Evaluating NBA Shot-Making Efficiency

Dylan Rocca, Parker Lau, Andrew Kim

Context/Overview

Motivation:

- Insufficient Traditional Metrics : FG%
- Players taking harder shots → may appear less efficient
- Need context-driven evaluation of scoring ability

Objectives

1

Build Shot quality model

Use location, defense, shot type, context

2

Compare Performance

FG% vs xFG%

Identify over- & under-performers

3

Find Regression Candidates

“Sell” → likely decline (overperforming)

“Buy” → likely improvement (underperforming)

4

Analyze Shot Profiles

Changes in role, shot difficulty, defense

5

Deliver Insights

Separate skill vs variance

Actionable player evaluations

Key Stats

xFG% - Expected Field Goal Percentage:

- Estimates probability a shot is made based on:
- Shot location
- Defender proximity
- Shot type (catch-and-shoot, pull-up, etc.)
- Game context (clock, situation)
- Serves as a benchmark for shot quality

FG% - Actual Field Goal Percentage:

- Shots made over shots taken

Comparison

- FG% > xFG% → potential elite shot-making skill
- FG% < xFG% → potential underperformance or bad variance

xFG% Example

High xFG%

Low xFG%

Key Stats

Usage - % of team possessions a player is “used” while on the court

Includes FGA, FTA, TO | Provides context for scoring efficiency

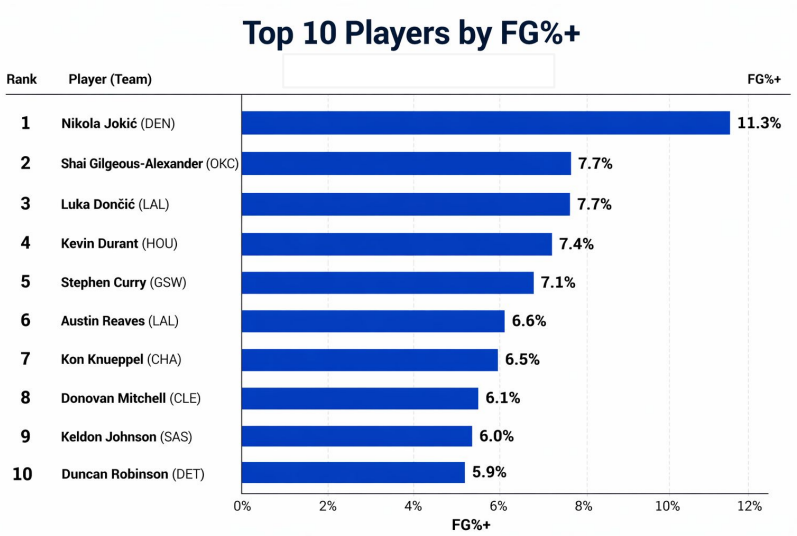
High USG% → primary offensive option (ball-dominant), could be taking tougher shots

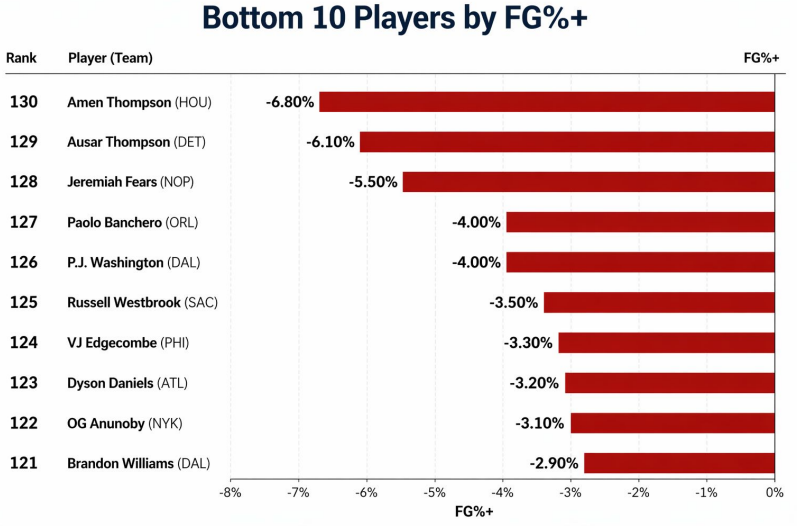
Low USG% → role player / off-ball contributor

