Analysis of Daily Illini College Football Predictions: Accuracy of Forecasters and Betting Line

Yayu Zhou, Qing Ma, Faculty Advisor: A.J. Hildebrand (University of Illinois at Urbana-Champaign)

University of Illinois Undergraduate Research Symposium, April 21, 2016

PREVIOUS WORK

- **NFL predictions**: betting line (65%) outperforms statistical model (62%) and sports editors (60%) based on 1212 observations (Boulier & Stekler, 2003).
- **World Cup Soccer predictions**: There is no statistical significance between the performance of experts and non-experts in predicting the outcomes of the Soccer World Cup 2002 (Andersson et al., 2005).
- **German Soccer predictions:** Prediction markets and betting odds perform equally well, but both strongly outperform tipsters (Spann & Skiera, 2009).

DESCRIPTION OF DATA

- **Data Source**: Daily Illini College Football Predictions, obtained from archived copies of Daily Illini. The betting line data were obtained from the website: www.goldsheet.com.
- **6 years** analyzed (2008-2013)
- **346 games** predicted during 2008-2013
- **29 forecasters**, each predicted 55-60 games
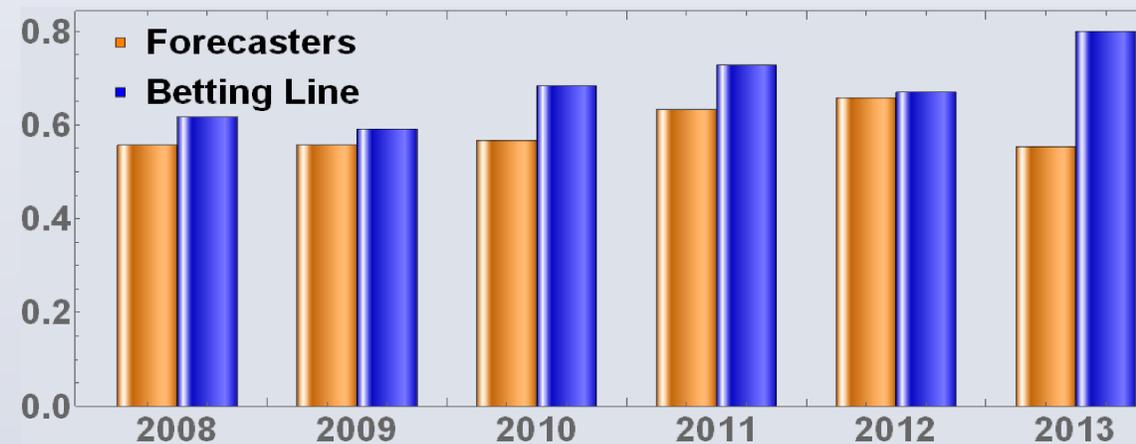- **1740 predictions** analyzed

METHODOLOGY

- **Accuracy Rates:** for a given subset of the data (e.g., predictions in 2010), we computed the proportion of correctly predicted games by DI forecasters and by the betting line (i.e., predicting the favorite team to win).
- **Testing Method**: Accuracies were compared using a two-tail z-test for equality of means.
- **Significance Levels**: For each comparison, the corresponding p-value was computed. Results with $p < 0.01$ and $p < 0.05$ were identified as significant at the 1% and 5% significance level.
- **Handling Noise in Data**: A small percentage (<1%) of the prediction data seem to be incomplete or erroneous. We assigned a 50% accuracy to those data points.

SAMPLE DATA: DAILY ILLINI COLLEGE FOOTBALL PREDICTIONS, 09/17/2015

RESULTS: FORECASTERS VS BETTING LINE BY YEAR

- **Accuracies of forecasts for different years**: The accuracy of forecasters was **lower** than that of the betting line in all 6 years. In 3 of these years (2008, 2010, 2013) the difference was **statistically significant** at the 5% significance level.

ILLINOIS VS NON-ILLINOIS GAMES

BIG-TEN VS NON BIG-TEN GAMES

- **Accuracies for games involving Illinois or Big Ten teams:** The accuracy of forecasters for Illinois games was **significantly higher** than that for the Non-Illinois games (64.5% vs 57.4%) at the 1% significance level. A similar discrepancy was observed for games involving Big Ten teams.

SUMMARY OF RESULTS

- **Overall accuracy:** The accuracy of forecasters was **significantly lower** than that of the betting line (58.9% vs 68.6%) at the 1% significance level.
- **Accuracy of individual forecasters:** Among 29 forecasters, only 1 had significantly **higher** accuracy than the betting line at the 5% significance level; 10 had significantly **lower** accuracy than the betting line at the 5% significance level.
- **Accuracy of predicted scores:** The mean absolute error in the predicted score difference of forecasters was **significantly higher** than that of the betting line (16.3 vs 12.3) at the 5% significance level.
- **Accuracies for games involving Illinois:** The accuracy of forecasters for Illinois games was **significantly higher** than that for the Non-Illinois games (64.5% vs 57.4%) at the 1% significance level.

