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THE ALLOCATION OF WEIGHTS IN THE CALCULATION OF BATTING AND BOWLING PERFORMANCE MEASURES

Hermanus H. LEMMER
Department of Statistics, University of Johannesburg, Auckland Park, Republic of South Africa

ABSTRACT

The performance of a batsman or bowler does not only depend on his own ability, but also on the strength of his opponents. Therefore it makes sense to adjust existing measures to take into account the strengths of the opponents against whom he has played. The batting performance measure BP and the measure of current bowling performance CBP are adjusted by using suitable weights. It is shown that these weights can make a fairly large difference, especially when the player has not played a very large number of matches. Ratings of players are also affected by using weights. Formulae are also given to calculate the present form of a batsman or bowler.

Key words: Cricket; Form of a player; Ranking of bowlers; Ranking of batsmen.

INTRODUCTION

A comprehensive measure of batting performance, BP, has been developed in Lemmer (2004) and one of bowling performance, CBP, in Lemmer (2006). These measures do not take the strengths of the opposing teams into consideration. The purpose of this study is to determine suitable weights of teams and to show how these can be used in the calculation of these and other performance measures. They can also be used to draw up rankings of batsmen and bowlers.

The International Cricket Council has a system to rate players on a scale of 0 to 1000 points. These are used on a regular basis to publish player's ratings and are the official ratings used internationally. A general description of the procedures is given in ICC (2005), mentioning the factors taken into account, but the specific algorithms used for the calculations are not given. Their methods are not available for general use. There is a need for methods that can be used at all levels and therefore it is necessary to improve on methods that are available, like BP and CBP.

In the case of batting, everyone knows that it is easier to score runs against a team with average bowlers than against a team with very good bowlers. If the average of a batsman is calculated, all his scores have equal weight (= 1), despite the fact that some scores were much easier to get than others against stronger teams. In order to be realistic, it is logical to weight scores obtained against a weak bowling team lower than scores obtained against a strong team. The same argument holds in the case of bowling measures. The wicket of a strong batsman should count more than one (e.g. 1.05) and a run conceded against a strong batsman should count less than one (e.g. 0.95). The normal bowling measures can then be calculated after weighting the wickets taken and the runs conceded.

In this paper it is shown how weights are allocated and what differences they make in the calculation of batting and bowling performance measures. In the case of batsmen or bowlers who had played a large number of matches it can be expected that the use of weights will not make much of a difference, because they would have played against strong and weak opponents. The interest lies in the question how large the differences between ordinary and weighted measures would be in a small number of matches.

In order to determine suitable weights to use in calculations, it was necessary to assess the strengths of the teams against which a player has played. For batting measures it was necessary to quantify the bowling strengths of opposing teams, and for bowling measures, the batting strengths of opposing teams. It was also necessary to assess opponents' strength in home and away matches separately. This specialised type of information was not available from the ICC ratings and it was therefore necessary to decide objectively how to find it. For batting strength all the listed (on the Cricinfo Web pages) 'current' batsmen of a country who had batted in at least twenty test innings (they must be experienced enough) and have averages above twenty (they must at least be reasonable batsmen) were included. This gave a large enough database to get reliable estimates of batting performance. In the case of bowling, the requirement was bowlers who had taken at least thirty test wickets and had bowled in at least thirty innings. The case of one-day international matches (ODIs) has been done separately.

WEIGHTS FOR RUNS SCORED IN TEST MATCHES

The weights allocated to runs scored depend on the strength of the opposing team's bowlers. To assess the bowling strengths of teams, the bowling figures of those bowlers who had taken at least thirty wickets in test matches in the list of current bowlers were taken from Cricinfo (2007a) on 30/04/2007. It was required that each bowler should have bowled in at least thirty innings, including at least ten innings in home matches and at least ten innings in away matches. For each innings the number of overs bowled (O), the number of runs conceded (R), the number of wickets taken (W), the opposing team and the country where the match was played have been recorded. The test-playing countries all had between six and twelve bowlers who qualified, except Zimbabwe with four and Bangladesh with five. Their average CBP values (cf. Lemmer, 2006) were very similar and it was decided to pool their figures and consider them as one team instead of two.