In this project: Helps explain gaps between FG% and xFG%, Identifies players **creating** vs **benefiting** from offense

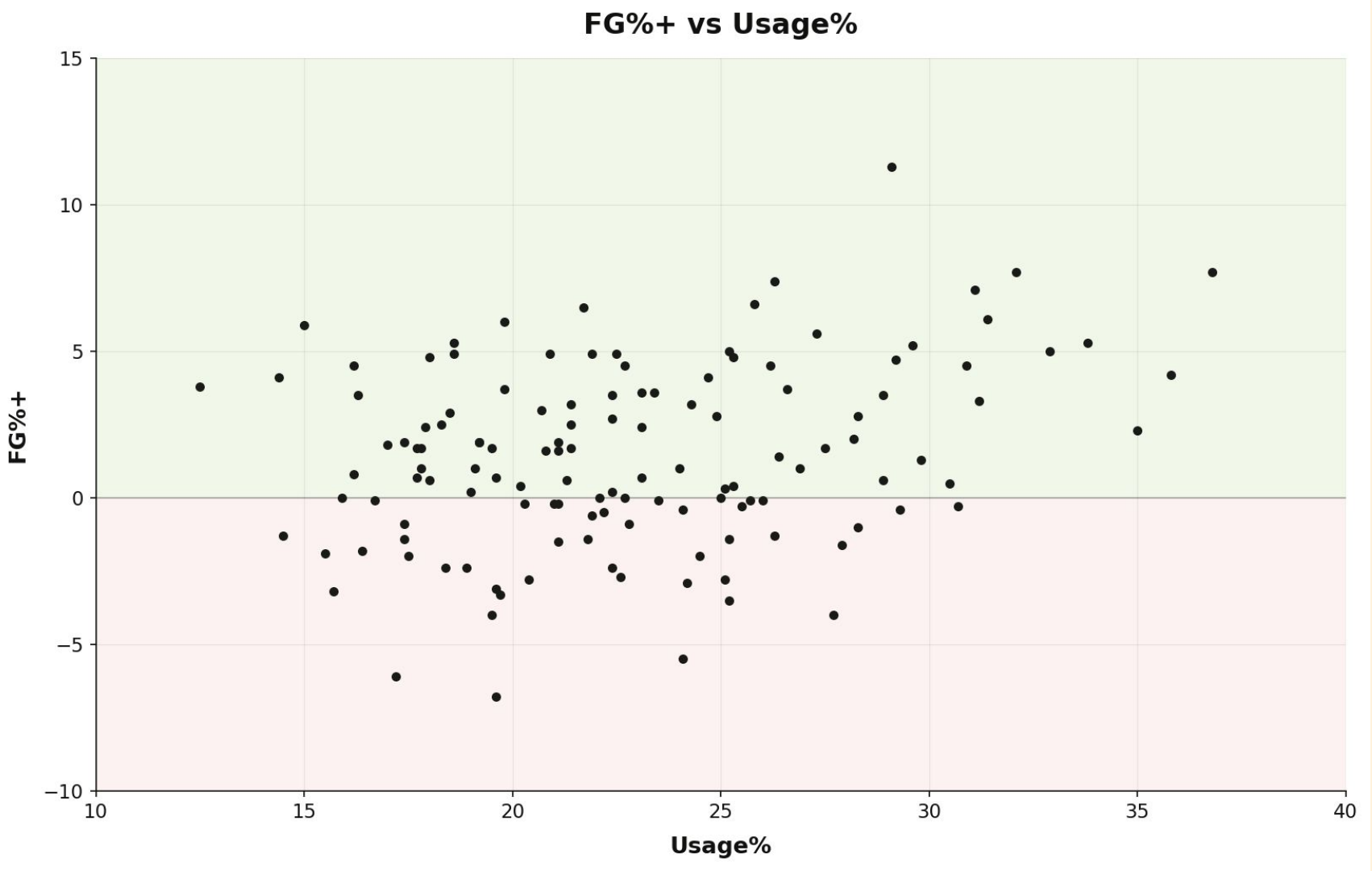
FG%+

- “Field goal percentage above expected”
- Actual FG% - xFG%
- Measures: are you more or less efficient than expected?
- Top: offensive stars / experienced players
- Bottom: players with poor shot selection
- Bad FG+% does not automatically make you a bad scorer





