

COMPUTER AND HUMAN TIPPING OF AFL FOOTBALL - A COMPARISON OF 1991 RESULTS

5.0. Abstract

For over a decade the author has been involved in computer tipping of VFL and now AFL football. Evidence suggests that the computer, although ignoring much information available to human tipsters, is at least as accurate. This paper explores the difficulty of predicting, analyses the accuracy of the computer in 1991, compares the relative accuracy of human and computer tipping in 1991, and investigates some reasons for limiting human performance.

5.1. Introduction

In 1981 The Sun News Pictorial began publishing the results of a computer tipping program written by the author. This continued until 1986, when The Sun decided to concentrate on human tipsters. Some details of this period are contained in . In 1991 The Age published the now updated computer program tips for winners and margins along with the predictions of winners by several experts. The Sun meanwhile published both the predicted winners and margins for 12 experts and 12 celebrities. This allows an opportunity to compare the accuracy of the computer with those of so called experts, and the general public.

Details of computer methods for tipping football are contained in . The program discussed here uses an exponential smoothing algorithm, to produce team ratings and team/ground interaction factors for each team. Of relevance to the present paper is that the algorithm uses only the names of the teams playing, the ground the match is played on, and the previous final results of the matches. It ignores all other data, many of which the average and expert follower believe is important. The computer knows nothing of such things as team personnel (absence of key players), weather, time of day (e.g. night matches), previous

team played (e.g. bye), time since last match, etc. One would therefore expect the humans to out-perform the computer.

5.2. Distribution of margins

Before looking at how the computer has performed, it is worth looking at how difficult the task has become. Figure 5.1 shows the home ground margins for home and away matches in 1991. The distribution of scores is reasonably symmetric. The mean home ground advantage for the (nominal) home teams is 8.3 points. Note the large spread of scores - standard deviation of over 50 points. show that prediction of winners in football has become more difficult in the latter half of the eighties. In terms of margins this is even more apparent. A comparison of 1980 and 1991 absolute margins is shown in Figure 5.2. Clearly the proportion of large winning margins has increased. Most percentiles have increased by 10 to 20%, with both the mean and median margins increasing by over seven points.

Quantiles

maximum	100.0%	131.00
90.0%		72.40
quartile	75.0%	44.00
median	50.0%	7.00
quartile	25.0%	-27.50
10.0%		-52.00
minimum	0.0%	-157.00

Moments

Mean	8.3697
Std Dev	51.6123

Figure 5.1. Distribution of home team winning margins in 1991

1980 1991

Quantiles

maximum 100.0%	152.00	maximum 100.0%	157.00
97.5%	116.70	97.5%	125.55
90.0%	77.00	90.0%	84.80
quartile 75.0%	49.75	quartile 75.0%	58.00
median 50.0%	29.00	median 50.0%	36.00
quartile 25.0%	11.00	quartile 25.0%	15.00
10.0%	5.00	10.0%	6.00
minimum 0.0%	0.00	minimum 0.0%	0.00

Moments

Mean	34.2500	Mean	41.2667
Std Dev	29.4474	Std Dev	32.0021
N	132.0000	N	165.0000

Figure 5.2. Comparison of absolute margins in 1980 and 1991

Selecting matches with the greatest margins gives a possible reason for the change. The matches with the greatest winning margins (over 75 points) are shown in Table 5.1. Eighteen out of 21 of these matches involve an interstate team - an effect entirely absent when the author started tipping. (In addition, the round 21 match was actually played in Tasmania).

TABLE 5.1. Matches resulting in a margin greater than 75 points

Round	Home team	Away team	Result
1	Adel	Haw	86
1	WC	Melb	79
2	Haw	Syd	91
2	Fitz	Melb	-131
4	Bris	Geel	-102
6	Fitz	Haw	-157
7	Haw	WC	-82
7	St.K	Adel	131
8	Fitz	Syd	-77
9	WC	Fitz	99
11	Geel	Adel	84
13	WC	Foot	118
13	Haw	Bris	87
14	Coll	Syd	99
15	Coll	Adel	123
15	Syd	Melb	-83

17	WC	Coll	81
19	Geel	Bris	101
20	Bris	Coll	-101
21	Haw	Fitz	126
23	Carl	Haw	-96
23	St.K	Bris	120
24	Ess	Haw	-80

5.3. Prediction accuracy

5.3.1. Winners

In 1991 the computer correctly selected 116 winners out of 165 home and away matches, and five out of seven finals. At just over 70% correct this is slightly better than the decade average for a computer tip reported in Stefani & Clarke (1991).