It is well known that some bowlers perform very differently depending on whether they play in their home country or away in another country. It was therefore decided that each bowler's measure of current bowling performance, CBP, would be calculated separately for his home and away matches. The bowling strength of each country was obtained by calculating the average CBP (home) and the average CBP (away) values of its bowlers. Note that a weighted average would not be suitable because those bowlers who had played a very large number of innings (e.g. Muralitharan and Vaas in the case of Sri Lanka) would determine their team's values almost entirely. After separating each bowler's bowling figures into 'home' and 'away' matches, it was found that some had bowled in such a small number of matches that their figures could not be relied upon. Those bowlers who had bowled in less than thirty innings were deleted. If a bowler had bowled in less than ten innings away or at home, his scores were also deleted.

The average CBP values and the weights of the nine teams are given, for home and away matches separately, in Table 1. The teams are numbered as follows: Australia (1), England (2), India (3), New Zealand (4), Pakistan (5), South Africa (6), Sri Lanka (7), West Indies (8), and Zimbabwe and Bangladesh combined (9). The CBP values for home matches are indicated by $CBPH_i$, i = 1,2,….,9. These have to be transformed into weights indicated by WH_i, i = 1,2,…,9 that have to be such that

$$WH_1 + WH_2 + \ldots + WH_9 = 9.$$

Let $WH_i = f.CBPH_i$, i = 1,2,…,9. Then from the first equation

$$f.(CBPH_1 + CBPH_2 + \ldots + CBPH_9) = 9,$$

which gives

$$f = 9/(CBPH_1 + CBPH_2 + \ldots + CBPH_9).$$

Then $WH_i = 9.CBPH_i/(CBPH_1 + CBPH_2 + \ldots + CBPH_9)$ for i = 1,2,…,9. The away weights are calculated similarly.

TABLE 1. **WEIGHTS FOR RUNS SCORED TO BE USED IN THE CALCULATION OF BATTING PERFORMANCES IN TESTS**

Bowling team	CBP Home	Weight Home	CBP Away	Weight Away
Australia	7.419	1.119	6.141	0.973
England	6.364	0.960	6.487	1.028
India	6.253	0.943	5.969	0.946
New Zealand	6.654	1.004	6.051	0.959
Pakistan	6.147	0.927	6.371	1.010
South Africa	6.758	1.019	7.094	1.124
Sri Lanka	7.400	1.116	6.425	1.018
West Indies	6.815	1.028	6.321	1.002
Zim-BD	5.862	0.884	5.936	0.941

From the CBP values it is clear that the bowlers of five of the teams perform on average better on home ground than in away matches. For home matches it is not surprising that Australia is the strongest with Sri Lanka second. West Indies' third position seems unrealistic, taking into account that the team did not perform well in recent times. By looking at their batting performances (in Table 3), the explanation seems to be that their batsmen are their weak link. Similarly in Australia's case their bowling in away matches is below average due to the fact that all their bowlers performed worse in away matches than in home matches. The success of the Australians is undoubtedly due to their very strong batting (see Table 3).

The weights are used as follows: A run scored against Australia in Australia has a weight of 1.119 because the Australian bowlers have played on home ground. Anywhere else in the world a run scored against Australia has a weight of 0.973. Instead of the ordinary average, the average of weighted runs should be calculated. Denote a batsman's scores by R_i and the weights by w_i, then the weighted average is

$$WA = \sum_{i=1}^{n} w_i \, Ri \, / \sum_{i=1}^{n} Ind(R_i \text{ out})$$

where $Ind(R_i \text{ out}) = 1$ if R_i is an out score, and $Ind(R_i \text{ out}) = 0$ otherwise. The number of innings played is given by n. In the denominator only the number of out scores should be

counted in order to be in accordance with the customary way of calculating the average. Care should be taken that each score should be multiplied by the correct weight (bowling team playing at home or away). Similarly, in the calculation of BPW (cf. Lemmer, 2004, for the formula of BP), the measure of batting performance using weighted scores, the formulas of EWA and CC should also be adapted to accommodate the weights. In the recording of the scores the code of the opposing team and the country where the match was played should be included.

In order to see to what extent the ordinary and weighted measures of batting performance differ, consider the ratio of the weighted to the ordinary measures for a few batsmen, given in Table 2. The meaning of FR is explained later.

