

Salary Inequality and Team Performance in MLB, the NBA, and the NFL



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Team Name: Front Office

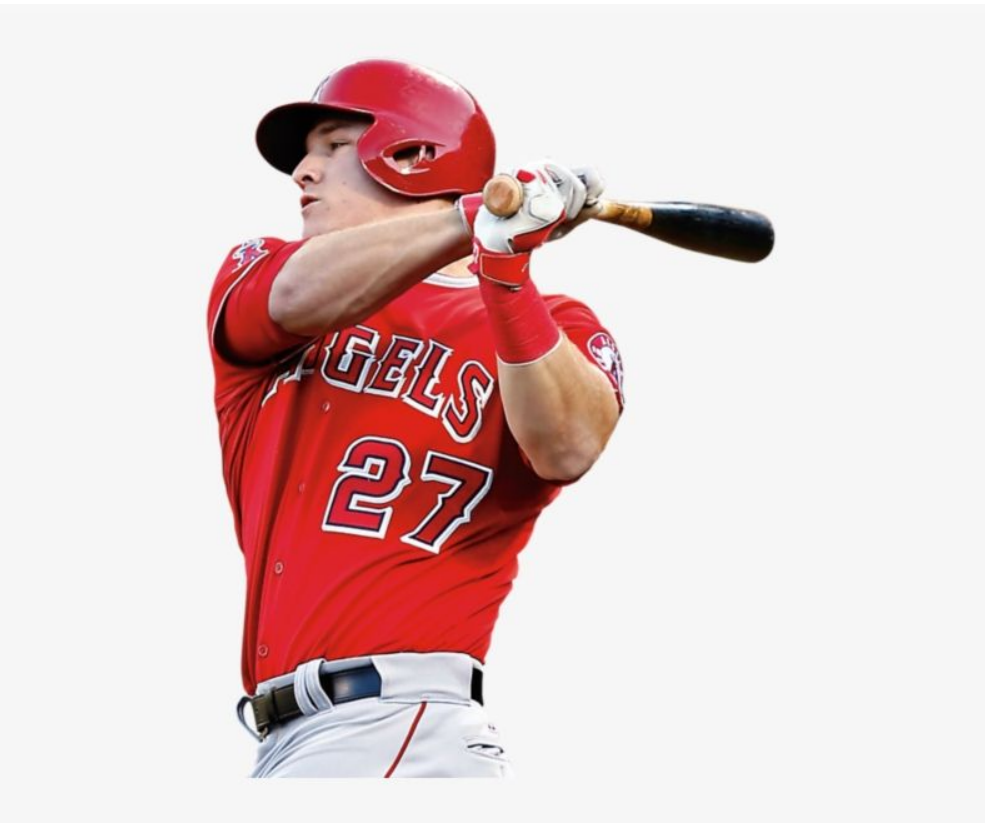
INTRODUCTION

The goal of every sports franchise is to **maximize team performance given the available budget to spend on players**. Are teams better off spending a large fraction of this budget on 1 or 2 “star” players? Or are they better off balancing their payroll by signing more “mid-level” players while lacking “star power”?



HYPOTHESIS

More inequality will be correlated with higher win rate in the NBA, but lower win rate in MLB and the NFL.



LeBron James:

8 consecutive NBA Finals appearances from 2011-2018

Mike Trout:

1 playoff appearance from 2011-2018 (lost in first round)

