AN ANALYSIS OF PLAYERS' PERFORMANCES IN THE FIRST CRICKET TWENTY20 WORLD CUP SERIES

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ABSTRACT

The purpose of this paper is to show how batting and bowling performance measures for one-day internationals can be adapted for use in Twenty20 matches, specifically in the case of a very small number of matches played. These measures are then used to give rankings of the batsmen and bowlers who performed best in the first Twenty20 World Cup Series.

Key words: Batting performance; Bowling performance; Ranking of batsmen; Ranking of bowlers.

INTRODUCTION

The Twenty20 form of cricket, where each team gets only twenty overs to bat, has become very popular since its introduction in June 2003. Its rules are similar to those of the one-day form, which uses fifty overs per team, but every match can be very exciting because a batsman cannot afford to leave any ball alone – each team faces only twenty overs. After the conclusion of the first World Cup Series it is interesting to look at the performances of the players and to determine the top performers. Various batting and bowling performance measures have been developed for use in test matches and in one-day internationals (ODIs) alike – cf. Lemmer (2002; 2004 & 2006). These have been extended to take into account the strength of the opponents (Lemmer, 2007; 2008b), or have been modified to be applicable in the case of a small number of matches played (Lemmer, 2005; 2008a). The advent of the Twenty20 form of cricket poses a new challenge. Suitable performance measures have to be found in the light of the fact that no player has a long record of Twenty20 matches. The purpose of this paper is to show what modifications to existing measures are necessary and to use these suitably adjusted measures to analyse the performances of the players in the first Twenty20 World Cup Series.

BATSMEN

The maximum number of matches played by any batsman in the series was only seven. Their scores have been obtained from Cricinfo (2007a). It was decided to consider those batsmen who had batted in at least three innings. A measure that could be used (cf. Basevi & Binoy (2007)) is Calc = $R^2/(out \times B)$, where R is the total number of runs scored, 'out' the number of times the batsman was out and B the number of balls faced. Hence Calc = (R/out) $\times$ (R/B) = AVE $\times$ (SR/100) with AVE = R/out the ordinary average as defined by the cricketing community and SR = $100 \times R/B$ the strike rate. In Lemmer (2008a) it was shown that AVE is not a suitable measure in the case of a batsman who had played a small number of innings and was not out in a large proportion of his innings. Let 'n' denote the total number of scores of a

batsman, 'sumout' the sum of his out scores, 'sumno' the sum of his not out scores, 'avno' the average of his not out scores,

$e_2 = (sumout + 2 \times sumno)/n$

and

$e_6 = (sumout + f_6 \times sumno)/n$ where $f_6 = 2.2 - 0.01 \times avno$.

In Lemmer (2008a) it was reasoned that if a batsman had a not out score, he could have scored more runs, had he had the opportunity to bat until he got out. It was shown that, on average, he could have been expected to double his score. This was the motivation for the formula e_2 where the factor '2' has the effect of doubling each not out score. Many other possible factors have also been considered and the conclusion was that e_6 with factor f_6 was the best overall, with e_2 in second place. It was shown that e_2 and e_6 are generally closely related (cf. Figure 2 and Table 6 in Lemmer, 2008a) and are much more sensible to use than AVE. Subsequent extensive case studies have shown that very large not out scores may cause the difference between e_2 and e_6 to be large (≥ 10). It is therefore recommended that $e_{26} = (e_2 + e_6)/2$ rather than AVE should be the pivotal quantity in the measure to be used. Some of the top scoring batsmen had large (≥ 0.40) not out proportions – cf. Table 1 columns 3 and 4. Note the large difference between AVE and e_{26} in the case of most batsmen who had two or more, not out scores. The measure BP*, defined in Lemmer (2008a) for a short series, now comes into consideration, but for batsmen who had not played international Twenty20 matches before the series the career consistency and career strike rate, which are required in the formula, do not exist. Returning to the construction of the batting performance measure (BP) on p. 59 in Lemmer (2004), guidelines can be obtained on how to find a suitable measure. The exponentially weighted average (EWA) is replaced by e_{26}. Given all the batsmen's short international Twenty20 careers, the consistency measure can again not be incorporated since it is known that the consistency coefficient (CC) varies much in the initial part of a batsman's career. The strike rate, on the other hand, can be used. Firstly, each batsman's strike rate has to be compared with a reference value, and it was mentioned by Varghese (2007) that the average value of SR for all the batsmen in the Twenty20 World Cup Series was 124.03. The value used is not critical because it does not influence the ranking of the batsmen. Let $R = SR/124.03$. In Lemmer (2004) it was argued that for limited overs matches one should define the strike rate adjustment by $RP = R^{0.43}$. This has recently been updated to $RP = R^{0.50}$. Until sufficient data becomes available for international Twenty20 matches, the exponent 0.50 is the most logical one to use. The suggested formula of batting performance in the series, derived from BP, now becomes

