations.

MLB, NBA & NHL: All of these SRS calculations are straight forward with no adjustments for HFA and no capping of MOV. It should be noted, however, that no special consideration is given for extra-innings, overtimes or shootouts, either.

We'll close with a quick rundown of the various merits and weaknesses of SRS, from Drinen's original 2006 post. These bullet points were created to describe the system used for NFL SRS, but many of the strengths and weaknesses can applied to the other sports, as well:

The numbers it spits out are easy to interpret - if Team A's rating is 3 bigger than Team B's, this means that the system thinks Team A is 3 points better than Team B. With most ranking algorithms, the numbers that come out have no real meaning that can be translated into an English sentence. With this system, the units are easy to understand.

It is a *predictive* system rather than a *retrodictive* system - this is a very important distinction. You can use these ratings to answer the question: which team is stronger? I.e. which team is more likely to win a game tomorrow? Or you can use them to answer the question: which of these teams accomplished more in the past? Some systems answer the first questions more accurately; they are called predictive systems. Others answer

the latter question more accurately; they are called retrodictive systems. As it turns out, this is a pretty good predictive system. For the reasons described below, it is not a good retrodictive system.

It weights all games equally - every football fan knows that the Colts' week 17 game against Arizona was a meaningless exhibition, but the algorithm gives it the same weight as all the rest of the games.

It weights all points equally, and therefore ignores wins and losses - take a look at the Colts season. If you take away 10 points in week 3 and give them back 10 points in week 4, you've just changed their record, but you haven't changed their rating at all. If you take away 10 points in week 3 and give back 20 points in week 4, you have made their record worse but their rating better. Most football fans put a high premium on the few points that move you from a 3-point loss to a 3-point win and almost no weight on the many points that move you from a 20-point win to a 50-point win.

It is easily impressed by blowout victories - this system thinks a 50-point win and a 10-point loss is preferable to two 14-point wins. Most fans would disagree with that assessment.

It is slightly biased toward offensive-minded teams - because it considers point margins instead of point ratios, it treats a 50-30 win as more impressive than a 17-0 win. Again, this is an assessment that most fans would disagree with.

This should go without saying, but - I'll say it anyway. The system does not take into account injuries, weather conditions, yardage gained, the importance of the game, whether it was a Monday Night game or not, whether the quarterback's grandmother was sick, or anything else besides points scored and points allowed.

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Mike Lynch Says: March 5th, 2015 at 2:46 pm
Mike: Here's our article on calculating PER: http://www.basketball-reference.com/about/per.html

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