TABLE 2. **RATIOS OF WEIGHTED TO ORDINARY BATTING MEASURES**

Name	J Kallis	H Gibbs	B Dippenaar	I Bell	M Katich	W Tharanga
n	182	144	62	42	38	23
AVE	55.10	43.38	30.14	43.73	36.00	30.68
WA	55.10	43.36	29.82	43.59	34.98	28.84
WA/AVE	1.000	1.000	0.989	0.997	0.972	0.940
BP	56.86	36.65	29.28	39.83	31.95	24.98
BPW	**57.33**	**37.53**	**29.15**	**40.88**	**31.07**	**24.03**
BPW/BP	1.008	1.024	0.996	1.026	0.973	0.962
FR	0.986	0.807	1.012	0.976	0.861	0.890

As expected, the weights have a smaller effect as the number of matches increases. Tharanga's (traditional) average after 23 innings is 30.68 but his weighted average is 28.84 which is 6% smaller. For Dippenaar the difference is only 1.1% after 62 innings. For Kallis there is no difference after 182 innings and BPW is 0.8% larger than BP. The smaller the number of innings played (e.g. in the case of a test series), the more important it is to use weighted measures. BPW is the ultimate measure of batting performance.

WEIGHTS FOR WICKETS TAKEN AND RUNS CONCEDED BY BOWLERS IN TEST MATCHES

Bowling performance depends on the strength of the batsmen of the opposing team, as measured by calculating the batting performance measure, BP, of the recognised batsmen of the team. The scores of those batsmen who had batted in at least twenty test innings and have averages above twenty among the current batsmen of each country were taken from Cricinfo (2007b) on 30/04/2007. Those who had played less than ten innings at home or away have been deleted. The number of batsmen remaining per team varied between seven and eleven, except for Zimbabwe with seven and Bangladesh with six. These have been pooled, as in the case of bowlers.

The average BP value has been calculated for the batsmen of each team. If the batting team is strong, a wicket taken should have a weight higher than one. The wicket weights ww_i are calculated from the average BP values (as in the case of batting weights) and the (weighted)

total number of wickets from $W = \sum_{i=1}^{n} W_i \, ww_i$ where W_i denotes the number of wickets taken in innings number i. Similarly, a run conceded against a strong batting team should have a weight less than one. Therefore the weights of the runs wr_i are calculated from the inverses of the average BP values. Then $R = \sum_{i=1}^{n} R_i \, wr_i$ where R_i denotes the number of runs conceded in innings i. All the ordinary bowling measures can now be calculated, e.g. the average A = R/W, the economy rate E = R/O, the strike rate S = 6*O/W and the dynamic bowling rate DBR = 7*R/(2W + O + 4WR/B) where O denotes the number of overs bowled and B the number of balls bowled. The real measure of bowling performance, CBPW, is also CBP adjusted appropriately to take the weights into account. This calculation requires that the data of each innings played should also contain the opposing team and the country where the match was played. The weights are given in Table 3. Consider South Africa playing against Australia in South Africa. To calculate CBPW for South African bowlers, each Australian wicket taken has a weight of 1.175 and a run conceded has a weight of 0.826 because the Australians are playing away from home. Similarly, a South African wicket taken by an Australian bowler has a weight of 0.856 and a run conceded has a weight of 1.110.

TABLE 3. **WEIGHTS FOR USE IN THE CALCULATION OF BOWLING PERFORMANCES IN TESTS**

Batting team	BP Home	BP Away	Runs Weights Home	Runs Weights Away	Wickets Weights Home	Wickets Weights Away
Australia	54.56	44.32	0.744	0.826	1.279	1.175
England	47.04	40.29	0.862	0.908	1.102	1.068
India	38.25	40.89	1.061	0.895	0.896	1.084
New Zealand	35.75	38.12	1.135	0.960	0.838	1.010
Pakistan	55.58	37.78	0.730	0.969	1.302	1.001
South Africa	36.53	45.18	1.110	0.810	0.856	1.198
Sri Lanka	48.64	34.00	0.834	1.077	1.140	0.901
West Indies	41.52	34.52	0.977	1.060	0.973	0.915
Zim-BD	26.20	24.48	1.548	1.495	0.614	0.649

A comparison between the BP Home and Away values per team shows that the batting performances of India, New Zealand and South Africa are stronger in away matches than at home, but the opposite holds for the other countries. Based on the very good batting strength of Australian batsmen, a bowler who claims an Australian wicket on Australian ground earns a credit of 1.279, whereas a run conceded against them only costs 0.744. The Zimbabwe and Bangladesh batsmen, on the other hand, are so much weaker than the rest that claiming a wicket only counts 0.614 or 0.649, and conceding a run costs the bowler 1.548 or 1.495. The large difference in batting strength between countries causes the weights to differ markedly. It

can therefore be expected that the use of weights will not necessarily diminish as the number of innings increases.

