

Speed Rating Calculation

Weight Carried Adjustments

I have eventually decided to attempt to calculate estimated speed ratings as though all horses carried the same weight (126 Lbs). I apply the following rules when extracting race times for all horses (stored as AdjRaceTime). These adjusted race times are used to derive Par values and used to calculate individual Speed Rating figures. The Spr is then re-adjusted for future races depending on future race weight to be carried. I am not totally convinced that this approach is correct, as I cannot prove the LbsPerLen figures, but results seem to be better than not adjusting for weight carried.

| _Course | _Dist | _LbsPerLen | _HorseLen | _LbsPerMeter | _MetersPerSec | _SecsPerMeter | _LbsPerSec | _SecsPerLb |
|---------|-------|------------|-----------|--------------|---------------|---------------|------------|------------|
| HAPP | 1000 | 3.00 | 2.7 | 1.11 | 17.340 | 0.058 | 19.266 | 0.052 |
| HAPP | 1200 | 2.67 | 2.7 | 0.99 | 16.967 | 0.059 | 16.778 | 0.060 |
| HAPP | 1650 | 2.00 | 2.7 | 0.74 | 16.315 | 0.061 | 12.085 | 0.083 |
| HAPP | 1800 | 1.75 | 2.7 | 0.65 | 16.247 | 0.062 | 10.531 | 0.095 |
| SHA_ | 1000 | 3.00 | 2.7 | 1.11 | 17.471 | 0.057 | 19.412 | 0.052 |
| SHA_ | 1200 | 2.67 | 2.7 | 0.99 | 17.092 | 0.059 | 16.902 | 0.059 |
| SHA_ | 1400 | 2.33 | 2.7 | 0.86 | 16.855 | 0.059 | 14.545 | 0.069 |
| SHA_ | 1600 | 2.00 | 2.7 | 0.74 | 16.716 | 0.060 | 12.382 | 0.081 |
| SHA_ | 1800 | 1.75 | 2.7 | 0.65 | 16.518 | 0.061 | 10.706 | 0.093 |
| SHA_ | 2000 | 1.50 | 2.7 | 0.56 | 16.165 | 0.062 | 8.981 | 0.111 |

- **LbsPerLen** is the normal handicapping adjustment to weight carried depending of number of lengths beaten
- **HorseLen** standard in meters. Figures of 8 foot or 9 foot for a racing length are used by different racing jurisdictions, so I have settled for 2.7 meters.
- **LbsPerMeter** is LbsPerLen divided by 2.7
- **MetersPerSec** is the average race speed for ever horse that ran on turf in Hong Kong on good ground during the 19/20, 20/21 and 21/22 seasons.
- **SecsPerMeter** is the inverse on MetersPerSec giving the fraction of a second that is the time taken to cover one meter
- **LbsPerSec** is the weight required to enable the horse to run one second faster (or slower). This is calculated by dividing LbsPerMeter by SecsPerMeter
- **SecsPerLb** is the inverse of LbsPerSec giving the perceived time difference when adjusting weight carried by one pound.

The SecsPerLb value is then used to adjust the race time for each runner to give an estimated race time that would have been achieved if the horse carried 126 Lbs. As such if he carried more than 126 Lbs the race time would be decreased and vice versa if he carried less than 126 Lbs.

The SecsPerLb value is also used to adjust the Speed Rating figure used in future races, depending on the weight to be carried.

Race Result Speed Rating

Speed ratings are basically the difference between the par time and a horse's race time. This difference is then multiplied by a factor that turns the time difference into a number of points or rating. I have experimented with a number of different factors and the following formula seems to give the best results for Hong Kong races.

$$80 + ((ParTime - RaceTime) * 10)$$

The ParTime is the average race time (AdjRaceTime as above) for all runners in each race over each Course and Distance run on Good going, as described in the Standard Race Times (Pars) topic.

The RaceTime is total race time (AdjRaceTime as above) for the horse, this will also be adjusted by a going allowance if the race was run on Good/Soft or Good/Firm ground. If so I need to convert the time to speed (Meters per second) then if the race is run on good/soft ground, I would increase the speed figure, though if a race is run on good/firm ground, I would decrease the speed figure. I then convert the speed back to time (seconds) so that I can compare with the ParTime.

The following going allowances are used

| Course/Dist/Going | MPS Adj |
|-------------------|---------|
| AdjHAPPGF | -0.12 |
| AdjHAPPGS | 0.21 |
| AdjSHA_GF | -0.12 |
| AdjSHA_GS | 0.24 |
| AdjSHA_1000GF | -0.22 |
| AdjSHA_1000GS | 0.15 |

The constant 10 just causes one point to be generated for a 0.1 second difference.

Note that the Spr for equivalent horses should be similar, irrespective of the racecourse and race distance. However the Spr should improve when the class of race improves.

Pace Speed Rating

Speed Ratings are also maintained for the Pace of each race, calculated in the same way as race speed ratings. The pace time of the race is defined as the time taken by the leading horse to travel from the start of the race to the 400 meter pole. No adjustment for weight carried is performed for Pace time. The primary use of this rating is to determine the pace of the race, being one of the following.

- **Slow** - pace spr less than or equal to 74
- **Good** - pace spr greater than 74 and less than or equal to 86
- **Fast** - pace spr greater than 86

Speed Ratings By Class

| Grade | 1920 | 2021 | 2122 | Average |
|-------|------|------|------|---------|
| G1 | 101 | 99 | 95 | 99 |
| G2 | 97 | 96 | 95 | 96 |
| G3 | 98 | 93 | 89 | 93 |
| C1 | 93 | 93 | 86 | 91 |
| C2 | 92 | 92 | 90 | 91 |
| C3 | 89 | 90 | 88 | 89 |
| C4 | 87 | 87 | 85 | 86 |
| C5 | 81 | 83 | 83 | 82 |

The above tables shows average speed ratings for all Hong Kong turf races for the last three seasons.

These tables give a insight into the different Sprs achieved by horses running in the different race classes.

Future Race Speed Ratings

The speed ratings that I allocate each runner in a future race is derived from the Speed Ratings assigned to his last three runs. This is done by totalling 50% of the most recent Spr plus 30% of the Spr before that plus 20% of the Spr before that.

These speed ratings are then adjusted by weight that is due to be carried, as follows

- Extract the SecsPerLb figure from the Weight Carried Adjustments table (above) for the course and distance of the future race.
- Multiply the SecsPerLb figure by 10 (as the Spr Par minus racetime figure is multiplied by 10)
- Calculate the number of Lbs due to be carried that is greater or less than 126 and multiply by the SecsPerLb (times 10) figure above
- If the future WeightCarried figure is greater than 126 then reduce the Speed Rating by this amount, otherwise increase the Speed Rating by this amount.