5.3.2. Margins

Figure 5.3 shows the relationship between the predicted and the actual margin. The fit accounts for about 25% of the variation. Given that the prediction takes account of team ability, current form and ground advantage there is still a large degree of unexplained or random variation. Computer predictions, because they are predicting the expected score, will never have the variation shown by the actual values. Figure 5.4 demonstrates this, but also gives an idea of the spread of results for predictions in given ranges.

Summary of Linear Fit

Rsquare .2589047
Root Mean Square Error 44.59554
Mean of Response 8.357575

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	2.1448566	3.56804	0.60	0.5486
Predicted margin	.89372157	.118433	7.55	0.0000

Figure 5.3. Actual margin versus predicted margin

We now look at the distribution of errors, defined as the difference between forecast and actual home ground margin. Figure 5.5 shows the distribution of errors. Note that the mean error is still slightly negative although not significantly so, and the median error is -5.00. This implies that the HA is possibly not large enough - the computer may still be adjusting to interstate teams and their large HA. The table shows the median absolute error is 30, with a mean of 36. Thus half the time the computer is less than five goals out.

Predicted home margin Actual Home margin

Figure 5.4. Distribution of actual margins for ranges of predicted margins

actual errors absolute errors

Quantiles

maximum 100.0% 117.00 maximum 100.0% 124.00

90.0% 57.40 90.0% 73.40

quartile 75.0% 29.00 quartile 75.0% 51.00

median 50.0% -5.00 median 50.0% 30.00

quartile 25.0% -30.50 quartile 25.0% 14.00

10.0% -59.00 10.0% 6.00

minimum 0.0% -124.00 minimum 0.0% 0.00

Moments

Mean -1.4061 Mean 35.4424

Std Dev 44.5691 Std Dev 26.9177

N 165.0000 N 165.0000

Figure 5.5. Distribution of errors

5.3.3. Final ladder predictions

Although not usually published, the computer also predicts in each round the final ladder at the end of the home and away season. Given the intricacies of the draw, this is one area where the computer should have advantages over human tipsters. Unfortunately, expert predictions of final ladder position are usually only published at the beginning of the season. Figure 5.6 shows the final ladder predictions before each of the 24 rounds. The teams are in order of actual finishing position. The computer clearly has more trouble with the middle of the ladder rather than the very top and bottom. Defining a prediction to be close if within one of the true final position, the final row shows the steady improvement through the season. After 4 rounds over half the teams are predicted closely, and by round 17 about 12 out of 15 teams are closely predicted.

number >1=N=N=N=N=N

game away=M=N=V=N=M=V=M=V=R=S=P=S=R=R=T=P=Q=Q=N=O=N=N=M
M=M

Chart symbol is the first letter of the team name

=

Figure 5.6. Predicted final position by round

5.4. Comparison with human tipsters

Table 5.2 shows the number of correct winners and percentage correct for all the tipsters in The Age and The Sun. In some cases (such as leader of the Opposition) selections from different people have been combined. Draws are counted as half correct. For the home and away matches the computer correctly selected 116 winners out of 165 matches, a success rate of 70.3%. Of The Age tipsters, the nearest to this was Ron Carter with 111 or 67.3%. Only two of The Sun experts, and one of the celebrities beat the computer, with another two celebrities choosing the same number of winners. In interpreting a table such as this, it should be borne in mind that in selecting 165 matches, each with a probability of success of 0.7, the number of correct choices will have a standard deviation of about 6. As the computer gives its own estimate p_k of the probability of success for the prediction for match k , the mean and variance of the number correct over the season is $\bar{x} = 121.7$ and $s^2 = 29.35$, giving a standard deviation of 5.4. Thus by the computer's own estimates it had an unlucky year. (In fact the high value of \bar{x} is probably an indication that the probability estimates need updating. With the general increase in margins as discussed earlier, a predicted win of 20 points (say) implies a lesser chance of winning than it did 10 years ago. Thus the computer is probably over estimating the chance of selected teams winning). I suspect that differences between commentators in number of winners less than about five are probably insignificant. Nevertheless, the general public don't see it this way, and it is better to be on top of the table than on the bottom.

Table 5.2 also shows the total and average absolute errors of the margin predictions for The Sun tipsters. Only one expert and one celebrity performed better than the computer. (Although perhaps the computer is more intelligent than we give it credit for, and thought it politic to come in just behind the Prime Minister).