METHODS

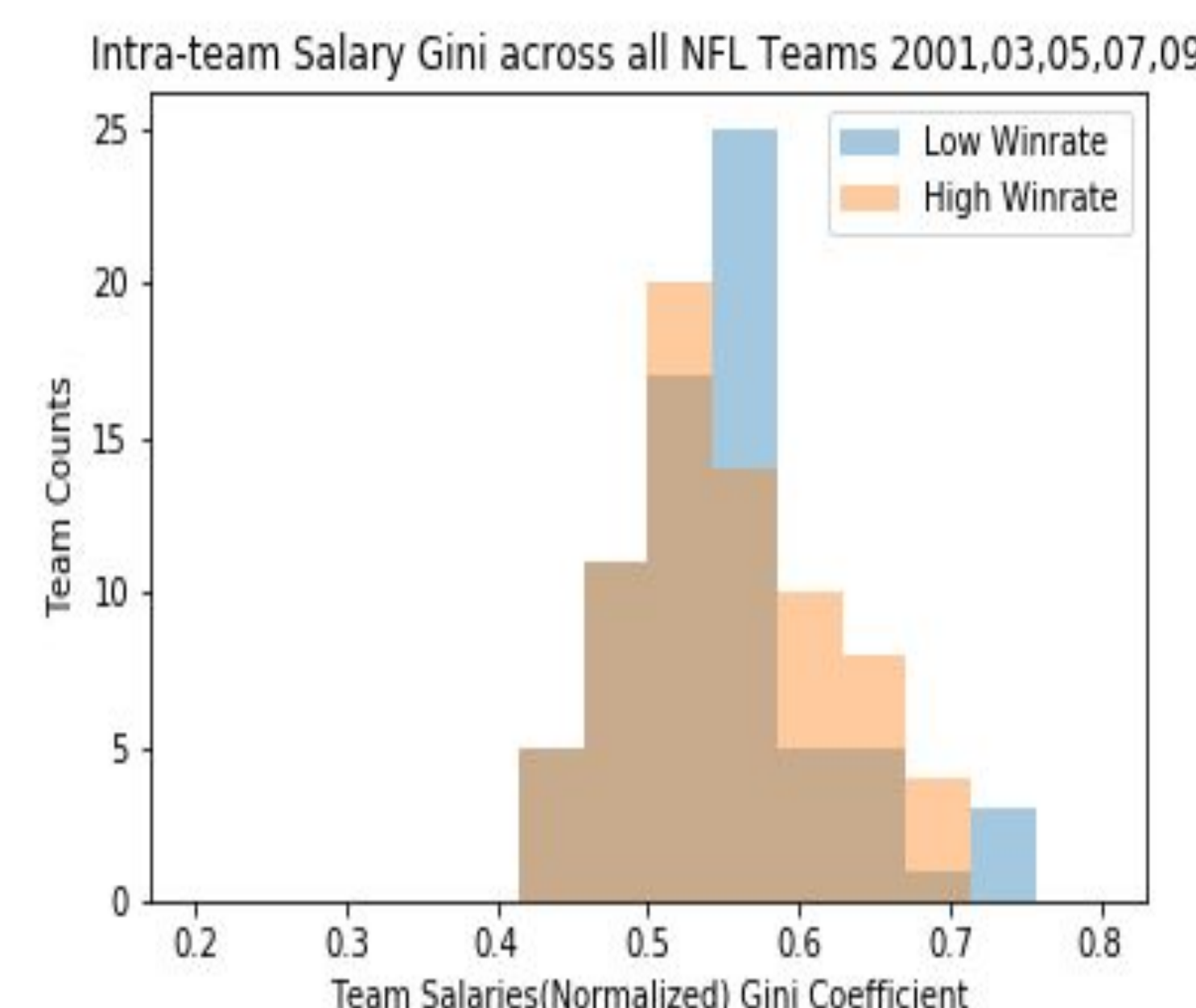
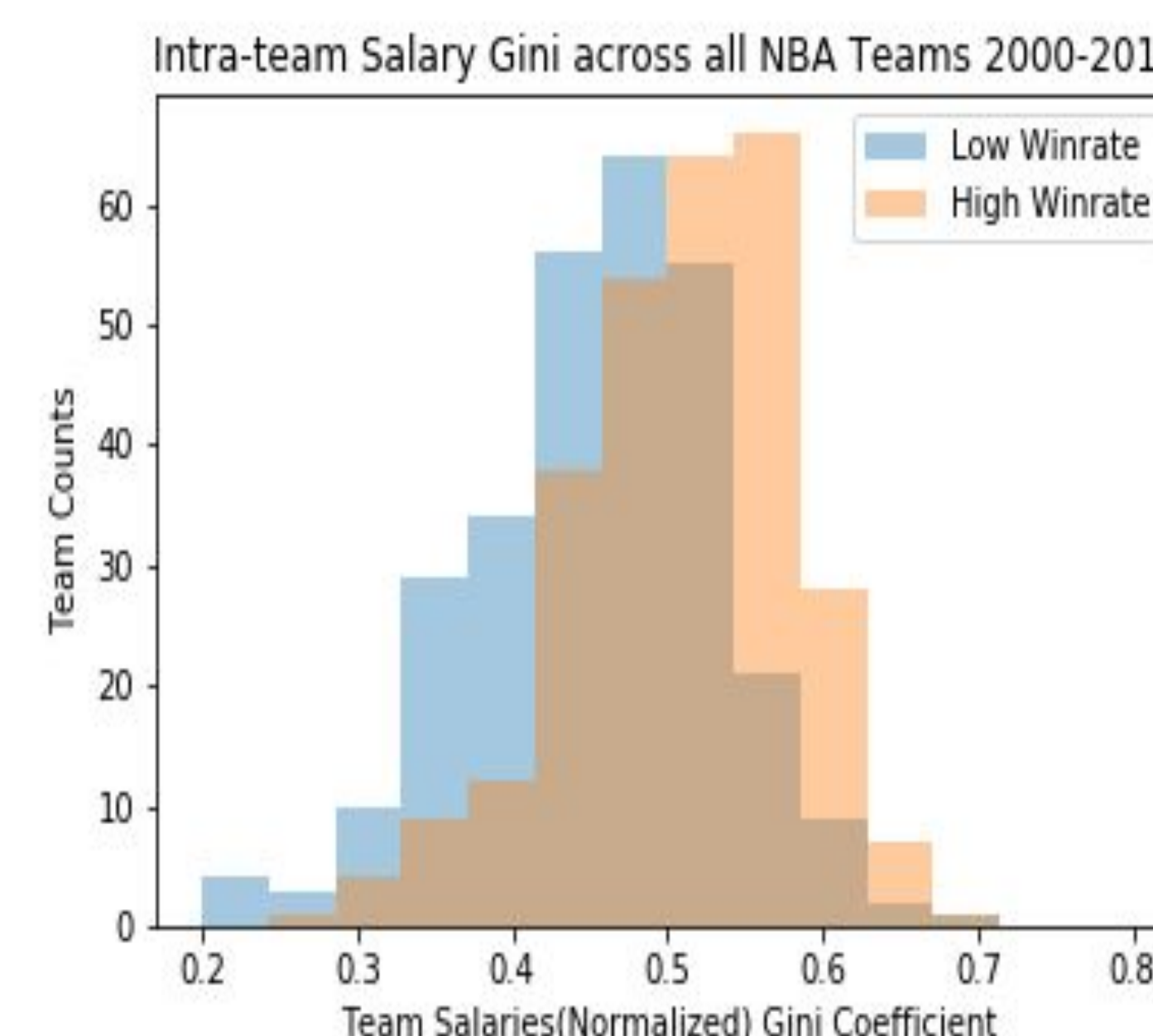
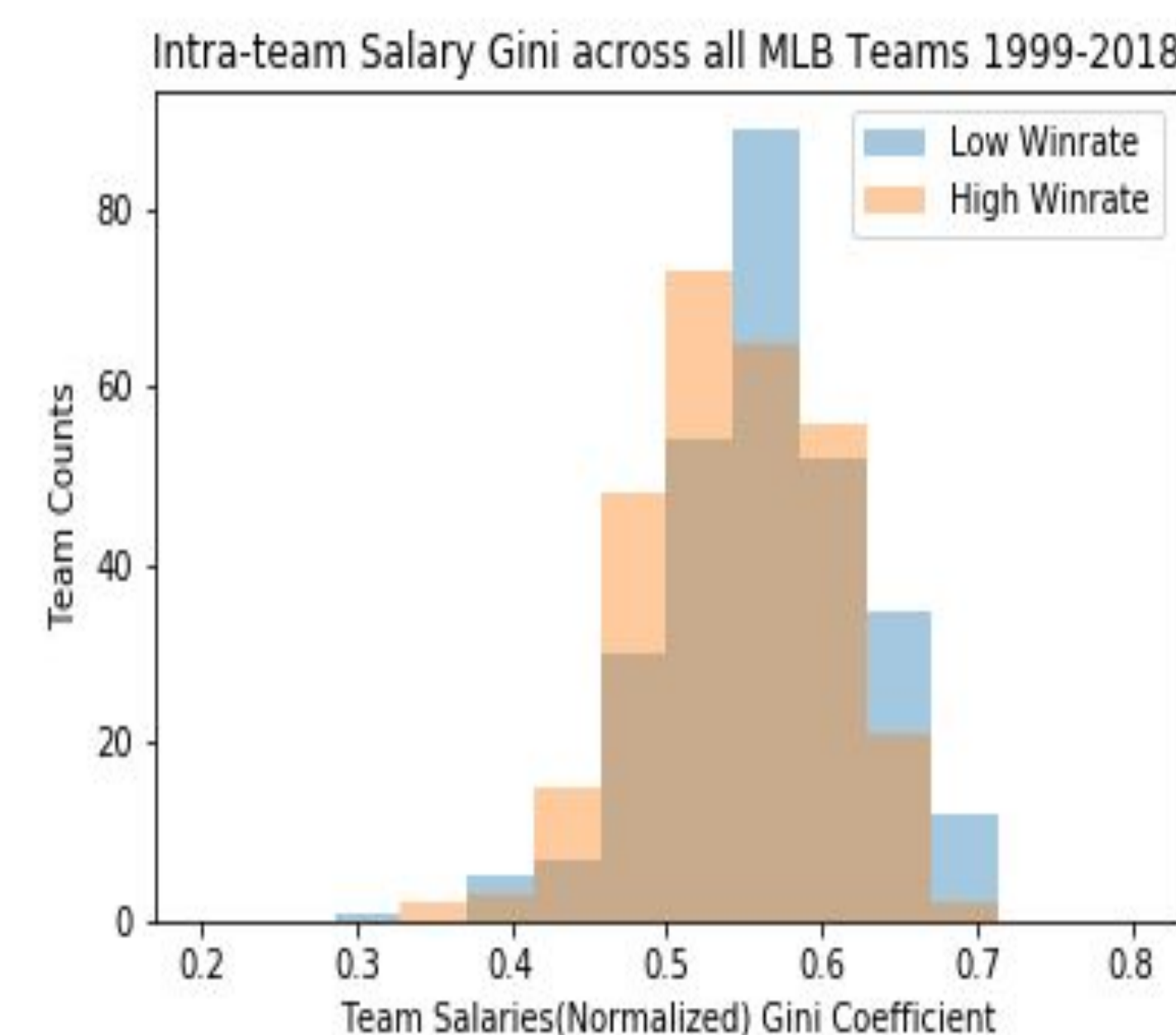
- Data scraped from **sportsreference.com** and **USA Today** (both reputable sources).
- MLB data from 1999 - 2018. NBA data from 2000 - 2019. NFL data for years 2001, '03, '05, '07, '09.
- Data collected includes player name, salary, year, team name, team abbreviation, and team win/loss record
- We use a **Gini coefficient** to measure salary inequality on a team (higher Gini means more inequality) and **win ratio** to measure team success.
- Prior to analyses, we decided to set a **significance threshold of .05**, or 5%, for all statistical tests.