The weights given in Tables 1 and 3 have been determined through an iteration process. Obviously, the formula to calculate the initial CBP values, which gave the first set of weights for runs (the first version of Table 1) did not contain any weights. The weights from the first version of Table 1 were used in the calculation of BP and also the weights for runs and wickets (first version of Table 3). The latter weights were then used to calculate the second set of CBP values and the revised weights for runs. These were used to calculate the second set of BP values, etc. After four iterations all the weights were within 0.001 from their respective values in the third iteration.

By using these weights, all the customary bowling performance measures can be calculated. Let AW and CBPW denote the average and the current bowling performance measures, adjusted for weights. Let AR = AW/A and CBPR = CBPW/CBP be the ratios of the weighted to the un-weighted measures. In Table 4 these measures are used to compare the bowling performances of seven of the current South African bowlers. The meaning of FRD is explained later.

TABLE 4. **BOWLING PERFORMANCE MEASURES OF SOUTH AFRICAN TEST BOWLERS**

Name	n	A	AW	AR	CBP	CBPW	CBPR	FRD
S Pollock	200	23.19(1)	21.86	0.942	7.26	**8.05(1)**	1.109	0.952
M Ntini	141	27.48(2)	26.98	0.982	6.76	**7.34(2)**	1.087	1.109
A Hall	38	35.93(6)	31.70	0.882	6.40	**6.98(3)**	1.090	0.996
J Kallis	175	31.72(5)	31.09	0.980	6.38	**6.86(4)**	1.075	0.953
A Nel	51	31.16(4)	30.04	0.964	5.64	**6.38(5)**	1.133	0.981
N Boje	72	42.65(7)	39.94	0.936	5.39	**5.93(6)**	1.100	0.915
M Hayward	25	28.76(3)	27.45	0.955	5.78	**5.79(7)**	1.002	0.947

The bowlers are ranked according to CBPW with ranks given in brackets. The ranks according to the traditional average are also given. It is not surprising that Hayward, who ranks third according to the traditional A, ranks seventh according to the more comprehensive measure CBPW, because the latter takes into account many more aspects of bowling. Note that even after 200 innings Pollock's weighted and un-weighted averages still differ by about 5.8% and his CBP values by about 10.9%. This indicates that he was quite successful against stronger teams in the sense that, on average, he took more wickets of stronger than of weaker teams. According to CBPW Pollock was the best South African test bowler with Ntini second and Hall third.

THE PRESENT FORM OF A BATSMAN OR BOWLER

The exponentially weighted average, EWA, of a batsman reflects his present performance better than his average because recent scores have higher weights than scores further back in his career – cf. Lemmer (2004: 59). The ratio EWA/AVE can thus be used to measure the present (or most recent) form of the batsman. This reasoning also holds in the case of weighted scores. Define the form ratio as FR = EWAW/AW where EWAW is EWA using the

weighted scores. A batsman who is in good form will have FR >1 and one in bad form FR <1. From Table 2 FR = 0.986 for Kallis and FR = 1.012 for Dippenaar. Both were in good form at the end of the last test series they played in. For Gibbs FR = 0.807 which shows that he was in bad form. This is clear by looking at his final scores of 18, 0, 9, 17, 16, 53, 6, 2, 19, 18, 0, 92, 2 and 40. Only two are above his average of 43.38.

In the case of bowling, it was mentioned in Lemmer (2006: 102) that the present form can be judged by comparing the career dynamic bowling rate, DBR, with the exponentially weighted bowling rate WDBR in unlimited-overs matches. This also holds in the case of the measures based on weighted runs and wickets introduced in this paper, indicated by DBRW and WDBRW. Define the form ratio by FRD = DBRW/WDBRW, then a value >1 indicates good form. From Table 4 it can be seen that Ntini, who was the second best bowler, was in good form with FRD = 1.109, but Pollock was in bad form with FRD = 0.952.

THE DETERMINATION OF WEIGHTS IN THE CASE OF ODIs

The bowling figures of those bowlers who had taken thirty or more wickets in ODIs in the list of current bowlers were taken from Cricinfo (2007c) on 30/04/2007. It was again required that each bowler should have bowled in at least thirty innings, and in at least ten innings both in home and away matches. The test-playing countries all had between six and twelve bowlers who qualified, except Zimbabwe with four and Bangladesh with five. It was again decided to pool the latter two.

Besides the ten countries involved in test cricket there are many more that had played in ODIs, but almost all of these teams had played very few ODIs. The result is that among all those batsmen, Kenya is the only country that has batsmen who had played in more than twenty ODIs and have averages above twenty, namely six. On the bowling side, only four bowlers (both from Kenya) had taken more than thirty wickets. It was, therefore, not feasible to calculate statistics for these teams and it was decided that the Zim-BD weights would be used for these countries also. Matches against these countries are so rare that this decision would not have a great effect.

