

Batted Ball Fielding Stats

by Dave Studenmund

I've noticed a disturbing trend in baseball columns these days. More and more writers are referring to something called Defense Efficiency Ratio (or DER) to describe a team's fielding prowess. This is disturbing to me, because DER has some serious flaws.

The calculation for DER, which was introduced by Bill James over 20 years ago, is relatively simple. Take all the balls in play given up by a pitching staff (batters faced minus strikeouts, walks, batters hit by pitches and home runs) and then figure out how often the team's fielders recorded an out off those balls in play. The second part is a little tricky, because you don't want to include outs that occurred in other ways, such as a runner caught stealing or the first out of a double play. But you can usually find a way to get the right stats.

It's true that good fielders get to more balls than bad fielders. But it's also true that many other things can affect DER, such as:

- The ballpark. Try catching an easy flyball 15 feet up the Green Monster in Fenway.
- The type of batted ball. Line drives are hard to catch; infield flies are easy. Outfield flies, groundballs and bunts are in-between.
- Where the ball goes. Balls in the shortstop hole are harder to field than balls hit directly at the shortstop. I won't name names.
- How hard the ball is hit. Even Rafael Furcal will have trouble with a ball hit hard in the shortstop hole.

So when you see a columnist use DER to announce that one team's fielders are better than another's, you should be skeptical. It's not that DER is wrong; it's just not always right. Let me give you an example.

Last year, the Yankees' DER was .691, according to our stats from *Baseball Info Solutions*; 69% of qualified batted balls were fielded for outs. That would place the Yankee fielders slightly below the major league average DER of .695. But the Yankee fielders were actually much worse than that.

You see, the much-maligned Yankee staff actually yielded the most fieldable batted balls in the majors last year. If you add up all of their batted-ball types and assume that each type was turned into an out at the average major league rate, their DER would be .721. So when judging the Yankee fielders, you should compare them to .721, not .695.

Luckily, *The Hardball Times* can help. We used our batted-ball data to develop better fielding stats for 2005, and we found that the Yankees were actually the third-worst fielding team in the majors last year.

Here's what we did.

- We added up the number of batted balls allowed by each team's pitching staffs. The Yankees allowed 2,161 groundballs, 1,280 outfield flies (not including home runs), 798 line drives (also not including home runs), 188 infield flies and 57 bunts for a total of 4,484 batted-balls in play.
- We then applied the major league average out percentage for each type of batted ball (such as 99% for infield flies and 25% for line drives) to each total to generate the number of expected outs from the batted balls. We also adjusted the out percentage for each team based on the ballpark factors discussed in the previous article. (The fielding impact of Yankee Stadium is pretty small). This produced a total of 3,235 expected outs off those batted balls.
- Next, we compared the expected total to the actual number of batted balls turned into outs: 3,146, or 89 fewer than expected.
- Finally, we converted each unfielded ball into a run value, based on how often each type of batted ball hit is a single, double or triple, on average. As you can imagine, an unfielded outfield fly does more damage than an unfielded bunt.

We're still missing two important elements, where the ball was hit and how hard it was hit. But with just the stats we have, we find that Yankee fielders allowed 51 runs below average. When you consider that every nine-to-ten runs equal a win, this means that their fielders cost them at least five wins compared to the average major league team.

I don't mean to pick on the Yankees; they're just the example I chose. Actually, the Reds (57 runs below average) and Royals (67 runs below average) were worse. The best fielding teams were the Indians (49 runs above average), Athletics (46) and Phillies (40). The difference between the best (Cleveland) and worst (Kansas City) fielding teams was 116 runs.

To put that in perspective, the difference between the best and worst defensive teams (pitching and fielding) last year was 302 runs. (Tampa Bay allowed 936

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runs and the Cardinals allowed 634.) Pitching is still the most important aspect of total defense, but fielding matters too.

The following table has more information than you can shake a stick at. By team, it shows the number

of runs allowed above/below average for each type of batted ball and in total, as well as each team's rank in DER and their fielding runs above/below average in 2004. Let me lay it out for you and add comments afterward:

