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Market efficiency and continuous information arrival: evidence from prediction markets

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Abstract

Two regularities in financial economics are that prices underreact to news events and that they display short term momentum. This article tests for the presence of these regularities in prediction markets offered by the betting exchange Betfair on the 2008 Ryder Cup Golf Competition. Betfair offered in play prediction markets on the individual match play pairings and on the Cup result, with trading being virtually continuous in all markets. Modelled probabilities of the Cup result were updated continuously using trades in the individual match play pairings. These probabilities were then compared with the probabilities of the Cup result implied by odds in that market. The odds in the market for the Cup result underreact to both good and bad news that is provided by changes in the odds in the markets for the individual pairings. Further, these modelled probabilities Granger cause changes in the probabilities of the Cup result implied by

odds in the market on that outcome. In addition, economically and statistically significant evidence of momentum is found in the odds in the market on the Cup result.

Keywords:

market efficiency | prediction markets | informational arrival

JEL Classification::

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Notes

[1] Over very short horizons, negative autocorrelation is found (Jegadeesh, 1990; Lehmann, 1990). This finding is attributed to bid-ask spreads and other measurement problems (Kaul and Nimalendran, 1990). While this article examines a very short horizon the results are robust to these measurement problems.

[2] The time 4:00 am in Kentucky corresponds to 8:00 am London time. The robustness of the results was examined by defining the start of the in-play period as 1:09 pm (the tee-off time of the seventh pairing) and 2:04 pm (the tee-off time of the final pairing). The results were substantively unchanged.

[3] For example, the implied probability of the US winning the overall Cup may be calculated as

where $PROB_{US}$ is the probability of the US winning the overall Cup, $ODDS_{US}$ is the overall Cup market odds for a win to the US, $ODDS_{EUR}$ is the overall Cup market odds for a win to Europe and $ODDS_{TIE}$ is the overall Cup market odds for a tied outcome.

Dividing by the sum of the reciprocal of the odds ensures that the implied probabilities of the three outcomes (US win, European win and tie) sum to unity. For a detailed discussion of this approach see, for example, Wolfers and Zitzewitz (2006).

[4] These tests and all subsequent tests reported in this article were also undertaken for the probabilities of Europe winning the competition and for the probabilities of a tie. These results are substantively the same as those for the US and for the sake of brevity are not reported.

[5] For more information regarding FPE and AIC, see Hsaio (1981) and Akaike (1974), respectively. The formulae used to determined the optimal lag length according to each search criteria may be specified as follows:

where T is the sample size, n the lag-length being tested and SSR is the sum of squared residuals.

[6] As noted in footnote 2, this result is not attributable to bid–ask spreads or other measurement problems – problems that result in negative autocorrelation.