

*BABE*: THE SULTAN OF PITCHING STATS?  
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## **BABE: THE SULTAN OF PITCHING STATS?**

“I Got You Babe”

— Sonny & Cher, 1965

There is no shortage of baseball metrics. Perhaps the most popular measure of pitching performance is the earned run average (ERA). ERA is equal to the number of earned runs a pitcher gives up in a nine-inning game. An alternative measure of pitcher performance is the number of walks plus hits allowed by a pitcher divided by the number of innings pitched (with the acronym WHIP). Since singles and extra-base hits are treated alike, WHIP is somewhat flawed. A relative newcomer to the fan’s kitbag of statistical tools is the BABE, which unlike WHIP, adds the number of total bases a pitcher gives up to the number of walks allowed and divides this sum by the number of batters faced.<sup>1,2</sup> More precisely, the BABE is given by:

$$\frac{TB + BB}{AB + BB}$$

where TB denotes the opposing team’s total bases, BB is the opponent’s bases on balls or walks, and AB represents the opponent’s number of at bats. The lower the BABE, the better the pitcher’s performance.

In this brief research note, we examine all 369 games in all World Series played between 1946 and 2009. Postseason data on total bases, walks, and at bats (gleaned from the box scores) of each game for each team each year are from [www.baseball-reference.com](http://www.baseball-reference.com). How well does this defensive measure alone predict outcomes? Were the BABEs of winning teams in the World Series significantly lower than the BABEs of their opponents? Did the series (or individual game) winner have the lower BABE more than half the time? And, have the BABEs of winning or losing teams in the World Series changed between the pre-free agency (1946-1976) and post-free agency (1977-2009) periods?

Table 1 shows the BABEs of the eventual winner and loser in each World Series between 1946 and 2009. Of the 63 World Series, the eventual series winner had the lower BABE two-thirds of the time. All but one of the 21 exceptions (11 American League or AL series winners, 10 National League or NL series

winners) involved a 6- or 7-game series. Table 2 shows that in four-game sweeps or a World Series that ended in only five games, the eventual series winner (both before and after 1977, the beginning of free agency) had significantly lower average BABEs.<sup>3</sup> In a 6- or 7-game series, the average BABEs of winners and losers were indistinguishable (at the .05 level of significance). Between 1946-1976 and 1977-2009, the BABEs of losing teams (regardless of the length of the series) generally rose, especially for teams that were swept in four games.

Of the 369 games played in a World Series between 1946 and 2009, an individual game winner had the lower BABE 83.2 percent (or 307/369) of the time.<sup>4,5</sup> Table 3 shows that individual game winners had significantly smaller BABEs than game losers over the entire 64-year period, as well as in the two shorter sub-periods. One would think that managers used relief pitchers more frequently between 1977 and 2009 than they did in the earlier period (when starting pitchers were expected to pace themselves for a full game). That is, the rise in relief pitching should have a negative impact on the opponent's long-ball hitting. BABEs should be lower now than they were before. Yet, BABEs of winners and losers are, on average, significantly higher in the 1977-2009 period than they were in the earlier period, especially for AL winners and NL losers. Finally, there appears to be little (if any) home field impact on BABEs. The BABE of a home win (loss) is no different from the BABE of a road win (loss) [ $p = .750$  ( $p = .945$ )]. Curiously, in the more recent period, when NL teams lose on the road (playing in an AL ballpark under AL rules which allow for designated hitters), the average BABE of NL team losers is significantly higher than the average BABE of AL team losers ( $p = .033$ ).

### **Concluding Remarks**

For pitchers, games won per season, the strikeout-to-walk ratio, and ERA are among the performance measures that first come to mind. WHIP is less common. And, the newborn BABE (bases per batter) is shown to be closely related to club wins in World Series play. In particular, the BABEs of winning teams in the World Series were significantly lower than the BABEs of losing teams since 1946, both before and after free agency, a result that underscores the belief that pitching wins championships.

