

Report on Bachelor Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University

Student:	Jakub Čakan
Advisor:	PhDr. Jiří Kukačka, Ph.D.
Title of the thesis:	Hot hand bias in Czech sports betting market

OVERALL ASSESSMENT (provided in English, Czech, or Slovak):

Short summary

The thesis by Jakub Čakan examines the presence of the “hot hand” bias within the Czech sports betting market. It investigates two key hypotheses: whether the market efficiently incorporates all relevant information into the betting odds, and how the “hot hand” belief influences bettors’ behavior. The study finds that while bookmakers efficiently reflect comprehensive information in their odds, confirming market efficiency, bettors exhibit a significant “hot hand” bias. This bias leads bettors to overvalue teams on winning streaks, resulting in an overreaction to recent performances and inefficiency on their part. Additionally, the thesis explores the profitability of betting strategies designed to exploit these biases but concludes that such strategies do not consistently yield profits, highlighting the complexity of betting markets and the difficulty in exploiting behavioral biases.

Contribution

By providing a detailed analysis using unique proprietary Tipsport data from the Czech sports betting market, this research contributes to our understanding of the interaction between bookmaker accuracy and bettors’ irrationality. It actually focuses on both sides: bookmaker accuracy is studied by means of a weak-form market efficiency model while bettors’ irrationality using a framework modeling the percentage distribution of bets and whether it statistically significantly depends on other variables than the natural regressor: closing decimal odds. As the main result, it provides robust empirical evidence for a long-known but still existent “hot hand” bias inefficiency in the Czech sports betting environment.

The scientific literature, in general, analyses the American sports betting market, which technical details differentiate from the European betting system. The contribution thus also lies in the application of specific models on a European sports betting market dataset and the required modification and recalculation of the underlying data. The thesis employs decimal implied probability odds that are typical for the European betting sector, whose interpretation is different from the English and American betting market, and data processing had to be adjusted accordingly.

Jakub also developed a well-designed dataset composed of a large number of 1342 observations. He requested proprietary data from Tipsport, joined them with the official database of results of the Czech football league, and had to sort out various technical issues caused by the irregularity of two seasons due to the COVID pandemic.

Methods

The thesis covers a standard range of the bachelor-curriculum-level cross-sectional estimation methods. It combines the linear probability model of market efficiency estimated with weighted least squares with an OLS regression for the percentage distribution of bets to analyze the presence of “hot hand” bias with a usual White standard errors’ correction for in-built heteroscedasticity. The F-test is used for a joint hypothesis of market efficiency.

The multicollinearity issue is only briefly discussed in the methodological part. Heteroskedasticity for the OLS regression is not econometrically tested, only analyzed visually and corrected automatically using robust SEs. While the CLM assumptions are suggested to hold, the normality of errors is not discussed, but since there are enough observations, asymptotic OLS theory applies, and no serious issues are expected.

Last, the research hypotheses are reasonably defined (pg. 3), and the regression results are correctly interpreted.

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Literature

The literature section is well-elaborated and divided into three topical areas. The first is devoted to the specifics of the sports betting sector if understood as a financial market; the second focuses on behavioral biases potentially influencing this market with a specific focus on the “hot hand” bias. Finally, it covers the notion of efficiency of this market and the technical details of its evaluation, such as datasets’ specifics or the types of econometrics models used. Overall, Jakub demonstrates familiarity with the current literature on the analyzed topic. Finally, citations are appropriately done using a standard style for economic papers.

Manuscript form

The thesis is written in decent English, standardly structured, and typeset in LaTeX. Most formatting comments from my side are considered in the final version. The bibliography section is complete and well-formatted. Referencing tables and figures is done correctly in the text; the regression tables are well-designed and self-contained. The only issue might be with the labeling of variables, which is logical but not completely intuitive (ATS, HFD...), and the reader needs to repeatedly go back to the description of the models to understand regression results.

Overall evaluation and suggested questions for the discussion during the defense

The assessed thesis fulfills the IES, Faculty of Social Sciences, Charles University bachelor-level standards. Thus, I can recommend it for the defense and suggest a grade of B.

The results of the Turnitin analysis do not indicate significant text similarity with other available sources.

Additional topics for the discussion:

- Can you explain in detail how the European betting markets differ from the American system and what specific challenges had to be overcome when applying methodology developed for the latter to the Czech betting market?
- What standard econometric tests could have been elaborated to support the results and validity of the OLS regressions?
- As one of the methodological limitations, you briefly mention the endogeneity issues in the analysis of market efficiency. Could you be more specific?

SUMMARY OF POINTS AWARDED (for details, see below):

CATEGORY	POINTS
<i>Contribution</i> (max. 30 points)	27
<i>Methods</i> (max. 30 points)	24
<i>Literature</i> (max. 20 points)	17
<i>Manuscript Form</i> (max. 20 points)	19
TOTAL POINTS (max. 100 points)	87
GRADE (A – B – C – D – E – F)	B

NAME OF THE REFEREE: Jiří Kukačka

DATE OF EVALUATION: 26. 5. 2024

Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

CONTRIBUTION: *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

METHODS: *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

MANUSCRIPT FORM: *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

Overall grading:

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F