

Detecting Anomalous Matches: An Empirical Study from National Basketball Association

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Abstract : Match fixing and anomalous sports events have increasingly threatened the integrity of professional sports, prompting concerns about existing detection methods. This study addresses prior research limitations in match fixing detection, improving the identification of potential fraudulent matches by incorporating advanced anomaly detection techniques. We develop a novel method to identify anomalous matches and player performances by examining series of matches, such as playoffs. Additionally, we investigate bettors' potential profits when avoiding anomaly matches and explore factors behind unusual player performances. Our literature review covers match fixing detection, match outcome forecasting models, and anomaly detection methods, underscoring current limitations and proposing a new sports anomaly detection method. Our findings reveal anomalous series in the 2022 NBA playoffs, with the Phoenix Suns vs Dallas Mavericks series having the lowest natural occurrence probability. We identify abnormal player performances and bettors' profits significantly decrease when post-season matches are included. This study contributes by developing a new approach to detect anomalous matches and player performances, and assisting investigators in identifying responsible parties. While we cannot conclusively establish reasons behind unusual player performances, our findings suggest factors such as team financial difficulties, executive mismanagement, and individual player contract issues.

Keywords : anomaly match detection, match fixing, match outcome forecasting, problematic players identification

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