**Table 1. BABEs, World Series, 1946-2009**

<i>Year</i>	<i>Number of Games</i>	<i>Winner's Affiliation</i>	<i>Winner's BABE<sup>1</sup></i>	<i>Loser's BABE</i>	<i>Year</i>	<i>Number of Games</i>	<i>Winner's Affiliation</i>	<i>Winner's BABE<sup>1</sup></i>	<i>Loser's BABE</i>
1946	7	NL	.3882	.4183	1978	6	AL	<i>.4475</i>	.4244
1947	7	AL	.3906	.5000	1979	7	NL	.4015	.4719
1948	6	AL	<i>.3793</i>	.3399	1980	6	NL	<i>.5279</i>	.4444
1949	5	AL	.3955	.4121	1981	6	NL	<i>.4734</i>	.4450
1950	4	AL	.3037	.3649	1982	7	NL	.4436	.4566
1951	6	AL	.3927	.4489	1983	5	AL	.3373	.4080
1952	7	AL	.3852	.4563	1984	5	AL	.4011	.4890
1953	6	AL	.5175	.5398	1985	7	AL	.3248	.4470
1954	4	NL	.3791	.4014	1986	7	NL	<i>.4601</i>	.4330
1955	7	NL	.4467	.5000	1987	7	AL	.3551	.4869
1956	7	AL	.3765	.4840	1988	5	NL	.3086	.4389
1957	7	NL	<i>.4325</i>	.4089	1989	4	AL	.3803	.6280
1958	7	AL	.4045	.4213	1990	4	NL	.3605	.5223
1959	6	NL	<i>.4292</i>	.4233	1991	7	AL	<i>.4764</i>	.4466
1960	7	NL	<i>.5575</i>	.3862	1992	6	AL	.3591	.4159
1961	5	AL	.3371	.5132	1993	6	AL	.5041	.5628
1962	7	AL	<i>.3866</i>	.3388	1994	<sup>2</sup> *	*	*	*
1963	4	NL	.2687	.4063	1995	6	NL	.3818	.4862
1964	7	NL	<i>.4773</i>	.4186	1996	6	AL	<i>.4330</i>	.3689
1965	7	NL	.3846	.4211	1997	7	NL	<i>.5122</i>	.4965
1966	4	AL	.2707	.3969	1998	4	AL	.4247	.5409
1967	7	NL	<i>.4059</i>	.3984	1999	4	AL	.3517	.4667
1968	7	AL	.4462	.4535	2000	5	AL	.3817	.4804
1969	5	NL	.2791	.3600	2001	7	NL	.3347	.4335
1970	5	AL	.4078	.5602	2002	7	AL	<i>.5547</i>	.5112
1971	7	NL	.3556	.4167	2003	6	NL	<i>.4629</i>	.3456
1972	7	AL	<i>.3725</i>	.3568	2004	4	AL	.3623	.5556
1973	7	AL	<i>.4007</i>	.3829	2005	4	AL	.4063	.5325
1974	5	AL	<i>.4023</i>	.3924	2006	5	NL	.3669	.4254
1975	7	NL	.4424	.4461	2007	4	AL	.3916	.5813
1976	4	NL	.3401	.5616	2008	5	NL	.3554	.5538
1977	6	AL	<i>.4554</i>	.4398	2009	6	AL	<i>.5273</i>	.4491

<sup>1</sup>Numbers in italics indicate that the winner's BABE was greater than the loser's BABE (occurred 21 times, 11 AL winners, 10 NL winners).

<sup>2</sup>The 1994-95 strike caused the cancellation of the 1994 World Series.

**Table 2. Difference between BABEs,  
by Length of Series, 1946-2009**

<i>Group 1</i>	<i>Group 2</i>	<i>Average BABE</i>		<i>p-value on difference<sup>1</sup></i>
		<i>Group 1</i>	<i>Group 2</i>	
4-game series				
Winner	Loser	.3533	.4965	<.001
Winner, 1946-1976	Loser, 1946-1976	.3124	.4262	.015
Winner, 1977-2009	Loser, 1977-2009	.3825	.5467	<.001
5-game series				
Winner	Loser	.3611	.4576	<.001
Winner, 1946-1976	Loser, 1946-1976	.3644	.4476	.042
Winner, 1977-2009	Loser, 1977-2009	.3585	.4659	.002
6-game series				
Winner	Loser	.4494	.4381	.738
Winner, 1946-1976	Loser, 1946-1976	.4297	.4380	.356
Winner, 1977-2009	Loser, 1977-2009	.4572	.4382	.788
7-game series				
Winner	Loser	.4199	.4381	.092
Winner, 1946-1976	Loser, 1946-1976	.4149	.4240	.293
Winner, 1977-2009	Loser, 1977-2009	.4292	.4648	.084