TABLE 5. **WEIGHTS FOR RUNS SCORED TO BE USED IN THE CALCULATION OF BATTING PERFORMANCES IN ODIs**

Bowling team	CBP Home	Weight Home	CBP Away	Weight Away
Australia	9.431	0.968	9.371	1.032
England	10.600	1.088	9.212	1.014
India	9.298	0.954	8.368	0.921
New Zealand	11.138	1.143	9.483	1.044
Pakistan	8.795	0.903	9.119	1.004
South Africa	10.309	1.058	9.230	1.016
Sri Lanka	10.576	1.085	9.019	0.993
West Indies	9.159	0.940	9.677	1.065
Zim-BD	8.395	0.862	8.269	0.910

New Zealand's data base contains a large group of mainly experienced bowlers, as is the case with the Sri Lankan bowlers. England's small data base consists of experienced bowlers

because their younger bowlers do not yet qualify for inclusion. The Australian bowlers are not all very experienced and Warne was no longer part of their current group of bowlers.

The weights given in Table 5 (and also down in Table 7) have also been obtained after an iteration process, as in the case of test matches. To see how the weights affect the measures, a few batsmen's results are given in Table 6.

TABLE 6. **RATIOS OF WEIGHTED TO ORDINARY BATTING MEASURES**

Name	B Lara	W Tharanga	S Nafees	A Prince	A B de Villiers	I Farhat	M Vermeulen	M Rana
n	289	51	47	41	40	33	32	21
AVE	40.49	33.61	35.49	35.10	34.86	30.44	20.82	20.69
WA	40.22	33.90	33.01	34.67	34.24	31.66	20.75	20.15
WA/AVE	0.993	1.009	0.930	0.988	0.982	1.040	0.997	0.974
BP	34.96	32.14	29.83	32.69	43.75	29.31	15.04	17.08
BPW	**34.02**	**32.47**	**27.46**	**31.96**	**42.85**	**30.13**	**14.99**	**16.93**
BPW/BP	0.973	1.010	0.921	0.978	0.979	1.028	0.997	0.991
FR	0.802	0.944	0.908	0.833	1.145	0.923	0.809	0.927

As the number of matches increases, the effect of weights declines, but in contrast to Vermeulen, whose measures are almost equal after only 32 matches, Nafees' ordinary and weighted average differ by about 7% after 47 matches. De Villiers with FR = 1.145, was in good form, but Prince, with FR = 0.833, was in bad form. Lara, with FR = 0.802, concluded his ODI career on a low note.

In the case of bowling measures it was necessary to study the batting strength of each of the countries. The scores of those batsmen who had batted in at least twenty ODIs and have averages above twenty among the current ODI batsmen of each country were taken from Cricinfo (2007d) on 30/04/2007. Those who had played in less than ten innings at home or away were deleted. The number of batsmen remaining per team varied between seven and eleven, with Zimbabwe having eleven and Bangladesh eight. This time it was feasible to obtain weights for the latter two countries separately. The Bangladesh weights can be used for the other countries like Kenya.

In the case of ODIs the bolwing performance measure CBP is based on the combined bowling rate rate CBR = 3*R/(W + O + WR/B) and details of it's calculation can be found in Lemmer (2006).

TABLE 7. **WEIGHTS FOR USE IN THE CALCULATION OF BOWLING PERFORMANCES IN ODIs**

Batting team	BP Home	BP Away	Runs Weights Home	Runs Weights Away	Wickets Weights Home	Wickets Weights Away
Australia	43.96	48.87	0.785	0.602	1.237	1.557
England	35.04	34.63	0.985	0.850	0.986	1.103
India	43.04	31.74	0.802	0.927	1.211	1.011
New Zealand	31.88	28.69	1.083	1.026	0.897	0.914
Pakistan	39.84	28.71	0.866	1.025	1.121	0.914
South Africa	39.70	32.28	0.869	0.912	1.117	1.028
Sri Lanka	36.75	36.20	0.939	0.813	1.034	1.153
West Indies	32.03	32.83	1.078	0.896	0.901	1.046
Zimbabwe	26.40	20.89	1.307	1.409	0.743	0.666
Bangladesh	26.85	19.11	1.286	1.540	0.755	0.609

In these weights the exceptional batting strength of Australia comes out even stronger than in tests, resulting in wicket weights of 1.237 (home) and 1.557 (away). This can be understood if one takes into account that in ODIs bowlers are much more restricted than in tests. These weights are now used to rank some of the current South African bowlers, based on their ODI figures until the end of the 2007 World Cup Series – see Table 8, where ranks are given in brackets for some of the measures. As before, let AR = AW/A and CBPR = CBPW/CBP.