REFERENCES

- **Andersson, P., Edman, J., & Ekman, M. (2005).** *Predicting the World Cup 2002 in Soccer: performance and confidence of experts and non-experts.* International Journal of Forecasting, 21, 565-576.
- **Boulier, B. L., & Stekler, H. O. (2003).** *Predicting the outcomes of National Football League games.* International Journal of Forecasting, 19, 257–270.
- **Spann, M., & Skiera, B. (2009).** *Sports Forecasting: A Comparison of the Forecast Accuracy of Prediction Markets, Betting Odds and Tipsters.* Journal of Forecasting, 28, 55-72.
- *The Daily Illini.* Urbana, Illinois (2008-2013).
- **The Gold Sheet**. Retrieved December 6, 2015, from http://goldsheet.stats.com/cfb

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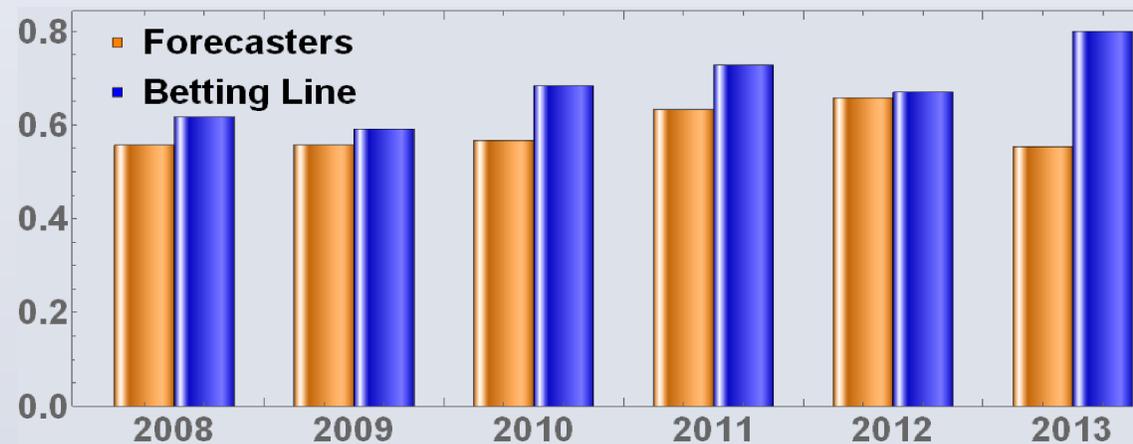- **1740 predictions** analyzed

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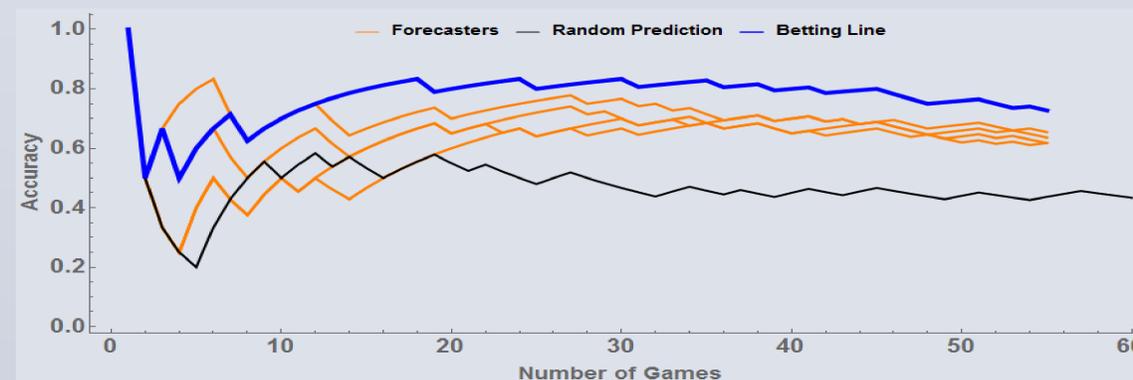## SAMPLE DATA: DAILY ILLINI COLLEGE FOOTBALL PREDICTIONS, 09/17/2015

OVERALL ACCURACY OF FORECASTERS VS BETTING LINE BY YEAR

- The accuracy of forecasters was **lower** than that of the betting line in all 6 years. In 3 of these years (2010, 2011, 2013) the difference was **statistically significant** with p-values < 0.02 in all cases.

INDIVIDUAL FORECASTERS VS BETTING LINE AND RANDOM PREDICTION

- The graph shows the accuracy rates of all DI forecasters, the betting line, and a random prediction during the 2011 season.

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