An explanation of Cross IMP Scoring

We are all very familiar with Butler IMP scoring - first calculate the **average** of all scores obtained by the NS pairs, then IMP your table score against this Butler average. See Calculation 1 below.

Calculation 1: The Butler average is (3 x 680 – 100)/4 = 485, which is rounded to 490.

NS	EW	Cont	Dec	NS Score	Score calculation	Nett IMPs
7	5	4S	N	680	680 - 490 = +190	+5
6	8	3NT	S	-100	-100 - 490 = –590	-11
4	1	4S	N	680	680 - 490 = +190	+5
2	3	4S	S	680	680 - 490 = +190	+5
					Total	+4

In contrast, Cross IMP scoring does these two mathematical operations in the other order - first calculate an IMP score against each of the other tables, then calculate the average. This process is shown below in Calculation 2. Remember, each pair scores up with their teammates, the pairs sitting in the opposite direction at each of the other three tables - these scores and their associated IMPs are shown in the shaded columns.

Calculation 2

NS	EW	Cont	Dec	NS Score	NS Scores *v* other tables	NS IMPs *v* other tables	NS Cross IMPs
7	5	4S	N	680	+780, 0, 0	13, 0, 0	13 ÷ 4 = 3.25
6	8	3NT	S	-100	-780, -780, -780	-13, -13, -13	–39 ÷ 4 = –9.75
4	1	4S	N	680	0, +780, 0	0, 13, 0	13 ÷ 4 = 3.25
2	3	4S	S	680	0, +780, 0	0, 13, 0	13 ÷ 4 = 3.25
						Total	0

Why, in the Cross IMP calculation, did we divide the number of IMPs won by the number of tables (4) rather than by the number of comparisons (3)? Consider Pair 6, who bid the wrong game, and hence should lose 13 IMPs with a nett score of -780 against every other table. That's exactly what they scored **relative to the other NS pairs**: –9.75–3.25 = –13. If you divide by 3 instead, you get scores of 4.33 and –13, so they lose 17.33 IMPs for going down in a vul game that everyone else made.

There's little difference between the methods when all scores are reasonably closely bunched as the following example shows.

Example 1. The Butler average is (+120+90+50-100)/4 = +40.

NS	EW	Cont	Dec	NS Score	NS Butler IMPs	NS Cross IMPs
1	4	1NT	N	+120	2	(1+2+6)/4 = 2.25
7	5	1NT	S	+90	2	(-1+1+5)/4 = 1.25
2	3	2H	W	+50	0	(-2-1+4)/4 = 0.25
8	6	2S	S	–100	–4	(-6-5-4)/4 = –3.75
				Total	0	0

When there is a large spread of scores on a board, both methods distort the IMPs won and lost. In the example below, Pair 4 would expect to pick up 17 IMPs relative to Pair 7 if playing a head-to-head teams match. Instead, they pick up 26 IMPs using Butler and 20.25 using cross IMPs. Similarly, in a head-to-head teams match, Pair 2 would expect to pick up 9 IMPs against Pair 5 (+420 difference). Instead they pick up 11 (3 - -8) using Butler, but only 6.25 using Cross IMPs.

Example 2. The Butler average is (+1400+620+200-100)/4 =+530 (after rounding)

NS	EW	Cont	Dec	NS Score	NS Butler IMPs	NS X IMPs
4	8	1NTX	W	+1400	+14	(13+15+17)/4 = +11.25
2	6	4S	N	+620	+3	(-13+9+12)/4 = +2.00
5	3	3S	N	+200	–8	(-15-9+7)/4 = –4.25
7	1	5S	N	–100	–12	(-17-12-7)/4 = –9.00
				Total	+3	0

Each method has its pros and cons. These are some of them:

Pros for Butler

- We're very familiar with how it works.
- Given a single Butler average score for each board, we can calculate a score for ourselves and check it against the score posted by the Director.

Pros for Cross IMPs

- The total of IMPs won by NS is always 0 on each board, so the average score for the session is 0 for both the NS and EW fields.
- When there are only 2 scores, eg +620 and +1370, the IMPs won and lost never get distorted - you always win exactly 13 IMPs for bidding a vulnerable slam relative to a pair who only bid game. (The +9 and –10 IMPs scored using Butler results in a 19 IMP relative swing.)
- Overtricks are always reflected in the scores; the Butler averaging process can mean scores of +90 and +120 win (or lose) the same number of IMPs. See Example 1.

Cons for Butler

- The average Butler score we IMP against is quite often not a proper bridge score.
- The total IMPs won by NS on a board is rarely 0. Hence the average NS score for the session may be a large plus or minus.
- With larger fields, it is common practice to calculate the Butler average from the middle 80% of scores. This may be sensible if there's an aberrant -1700 penalty in the mix, but can skew the Butler average in other situations.
- When there is a large spread of scores on a board, the IMPs won and lost get amplified more using Butler than using cross IMPs. See examples above.

Cons for Cross IMPs

- It's very hard for the players to check their scores - they are basically reliant on the Director / computer programmer not making any errors.
- Players win or lose fractions of IMPs on each board, so the IMPs awarded can seem almost random.
- Players mentally rate their scores against 0, so don't readily appreciate that a small positive score may be very good if many other pairs in their direction go negative.