$BP_{26} = e_{26} \times RP = e_{26} \times (SR/124.03)^{0.50}$.

By using the exponent 0.50 the effect of SR is scaled down to have a smaller effect than SR in Calc.

In Table 1 the batsmen with averages over fifteen (the rest have been deleted in order to shorten the list) are ranked according to BP_{26}. In order to give ranks also according to Calc for comparison purposes, Sharma, whose average is undefined, because he was not out in all three of his innings, is artificially allocated the rank 1 (otherwise he would fall out of the comparison because he has no average, leaving 45 cases in one ranking and 46 in the other). Obviously one expects the two rankings to be closely related, but there are players whose ranks according to the two measures differ markedly. Schofield scored 24 runs in four innings and was not out in three cases. This gave him AVE = 24, but the more realistic $e_{26} = 12.1$. His

rank according to Calc is 29, compared to a rank of 45 according to BP_{26}. Players with very high strike rates (e.g. Afridi with 197.8, Y. Singh with 194.7 and Arafat with 183.3) benefit too much from these because Calc weights SR too highly. Afridi has AVE = 15.2 but this is blown up to Calc = 30.0 compared to e_{26} = 15.2 and BP_{26} = 19.1. Unrealistically large values of Calc in the case of top performers who had a large proportion of not out scores (cf. Hayden, Kemp, Mubarak and Misbah-ul-Haq) are mainly due to unrealistic averages. This again shows that the traditional average is not a very reliable measure to use in cases where only a small number of innings have been played.