DER			Fielding Runs Above/Below Average							2004	Diff
Rank	Rank	Team	IF	OF	LD	GB	Bunt	Total			
1	3	Indians	0.10	22.52	21.52	4.19	0.76	49.09	-11.1	60.2	
2	1	Athletics	0.58	9.41	13.48	22.11	0.40	45.97	4.7	41.3	
3	5	Phillies	0.05	13.50	5.76	20.85	-0.11	40.04	0.1	39.9	
4	2	White Sox	-0.38	21.23	4.53	13.78	0.64	39.79	5.0	34.8	
5	4	Astros	-0.06	5.35	9.21	21.00	1.33	36.82	-4.6	41.4	
6	19	Braves	-1.06	24.66	4.81	-3.43	0.87	25.84	17.1	8.7	
7	8	Mets	0.47	19.29	-11.55	12.58	4.03	24.81	29.7	-4.8	
8	11	Cubs	-0.09	6.97	11.60	2.08	3.22	23.79	19.8	3.9	
9	6	Cardinals	-0.61	-17.26	2.86	27.61	3.48	16.08	39.8	-23.7	
10	10	Blue Jays	-0.45	7.64	-6.88	15.51	-0.77	15.05	8.7	6.4	
11	20	Orioles	-0.48	12.09	6.06	-7.07	-3.67	6.94	-14.3	21.3	
12	15	Brewers	0.56	-3.75	11.61	-2.05	0.29	6.65	1.9	4.7	
13	18	Pirates	0.55	-16.35	2.75	20.26	-1.70	5.51	-13.5	19.0	
14	16	Nationals	0.15	-5.00	9.42	-3.17	0.82	2.22	15.9	-13.7	
15	7	Twins	0.12	-3.73	-6.63	9.83	2.16	1.75	-23.5	25.3	
16	12	Dodgers	-0.96	3.19	-5.44	-2.19	4.61	-0.80	28.6	-29.4	
17	14	Giants	-0.29	-8.38	7.33	-3.15	3.17	-1.33	0.5	-1.8	
18	9	Mariners	0.58	15.72	-5.17	-17.88	-0.74	-7.49	9.0	-16.5	
19	23	Diamondbacks	0.00	-12.70	-1.71	4.00	2.09	-8.33	3.9	-12.2	
20	22	Padres	0.04	-10.05	-3.43	4.93	-2.13	-10.64	5.0	-15.6	
21	17	Tigers	0.55	-2.15	-7.25	0.04	-2.24	-11.04	-21.7	10.6	
22	13	Angels	0.08	-10.73	-0.18	4.93	-6.71	-12.61	-40.5	27.9	
23	24	Red Sox	-0.34	2.31	-17.71	-0.44	-0.86	-17.04	18.5	-35.5	
24	26	Rangers	0.51	4.52	5.31	-32.48	-2.51	-24.65	-3.6	-21.0	
25	25	Devil Rays	0.13	7.83	-3.99	-26.99	-2.71	-25.73	10.5	-36.2	
26	29	Rockies	-0.03	-11.61	-10.19	-3.07	-2.31	-27.21	-33.3	6.1	
27	27	Marlins	0.07	-13.54	-2.88	-14.74	3.82	-27.28	12.5	-39.8	
28	21	Yankees	0.56	-25.62	2.05	-24.00	-3.68	-50.69	-32.8	-17.9	
29	28	Reds	-0.37	-27.16	-18.86	-9.82	-0.56	-56.75	-4.6	-52.1	
30	30	Royals	0.02	-14.89	-16.41	-35.24	-0.97	-67.49	-32.2	-35.3	

It's really not that bad; let me point out a few things.

The first two columns show each team's rank in Fielding Runs Above/Below Average—let's just call it FRAA for this article—and its rank in DER. As you can see, DER is close, but it misses badly on a few teams, such as the Braves, Orioles, Mariners, Angels and Twins.

The five middle columns show each team's FRAA by batted-ball type. This allows you to say a few things about each team's outfield and infield defense.

Outfields

- The Braves, with Andruw Jones in center and Jeff Francoeur in right, had the best outfield in the majors last year. The Indians and White Sox also had great outfields.
- On the other hand, the worst outfields were the Reds' and Yankees'. Bernie Williams' outfield limitations are fairly well known, but it appears that Mr. Griffey Jr. has lost his outfield panache as well.

Infields

- Even though the Cardinals' infield almost had a complete turnover this year at second, shortstop and third base, they still had the best infield defense in the majors. Findings like this make you wonder if the ballpark is having some sort of impact, but no such impact is apparent in the data.

- There were a number of other fine infields last year, including the A's, Astros, Phillies and Pirates.
- The Royals' and Rangers' infields were truly terrible in 2005. A number of teams had big differences between their infields and outfields, but the Royals were really, really bad in both.

By the way, research shows that when line drives are caught for outs, the outfield accounts for a little more than half of those outs. This makes it tough to say whether a good record at turning line drives into outs is the result of good plays by the outfield or infield, or just plain good luck.

The last two columns list each team's 2004 Fielding Runs, as well as the difference between this year and last. The team with the greatest improvement from 2004 to 2005 was the Cleveland Indians, the best story in the American League the second half of the season. During the Indians' mad run for the Wild Card slot, a lot of attention was paid to their improved pitching and second-half hitting. Not many people mentioned their improved fielding.

In retrospect, it should have been obvious. The Indians allowed 857 runs in 2004 and only 642 in 2005—a difference of 215 runs. It's hard to make that much of an improvement in pitching alone. Indeed, the Indians' fielders contributed 60 of that 215 run difference.

So here's a salute to the Indians' reconfigured outfield of left fielder Coco Crisp, center fielder Grady Sizemore and right fielder Casey Blake. I nominate them for the unsung fielding heroes of 2005.