

# (Money)ball is Life – Point Spread Prediction

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## Overview

Our goal was to predict NCAA men's basketball point spreads (home score – away score) using team efficiency metrics. We focused on building a simple, interpretable model that captures relative team strength while avoiding overfitting on a small dataset. We used historical ACC game results and opponent-adjusted team statistics to train a regression model and generate predictions for upcoming ACC games.

## Data and Preprocessing

We used three datasets: Historical ACC 2025-26 game scores; 2025-26 team efficiency metrics; the submission schedule. We defined the response variable as:

[ spread = home points - away points ]

A significant portion of preprocessing involved cleaning team names so that game data and team statistics matched. For example: “Pitt” → “Pittsburgh”

## Predictor Variables

We used opponent-adjusted efficiency metrics. Rather than using raw values, we constructed *home-away differences*. Using differences directly models relative strength, which aligns with how betting spreads are determined.

- **ADJOE** – Adjusted Offensive Efficiency → adjoe\_diff
- **ADJDE** – Adjusted Defensive Efficiency → adjde\_diff
- **ADJT** – Adjusted Tempo → tempo\_diff

## Model

We fit a linear regression model:

[ spread adjoe\_diff + adjde\_diff + tempo\_diff ]

We initially tested additional predictors (e.g., BARTHAG) but removed them when they added little predictive value and risked overfitting. We chose linear regression because of the small size of the dataset (~85 games), for ease of interpretability, and simplification of the model.

## Evaluation

We used an 80/20 train-test split. Performance metric mirrored the competition's evaluation methods i.e. **Mean Absolute Error (MAE)**. We achieved a baseline test MAE ~8 points, while large misses were concentrated in a few blowout games

We checked for systemic bias and observed that predictions slightly overestimated home performance. We tested small adjustments but avoided tuning heavily to the small test set to prevent overfitting.

## Limitations

Basketball results are inherently noisy, and coupled with the small dataset, this could be seen as a limitation. In addition, our model can't continuously update to include recent form, injury or roster data. In addition, extreme blowouts are hard to predict using only pre-game efficiency metrics.

## Conclusion

Opponent-adjusted efficiency differences provide meaningful signal for predicting spreads. Even a simple linear model captures a substantial portion of outcome variability. Given the limited data, we prioritized robustness and interpretability over complex machine learning methods. Future improvements could include multi-season data, recent performance trends, and injury information.