RESULTS

Kolmogorov-Smirnov Test Result: The difference in salary distributions between high and low winrate teams is statistically significant in MLB and the NBA, but not in the NFL.

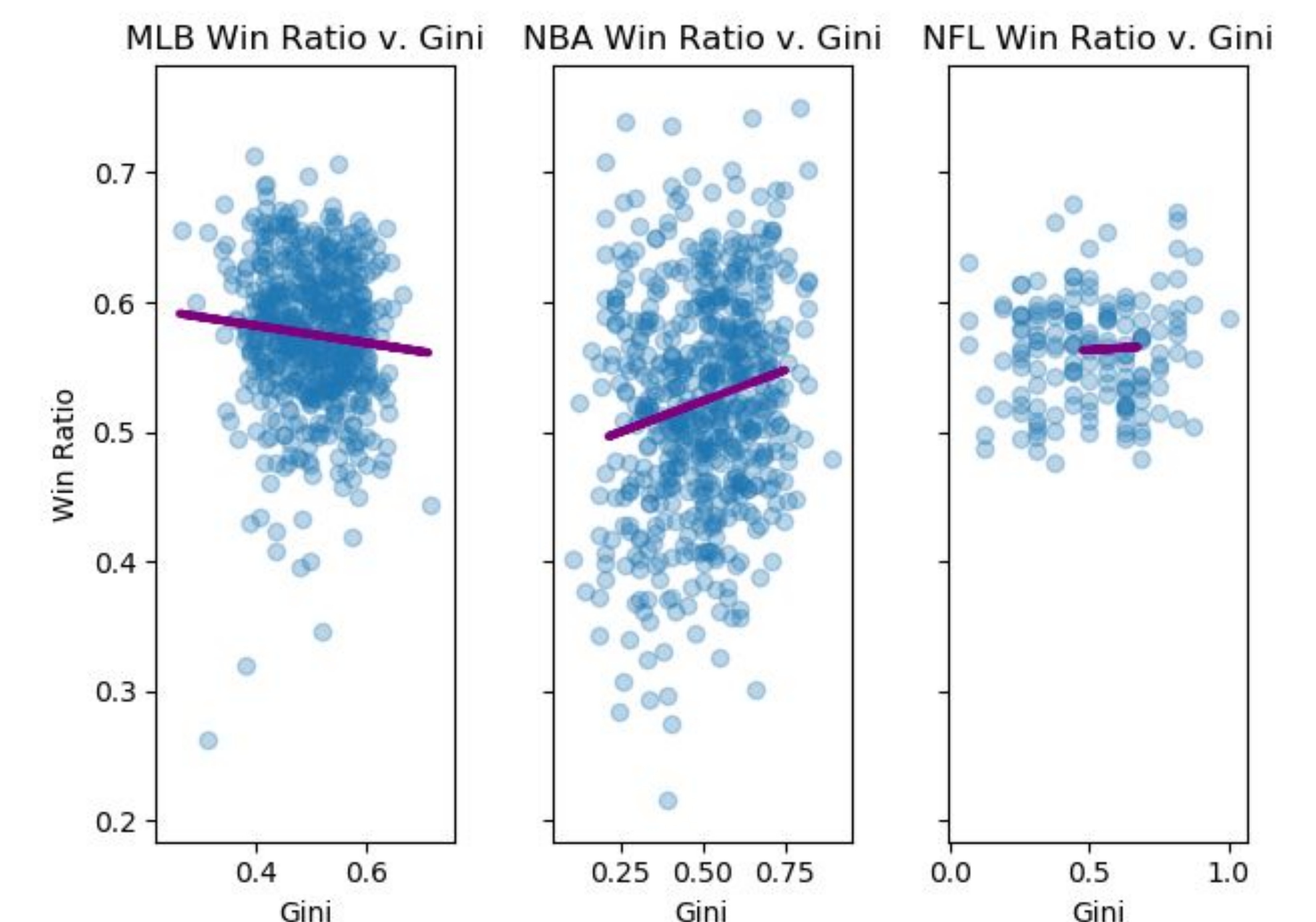
Sport	KS-test (Salary Dist.) p-value	T-test (Gini Coef.) p-value
NBA (basketball)	8.211e-17***	1.903e-15***
MLB (baseball)	8.081e-13***	0.0005***
NFL (football)	0.156	0.918

Two Sample T-Test Result: There is a statistically significant difference in the mean Gini coefficient between high win rate teams and low win rate teams in MLB and the NBA, but not in the NFL.



Multiple Regression Analysis: Gini coefficient is positively correlated with win rate (more salary inequality is correlated with better team performance) in the NBA, negatively correlated with win rate in MLB, and not significantly correlated with win rate in the NFL.

Sport	Regression Coefficient for Gini	P-value for Gini
NBA	0.1665	0.021*
MLB	-0.1173	0.016*
NFL	-0.1473	0.719



DISCUSSION and SIGNIFICANCE

- We find a positive correlation between Gini coefficient and win rate in the NBA, a negative correlation in MLB, and no significant correlation in the NFL
- The study **supports our hypotheses about MLB and the NBA, but not the NFL**
- NFL null finding could be due to lack of data
- Correlations in MLB and the NBA are **weak** but **significant**
- We make **no claims about causality** -- other explanations for correlations are possible
- NBA Front Offices might be well-advised to splurge on superstars like LeBron James
- MLB Front Offices might be wise to refrain from overspending on just one or two star players

Acknowledgments

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