TABLE 5.2. Accuracy of The Age and The Sun tipsters

Tipster	Number tipped	Number correct	Percentage correct	Total deviation	Average deviation
Computer	165	116	70.3	5848	35.4
<i>Age experts</i>					
Ron Carter	165	111	67.3		
Greg Baum	110	74	67.3		
Nick Johnson	76	51	67.1		
Gary Linnel	74	49.5	66.9		
Martin Blake	153	102	66.7		
Steve Linnel	102	67.5	66.2		
Len Johnson	156	103	66.0		
Penny Crisp	95	62.5	65.8		
Patrick Smithers	55	36	65.5		
Peter Schwab	7	3.5	50.0		
<i>Sun Experts</i>					

Geoff Poulter	158	115	72.8 *	5476	34.7 *
Ron Reed	158	109	69.0	5702	36.1
Ron Barassi	165	117	70.9 *	5898	35.8
Bruce Matthews	158	109	69.0	5611	35.5
Niall/Pierce	165	113	68.5	6333	38.4
Don Scott	165	111	67.3	6040	36.6
Tony De Bolfo	165	110	66.7	6038	36.6
Daryl Timms	165	109	66.1	6135	37.2
Crackers Keenan	165	107	64.9	5941	36.0
Michael Stevens	165	107	64.9	6170	37.4
Lou Richards	165	103	62.4	6514	39.5
Eva/Atkins /West.	158	101	61.2	5750	36.4
<i>Sun Celebrities</i>					
Joan Kirner	165	118	71.5 *	5909	35.8
Bob Hawke	165	116	70.3	5839	35.4 *
Wynne/Meldrum	165	116	70.3	5943	36.0
David Johnston	165	113	68.5	6111	37.0
John Hewson	165	112	67.9	6019	36.5
Daryl Somers	165	111	67.3	6001	36.4

Mary Delahunty	165	110	66.7	6223	37.3
Steve Vizard	165	104	63.0	6455	39.1
Brown/Kennett	165	98	59.4	6863	41.6

* Better performance than the computer

5.4.1. Reasons for computer supremacy

Figure 5.4 shows that the distribution of the computer margin prediction is roughly the same shape as that of the actual margins, with the same mean but a lesser variance. This is not true of many human tipsters, who often have a distinctly bi-modal distribution of predicted margins. There appears to be an aversion to predicting close margins. In addition, some tipsters tend to choose multiples of 10 or 6 points for the margins. One reason the computer may perform better than experts is that it has no loyalties to particular teams. While no data is available on the teams followed by many of the experts, there is evidence to suggest that tipsters are certainly influenced (to their detriment) by the teams they follow. Figure 5.7 shows a graph of the number of times Lou Richards selected each team and the number of wins for each team. Clearly Lou favours Collingwood, the team he barracks for. This graph is typical of all the celebrities. With the exception of Bob Hawke, all celebrities selected the team they followed more often than they won, the excess ranging from 5 to 9 wins.

Figure 5.7. Lou Richards' predicted and actual number of wins for each team

It is well known that supporters look for any reason to convince themselves that their team will win next week. Nevertheless it is interesting that football followers predict most poorly the performance of the team they know most about. One reason humans may choose poorly is that they know too much information, and they overrate the importance of much of it. The return of a

player from absence due to injury, good training form, a perceived after effect of a bye, etc might also be given too much weight by experts. However all the forecasts show a correlation of 2009 are equivalent to only 1.56 independent forecasts. It would be interesting to look at the correlations between the margin tips of experts, to see if the tips of those with shared information (such as expert tipsters from The Sun), are more closely correlated within groups than between groups.

5.5. Conclusion

An analysis has shown the computer's performance in predicting the winner and margins in 1991 was better than the average expert or football follower. The computer uses only the previous match results and is not influenced by publicity surrounding particular events, nor club loyalties. As such it is likely to be more independent than the experts, and the single computer tip may provide more extra information to followers than the many additional human experts. Computer forecasts of sporting events provide an interesting, objective and useful alternative to the human expert.

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5.6. Commentary

While no formal studies have been undertaken since 1991, the computer has generally remained in the upper half of the expert tipsters range. In 1995 the computer was second with 127 winners out of all the expert tipsters in The Sun and The Age, and then selected eight out of nine finals correctly. In 1996 it was again in the top few tipsters with 126 winners, and selected all nine finals correctly. 1997 proved a difficult year for all tipsters, with the computers 108 winners beating about a quarter of the expert tipsters.