Duckworth/Lewis Method of Re-calculating the Target Score in an Interrupted Match

Introduction

The D/L method sets revised targets in interrupted limited-overs matches in accordance with the relative run scoring resources which are at the disposal of the two sides.

These are not in direct proportion to the number of overs available to be faced, as with the average run rate method of correction. Instead they depend on how many overs are to go and how many wickets are down when the interruptions occur.

To calculate the revised targets, you need to know the resources available at the stage of the match when suspensions and resumptions of play occur. All possible values of resources have been pre-calculated and these are listed in the accompanying table.

The table covers each individual ball in a game of up to 50 overs per side. The figures given in the table are percentages of the resources available for a complete 50 over innings.

For matches reduced to less than 50 overs per innings before they start, the resource percentages available at the start of an innings will be less than 100%. But the same table and the same method of calculation are used whatever the number of overs per innings.

A single sheet over-by-over version of the table appears at the end and this alone can be used for cases when play is suspended before the start of a new over.

When Team 2 (the side batting second) have less run scoring resources at their disposal than had Team 1 (the side batting first), their target is adjusted downwards using the ratio of the resources available to the two sides.

But when Team 1's innings has been interrupted, it often happens that Team 2 have more resources at their disposal than had Team 1 and it is now necessary to adjust Team 2's target upwards. In this case the adjustment is based on the runs that would be expected to be scored on average from the extra resources at their disposal. The number of these extra runs required is calculated by applying the excess resource percentage to the average total score in a 50 over innings. The value to be used for this average score is 235.

2 Definitions

The team batting first are referred to as 'Team 1' and the team batting second are referred to as 'Team 2'. In the table decimal fractions of an over are expressed in standard cricket notation; eg, 4.3 overs means 4 overs plus 3 balls.

The terms 'target' and 'revised target' are reserved exclusively for the minimum score Team 2 need to win. As with an uninterrupted match, if Team 2 make a score which is one run short of the target, the match is tied.

The following symbols are used throughout:

- **N** is the number of overs per innings for the match as decided at the moment of delivery of the first ball of the match

- **N1** is the number of overs Team 1 have had the opportunity of facing during their innings (which may not be a whole number)

- **S** is Team 1's total score

- **R1** is the resource percentage (relative to a full 50 over innings) available to Team 1

- **R2** is the resource percentage (relative to a full 50 over innings) available to Team 2

- **RP** is the resource percentage (relative to a full 50

over innings) lost by Team 2 as a penalty for slow bowling

T is Team 2's target score.

3 Calculation of the Percentage Resource Lost by a Suspension in Play

To compensate for any loss of overs due to a suspension in play during either Team 1's or Team 2's innings, it is necessary first to calculate the resource percentage that has been lost on account of this suspension.

If the suspension occurs between overs, use the final sheet of the table which gives the figures for whole numbers of overs. If it occurs mid-over, use the earlier pages which provide the figures for each individual ball.

3.1 For the start of the suspension in play, from the table note the resource percentage that remained for the appropriate number of overs/balls left and wickets lost.

3.2 For the resumption of play after the suspension, from the table note the resource percentage now remaining for the revised number of overs/balls left and for the same number of wickets lost.

3.3 Subtract the resource percentage in 3.2 from that in 3.1 to give the resource percentage lost.

3.4 If a suspension in play causes the innings to be terminated, the resource percentage on resumption (3.2) is zero and the percentage lost is the resource percentage which was remaining when the suspension occurred (3.1).

3.5 If more than one suspension in play occurs, the resource percentages lost are calculated as described in 3.1 - 3.4 and are accumulated to give updated values for the total resource percentage lost or resource available for the innings. This is done after each suspension as described in 5.2 and 5.5.

4 Allowing for penalties for slow over rates

(Not applicable in C&G Trophy, Twenty20 Cup and National Cricket League) or the semi-finals and final of the Second XI Trophy

If Team 1's innings takes longer than the time allocated and the umpires decide that Team 2's slow over rate has been responsible, at least in part, then they may penalise Team 2 by reducing their allocation of overs from which to make their required target. If overs are additionally lost due to a suspension in play, this penalty has to be allowed for in the calculation of revised targets.

The way this is done is by attributing Team 1's score to a lower resource percentage than was actually used. Thus Team 1's resource percentage R1 is reduced by the loss of run scoring resources, RP, suffered by Team 2 as a result of the penalty, and this reduced value of R1 is the value that is used in the calculation of revised targets as described in 5 below. RP is calculated by the following procedure.

4.1 Note the number of overs/balls which Team 1 faced, or had the opportunity of facing, during their innings, N1, and the number of overs penalty, P.