TABLE 1. **RANKING OF BATSMEN ACCORDING TO BATTING PERFORMANCE MEASURE BP_{26}**

BP_{26} rank	Player	Ins	NO	Runs	AVE	SR	e_2	e_6	e_{26}	BP_{26}	Calc	Calc rank
1	M Hayden	6	3	265	88.3	144.8	77.2	62.0	69.6	75.2	127.9	2
2	J Kemp	5	3	173	86.5	139.5	64.0	55.5	59.7	63.4	120.7	3
3	R Sharma	3	3	88	-	144.3	58.7	55.9	57.3	61.8	-	1
4	H Gibbs	3	1	110	55.0	142.9	66.7	45.7	56.2	60.3	78.6	5
5	J Mubarak	4	2	105	52.5	169.4	45.5	41.9	43.7	51.1	88.9	4
6	C McMillan	5	1	163	40.8	181.1	42.2	39.5	40.9	49.4	73.8	7
7	Misbah-ul-Haq	7	3	218	54.5	139.7	45.1	43.4	44.3	47.0	76.2	6
8	A Ahmed	5	1	162	40.5	129.6	44.8	39.6	42.2	43.1	52.5	14
9	M Jayawarden	5	1	159	39.8	152.9	38.8	37.8	38.3	42.5	60.8	8
10	A Morkel	3	0	120	40.0	139.5	40.0	40.0	40.0	42.4	55.8	11
11	K Pietersen	5	0	178	35.6	161.8	35.6	35.6	35.6	40.7	57.6	10
12	B Hodge	3	1	82	41.0	134.4	39.0	37.3	38.1	39.7	55.1	12
13	G Gambhir	6	0	227	37.8	129.7	37.8	37.8	37.8	38.7	49.1	18
14	S Malik	7	2	195	39.0	126.6	39.0	36.9	37.9	38.3	49.4	17
15	Y Singh	5	0	148	29.6	194.7	29.6	29.6	29.6	37.1	57.6	9
16	A Gilchrist	6	1	169	33.8	150.9	33.3	32.8	33.0	36.5	51.0	15
17	S Jayasuriya	5	0	154	30.8	160.4	30.8	30.8	30.8	35.0	49.4	16
18	R Taylor	5	1	118	29.5	138.8	31.0	29.7	30.4	32.1	41.0	19
19	D Maddy	4	0	113	28.3	141.3	28.3	28.3	28.3	30.1	39.9	21
20	A Symonds	4	1	107	35.7	150.7	27.3	27.3	30.1	30.1	53.7	13
21	V Sehwag	5	0	133	26.6	138.5	26.6	26.6	26.6	28.1	36.9	23
22	M Dhoni	6	1	154	30.8	128.3	27.3	27.5	27.4	27.9	39.5	22
23	J Oram	5	1	92	23.0	153.3	25.0	24.1	24.6	27.3	35.3	25
24	I Nazir	7	1	147	24.5	150.0	24.9	24.6	24.7	27.2	36.8	24
25	B McCullum	6	1	139	27.8	121.9	25.8	25.9	25.9	25.7	33.9	26
26	M Boucher	3	0	88	29.3	94.62	29.3	29.3	29.3	25.6	27.8	30
27	Y Arafat	3	1	44	22.0	183.3	18.7	19.0	18.8	22.9	40.3	20
28	M Prior	3	0	69	23.0	111.3	23.0	23.0	23.0	21.8	25.6	33
29	T Dilshan	4	1	65	21.7	122.6	21.5	21.4	21.5	21.4	26.6	31
30	M Ashraful	5	0	87	17.4	181.3	17.4	17.4	17.4	21.0	31.5	27
31	O Shah	5	0	103	20.6	127.2	20.6	20.6	20.6	20.9	26.2	32
32	M Hussey	3	0	65	21.7	108.3	21.7	21.7	21.7	20.2	23.5	34
33	S Afridi	6	0	91	15.2	197.8	15.2	15.2	15.2	19.1	30.0	28
34	K Sangakkara	5	0	104	20.8	105.1	20.8	20.8	20.8	19.1	21.9	38
35	G Smith	5	0	94	18.8	120.5	18.8	18.8	18.8	18.5	22.7	37
36	P Fulton	5	1	77	19.3	105.5	19.6	19.6	19.6	18.1	20.3	41
37	R Uthappa	6	0	113	18.8	113.0	18.8	18.8	18.8	18.0	21.3	39
38	P Collingwood	5	0	86	17.2	132.3	17.2	17.2	17.2	17.8	22.8	36
39	L Vincent	6	0	117	19.5	100.9	19.5	19.5	19.5	17.6	19.7	43
40	Y Khan	7	0	127	18.1	107.6	18.1	18.1	18.1	16.9	19.5	44
41	M Hafeez	6	0	99	16.5	126.9	16.5	16.5	16.5	16.7	20.9	40
42	A Flintoff	5	1	70	17.5	132.1	15.6	15.8	15.7	16.2	23.1	35
43	L Silva	5	1	70	17.5	114.8	15.8	16.0	15.9	15.3	20.1	42

44	R Ponting	4	1	61	20.3	93.8	16.8	17.0	16.9	14.7	19.1	46
45	C Schofield	4	3	24	24.0	120.0	11.8	12.5	12.1	11.9	28.8	29
46	I Pathan	6	4	34	17.0	113.3	6.2	6.3	6.2	5.9	19.3	45

South Africa's batsmen performed well, with Kemp in second position, Gibbs fourth and Albie Morkel tenth.