<sup>1</sup>Paired one-tailed *t*-tests under the alternative hypothesis: Average of Group 1 < Average of Group 2.

**Table 3. Difference between BABEs,  
Individual Games in World Series,  
1946-2009**

<i>Group 1</i>	<i>Group 2</i>	<i>Average BABE</i>		<i>p-value on difference<sup>1</sup></i>
		<i>Group 1</i>	<i>Group 2</i>	
Game winner	Game loser	.3538	.4909	<.001
Winner, 1946-1976	Loser, 1946-1976	.3386	.4747	<.001
Winner, 1977-2009	Loser, 1977-2009	.3696	.5078	<.001
Winner, 1946-1976	Winner, 1977-2009	.3386	.3696	.012
AL Winner, 1946-1976	AL Winner, 1977-2009	.3325	.3759	.010
NL Winner, 1946-1976	NL Winner, 1977-2009	.3453	.3614	.381
Loser, 1946-1976	Loser, 1977-2009	.4747	.5078	.009
AL Loser, 1946-1976	AL Loser, 1977-2009	.4710	.5016	.113
NL Loser, 1946-1976	NL Loser, 1977-2009	.4781	.5125	.042
Home Win	Road Win	.4036	.3990	.750
AL Home Win	NL Home Win	.3981	.4099	.570
AL Road Win	NL Road Win	.3973	.4011	.853
Home Loss	Road Loss	.4424	.4434	.945
AL Home Loss	NL Home Loss	.4197	.4605	.051
AL Road Loss	NL Road Loss	.4396	.4467	.705
AL Road Win, 1946-1976	NL Road Win, 1946-1976	.3809	.3881	.801
AL Road Win, 1977-2009	NL Road Win, 1977-2009	.3966	.4270	.323
AL Road Loss, 1946-1976	NL Road Loss, 1946-1976	.4327	.3907	.129
AL Road Loss, 1977-2009	NL Road Loss, 1977-2009	.4469	.4972	.033

<sup>1</sup>For the first three comparisons involving winners (Group 1) and Losers (Group 2), see footnote 1 in Table 2. All other *p*-values are based on a two-tailed *t*-test.

## Reference

1. Allen St. John, "By the Numbers," *The Wall Street Journal*, August 13, 2004, p. W5.



### Footnotes

1. The first mention of BABE appears in [1].
2. As for baseball's other Babe, Ruth's career began in 1914 as a left-handed pitcher for the Boston Red Sox. In six years on the mound at Fenway Park (before that now infamous sale to the New York Yankees), Babe won 89 regular season games and three World Series games (one win in 1916 and two wins in 1918).
3. Between 1946 and 1976, four rule changes were introduced into baseball that would be expected to affect batting and pitching performance statistics. In 1950, the strike zone was narrowed. In 1963, the strike zone was widened. In 1969, the strike zone was again narrowed. In 1973, the American League introduced the Designated Hitter rule but the National League did not.
4. The BABE of the game winner was greater than that of the loser on eight occasions in Game 1, twelve in Game 2, thirteen in Game 3, and fifteen in Game 4. (All four games were contested 63 times between 1946 and 2009.) The BABE of the winner exceeded that of the loser eight times in Game 5 (of 51 times Game 5 was contested) and three times each in Games 6 (40) and 7 (26).
5. BABE was equal to zero only once, in Don Larsen's perfect game (Game 5) in the 1956 World Series. The highest value of BABE was .8837 in Game 5 of the 1991 World Series, when the Atlanta Braves (the ultimate series loser) defeated the Minnesota Twins 14-5.