4.2 From the table, note the resource percentage for N1 overs remaining and 0 wicket lost.

4.3 From the table, note the resource percentage for N1 - P overs remaining and 0 wicket lost.

4.4 Subtract the resource percentage in 4.3 from that in 4.2 to give the resource penalty, RP.

5 Calculation of revised targets

5.1 Note the number of overs per innings decided at the start of the game, N. From the table note the resource percentage available to Team 1 at the start of their innings. (For N = 50 this is 100%.)

5.2   For all suspensions and any premature termination of Team 1's innings, calculate the total resource percentage lost using the procedure described in 3. Subtract this from the starting resource percentage (5.1) to give R1, the resource which was available to Team 1 for their innings. Note Team 1's total score, S.

5.3   If Team 2 have been penalised for a slow over rate, calculate the loss of resource, RP, equivalent to the overs penalty as described in 4 and subtract this from the value of R1 calculated in 5.2 to give an updated value of R1. This replaces the value from 5.2.

5.4   Note the number of overs allocated to Team 2 at the start of their innings and from the table note the resource percentage for this number of overs remaining and 0 wicket lost. This is R2, the resource percentage available to Team 2. If R2 differs from R1, which will happen if Team 1's innings was interrupted and/or Team 2's was delayed, a revised target must be set. Calculate this revised target, T, as described in 5.6 below.

5.5   For each suspension of play during Team 2's innings or for premature termination of the match, update the resource percentage available, R2, by subtracting the resource percentage lost calculated as in 3. Calculate the revised target, T, after each suspension as described in 5.6 below. If the match has to be terminated, the result is decided by comparing Team 2's score at the time with the 'par score', this being the revised target, calculated as in 5.6 below, less one run. If it is greater, Team 2 win. If it is equal, the match is tied. If it is less, Team 1 win.

5.6   If R2 is less than R1, Team 2's revised target is obtained by reducing Team 1's score S in the ratio of R2 to R1, ignoring any figures after the decimal point, and adding one run,

i.e. $T = (S \times R2/R1) + 1$ (rounded down to a whole number, if necessary).

If R2 is equal to R1, no revision is needed and Team 2's target is one more run than Team 1's score, i.e. $T = S+1$.

If R2 is greater than R1, calculate the amount of excess, R2 - R1, and take this percentage of the average 50 over total, which is 235, to give the extra runs needed, ignoring any figures after the decimal point, i.e. $T = (S + 235 \times (R2 - R1)/100) + 1$ (rounded down to a whole number, if necessary).

6 Penalty runs

6.1 During Team 1's Innings:

If penalty runs are awarded to the batting side, then their score shall advance accordingly and be taken into account when performing any future D/L calculation.

If penalty runs are awarded to the Fielding side, then the D/L calculation in between innings will be performed as normal and their innings will commence with the score equivalent to the number of penalty runs that they have been awarded.

6.2 During Team 2's Innings:

If penalty runs are awarded to the batting side, then their score will advance accordingly. These penalty runs do not affect any subsequent D/L calculation.

If penalty runs are awarded to the fielding side then there will be no recalculation of any D/L target. Instead, the target score and the entire schedule of par scores will advance by the appropriate number of penalty runs. If a loss of overs occurs after such a penalty has been awarded, then the D/L target will be calculated based upon the original score of the side batting first, and this target, and all par scores, will then be raised by the appropriate number of penalty runs.

7   The Result and its Description

When a revised target has been calculated and the match has been played out to its completion, the result is described exactly as in the case of an uninterrupted match; if Team 2 achieve their revised target they win by the number of wickets they have in hand when they reach this score; if they fall short of their revised target by exactly one run the result is a tie, and if they are all out for a lower score Team 1 win by the margin of runs by which Team 2 fall short of the score needed to achieve a tie.

When a match has to be abandoned with Team 2's innings in progress (provided sufficient overs have been bowled to constitute a viable match), the result is decided by comparing Team 2's score with the 'par score' as defined in 5.5 and the winning margin is described in terms of the number of runs by which their score differs from the 'par score', regardless of whether Team 1 or Team 2 are the victors. The description is then qualified by appending '(D/L method)'.

Examples of result description:

(i)   Team 2 are set a revised target of 186. But they only succeed in making 180 in their allocation of overs.They thus fall 5 runs short of the 185 runs needed to tie the match and the result is described as 'Team 1 win by 5 runs (D/L Method)'.

(ii) Team 2 are chasing a target of 201 in a 50 overs-per-innings match and reach 115/4 after 30 overs when rain causes the match to be abandoned. At this point the 'par score' is 110. Team 2 have exceeded this by 5 runs and so the result is described as 'Team 2 win by 5 runs (D/L method)'.