BOWLERS

A bowler who had played in three matches in the series could have bowled twelve overs. Data has been obtained from Cricinfo (2007a). All the bowlers who had bowled at least twelve overs were considered. Basevi and Binoy (2007) gave a formula that can be used to measure bowling performance. Let B be the number of balls bowled, R the number of runs conceded and W the number of wickets taken, then their formula is Calc = $R^2/(W \times B)$, which can also be written as Calc = $A \times E/6$ where A is the average number of runs scored per wicket taken and E the economy rate. The requirement for the use of Calc is that a bowler should have bowled at least two hundred balls. This requirement is obviously not met. In Lemmer (2005) a method was given which is suitable for the present situation. Calculate CBR* = $3R/(W^* + O + W^* \times R/B)$ where O denotes the number of overs bowled and W* is the sum of the weights of the wickets taken by the bowler. The weight of every wicket depends on the batting position of the batsman whose wicket was taken – cf. Table 2. The list of wickets taken by each bowler has been obtained from the scorecards in Cricinfo (2007b).

TABLE 2. **WEIGHTS OF WICKETS ACCORDING TO BATTING POSITION**

Batting position	Weight	Batting position	Weight	Batting position	Weight
1	1.30	5	1.38	9	0.59
2	1.35	6	1.18	10	0.39
3	1.40	7	0.98	11	0.19
4	1.45	8	0.79	Total	11.00

These weights are those obtained for ODIs. Ideally speaking, weights should be calculated specifically for international Twenty20 matches, but to date no batsman had played a sufficient number (at least twenty) of such matches. It may be reasoned that a batsman's batting ability in Twenty20 matches will be similar to his batting ability in ODIs, so the ODI weights are used until enough Twenty20 data becomes available.

In Table 3 the bowlers who had bowled at least twelve overs are ranked according to CBR*. Their ranks according to Calc are also given for comparative purposes. Note that for most of the top ranked bowlers W* is markedly larger than W. This is due to the fact that they have mainly taken the wickets of top and middle order batsmen, whose weights are larger than one. R Singh with W = 12 and W* = 14.17 took wickets of batsmen numbers 1, 1, 1, 2, 2, 3, 4, 5, 6, 7, 8, 10 and he ranks third (not fifth as in the case of Calc). Gul, on the other hand, took most wickets (13) but is ranked fifth (not second as in the case of Calc) because 46% of the wickets he took were those of lower order batsmen (7, 7, 9, 10, 10, 11).

TABLE 3. **RANKING OF BOWLERS ACCORDING TO BOWLING PERFORMANCE MEASURE CBR***

CBR* rank	Player	O	R	W	W*	CBR*	Calc	Calc rank
1	D Vettori	24	128	11	13.83	7.661	10.34	1
2	S Clark	24	144	12	14.97	8.009	12.00	3
3	R Singh	24	152	12	14.17	8.583	13.37	5
4	M Morkel	20	120	9	10.91	8.608	13.33	4
5	U Gul	27.4	155	13	13.25	8.726	11.13	2
6	M Malinga	14	100	7	8.81	9.010	17.01	7
7	I Pathan	22	149	10	12.46	9.212	16.82	6
8	A Razzak	19	121	7	9.68	9.319	18.35	10
9	C Fernando	17	104	6	8.05	9.381	17.67	9
10	S Afridi	28	188	12	14.63	9.559	17.53	8
11	C Vaas	18	100	5	6.85	9.618	18.52	11
12	M Johnson	24	153	8	10.78	9.928	20.32	13
13	A Flintoff	18	110	5	6.56	10.563	22.41	15
14	S Al Hasan	17	116	6	7.01	10.881	21.99	14
15	C Schofield	12.5	92	4	5.51	11.073	27.49	16
16	N Bracken	22.2	142	8	7.80	11.095	18.81	12
17	M Asif	26.5	212	10	12.29	11.500	27.92	17
18	S Pollock	19.3	167	8	9.79	11.580	29.80	19
19	B Lee	24	171	7	8.90	11.802	29.01	18
20	S Tanvir	23	161	6	8.18	11.861	31.31	21
21	J vd Wath	20	150	6	6.61	12.904	31.25	20
22	J Anderson	15	102	3	3.98	13.026	38.53	28
23	C Martin	15	114	4	4.96	13.032	36.10	27
24	S Bond	24	180	7	7.74	13.039	32.14	22
25	A Mascarenhas	14	122	4	5.50	13.315	44.30	30
26	Harbhajan Singh	23	182	7	7.69	13.372	34.29	25
27	S Jayasuriya	12.5	102	4	4.20	13.543	33.79	23
28	V Philander	13	104	4	4.30	13.546	34.67	26
29	M Gillespie	19.5	156	6	6.36	13.554	34.09	24
30	M Hafeez	19	163	5	6.66	13.899	46.61	31
31	S Sreesanth	23	183	6	7.00	13.976	49.44	29
32	S Rasel	17	123	3	4.00	14.289	54.72	32
33	J Sharma	14.3	138	4	4.80	15.382	59.40	33
34	S Broad	19	184	5	5.72	16.258	82.51	34
35	M Ntini	12	109	2	2.70	17.405	46.61	35