TABLE 8. **BOWLING PERFORMANCE MEASURES OF SOUTH AFRICAN ODI BOWLERS**

Name	n	A	AW	AR	CBP	CBPW	CBPR	FRC
Pollock	281	24.02(2)	21.92(2)	0.912	12.84	**13.32(1)**	1.037	1.068
Hall	75	25.74(3)	23.99(4)	0.932	9.84	**10.42(2)**	1.059	1.022
Telemachus	37	27.95(5)	20.31(1)	0.727	8.46	**10.40(3)**	1.230	0.988
Nel	60	27.61(4)	27.47(5)	0.995	9.62	**9.98(4)**	1.037	1.028
Ntini	149	23.60(1)	22.62(3)	0.958	9.46	**9.53(5)**	1.007	0.908
Kallis	227	31.52(8)	29.10(6)	0.923	8.92	**9.10(6)**	1.021	0.962
Boje	108	35.57(9)	31.73(7)	0.892	8.81	**8.37(7)**	0.950	0.875
Kemp	45	30.44(7)	38.01(9)	1.249	9.02	**8.36(8)**	0.927	0.978
Langeveldt	45	29.23(6)	34.55(8)	1.182	8.34	**8.17(9)**	0.979	0.987

By looking at the top five bowlers, it is clear that their rankings according to the ordinary average, A, the weighted average, AW, and the newly constructed measure CBPW, all differ. This is not surprising, because neither the traditional A nor AW is a comprehensive measure, as is the case with CBPW. According to CBPW Pollock was by far the best South African ODI bowler, with Hall second and Telemachus third. It is ironic that Telemachus did not get a single match during the World Cup Series despite his good ODI record. Among his 56 wickets, the vast majority were against the strongest batting teams: 18 were against Australia, 17 against Sri Lanka and 7 against Pakistan. His traditional average is 27.95, but the more

sensible weighted average is 20.31 (the best of all the bowlers). This is a good example to show why the use of weights is very important. These weights are also used in CBPW.

The most recent form of a bowler is now defined as FRC = CBRW/WCBRW, similar to FRD for tests. From Table 8 it can be seen that Pollock was in very good form and Hall, Nel and Telemachus in good form.

CONCLUSION

The wickets of the different batsmen of a team (e.g. R. Ponting and G. McGrath) have the same weight. This is not too serious a problem, because the interest lies in the total weight of the wickets taken by a bowler. It is unfeasible to determine weights separately for each batsman of all teams. In the case, though, of a small number of innings played, the weights of this study can be combined (multiplied by) the weights allocated to batsmen according to their batting positions, as described in Lemmer (2005).

The weights obtained in this study obviously depend on the players used in the databases. An attempt was made to get as large a database as possible for each situation by using all the so-called current players who had played the required number of matches, as specified before. Some of the players are presently not in the selected squad of their country, but their career performances help to reflect the strength of their country's team over a reasonable period. Obviously the weights should be updated from time to time by using the procedure described in this paper.

The procedure described here can also be used to determine weights for domestic cricket, e.g. for limited-overs matches (separately for One-Day and Twenty20 matches) and for unlimited-overs (three- or four-day) matches. For each type the challenge will be to define a suitable data set to use. The case of weights for First-Class and List A matches is a challenging one, because these include matches played on domestic and international level alike. Obviously the weights obtained in the present study are not suitable for these types of mixtures.

It is clear that the use of weights makes a difference in the calculation of batting and bowling performance measures and it is important that the weighted measures BPW and CBPW should be used when the performances of players are compared. These comprehensive measures take the most important aspects of good batting and bowling into account and are undoubtedly much more reliable than the traditional measures, which are used by selectors by looking at each in isolation.

The form ratios are also useful measures because they give an indication of the present form of a batsman or bowler irrespective of his performance level.

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Prof. Hermanus H. Lemmer: 122 Fourth Avenue, Fairland 2195, Republic of South Africa. Tel. (w) +27 (0)11 6784413, Tel. (h) & fax +27 (0)11 6783031, Cell: 073 1661934, E-mail: hoffiel@uj.ac.za

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