Morné Morkel ranked fourth and was by far South Africa's best bowler. Then follows Pollock, who is ranked 18th. He is normally very economical, but he ranked 30th according to E, 15th according to A and ninth according to his strike rate.

CONCLUSION

Measures specifically adapted to measure performance in the case of a small number of matches have been used to rank the batsmen and bowlers in the first Twenty20 World Cup Series. In both rankings examples have been given of players who would have been ranked differently if ordinary measures had been used. In order to be fair, the most reliable measures should always be used.

The Calc formulas for batting and bowling are simple to calculate, but it was shown here that they are not suitable in the case of a small number of matches. In a recent study of the performances of seventeen South African batsmen in their List-A careers (i.e. one-day matches on local and at international level combined) Mark Boucher was ranked twelfth according to Calc but fourth according to the batting performance measure BPW of Lemmer (2008b). Similarly, among eighteen bowlers Jacques Kallis was ranked thirteenth according to Calc, but third according to the current bowling performance measure CBPW of Lemmer (2008b).

The desire to adjust measures like BPW, CBPW and others for use in Twenty20 cricket and to revisit the weights in Table 2 will not be realized soon because a lot of additional data must become available to do the work properly. Unfortunately the number of international Twenty20 matches is restricted by the International Cricket Council, with the result that players' data grows slowly.

From the results of this study it is interesting to note that India, who won the Twenty20 World Cup, had only one batsman among the top ten batsmen and two bowlers among the top ten bowlers. Pakistan, who came second, also had only one batsman and two bowlers among the top ten. This clearly shows that cricket is a team sport and that the result of a match depends on team effort and not only on individual performances.

REFERENCES

BASEVI, T. & BINOY, G. (2007). The world's best Twenty20 players [http://content-rsa.cricinfo.com/columns/content/story/311962.html]. Retrieved on 3 October 2007.

CRICINFO (2007a). Statsguru [http://stat.cricinfo.com/guru?sdb=find&search=]. Retrieved on 1 October 2007.

CRICINFO (2007b). ICC World Twenty20 [http://content-rsa.cricinfo.com/twenry20wc/engine/current/match/html]. Retrieved on 1 October 2007.

LEMMER, H.H. (2002). The combined bowling rate as a measure of bowling erformance in cricket. *South African Journal for Research in Sport, Physical Education and Recreation,* 24(2): 37-44.

LEMMER, H.H. (2004). A measure for the batting performance of cricket players. *South African Journal for Research in Sport, Physical Education and Recreation,* 26(1): 55-64.

LEMMER, H.H. (2005). A method for the comparison of the bowling performances of bowlers in a match or a series of matches. *South African Journal for Research in Sport, Physical Education and Recreation,* 27(1): 91-103.

LEMMER, H.H. (2006). A measure of the current bowling performance in cricket. *South African Journal for Research in Sport, Physical Education and Recreation,* 28(2): 91-103.

LEMMER, H.H. (2007). The allocation of weights in the calculation of batting and bowling performance measures. *South African Journal for Research in Sport, Physical Education and Recreation,* 29(2): 75-85.

LEMMER, H.H. (2008a). Measures of batting performance in a short series of cricket matches. *South African Statistical Journal,* 42(1): 83-105.

LEMMER, H.H. (2008b). Batting and bowling performance measures for List-A and First Class matches. Submitted for publication in the *South African Journal for Research in Sport, Physical Education and Recreation.*

VARGHESE, M. (2007). Twenty quick numbers [http://content-rsa.cricinfo.com/twenty20wc/content/story/312546.html]. Retrieved on 13 October 2007.

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