High FG%+ Example


FG%+ vs Usage%
FG%+
Usage%
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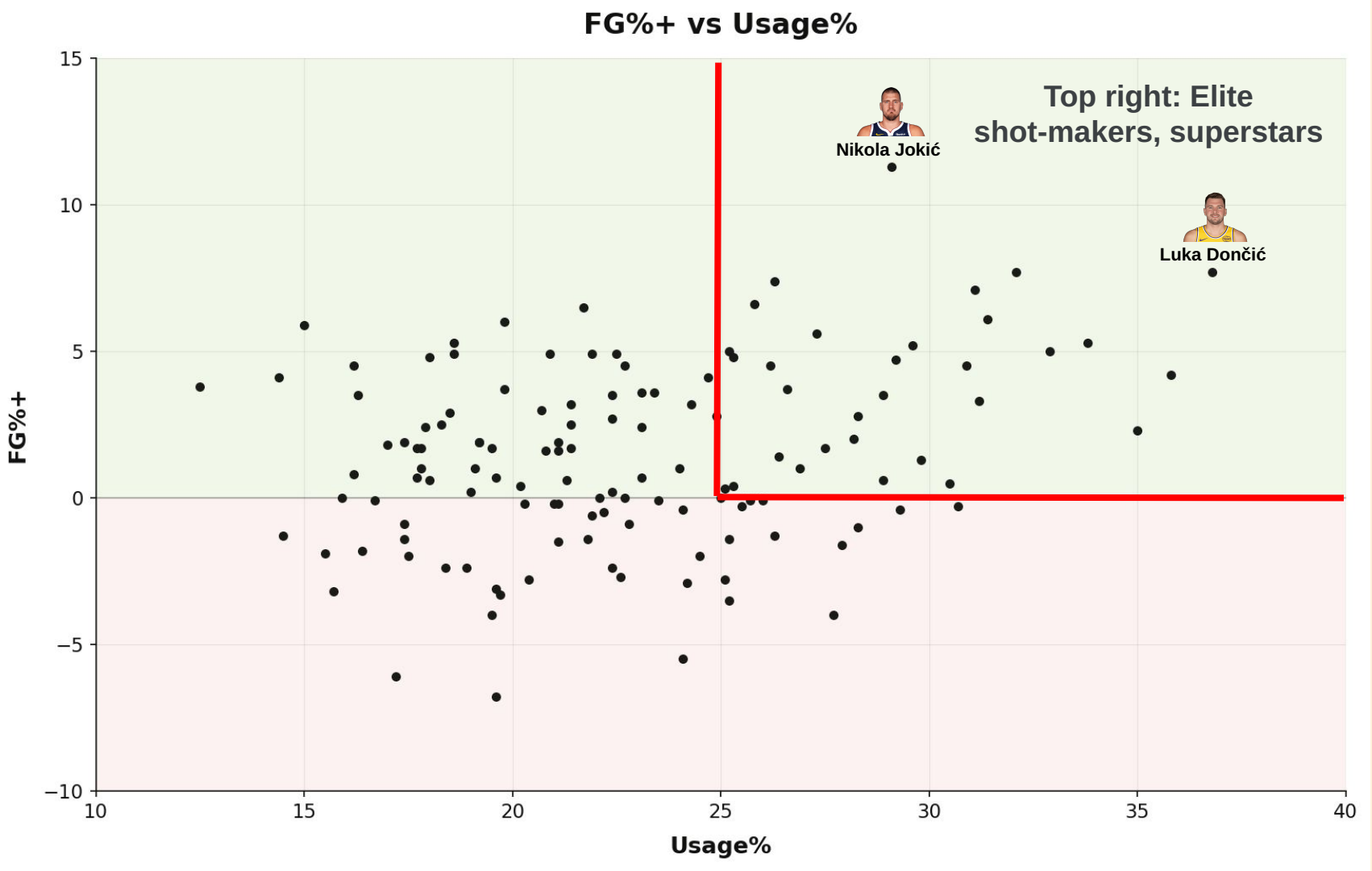
FG%+ vs Usage%
Top right: Elite shot-makers, superstars
Nikola Jokić
Luka Dončić
FG%+
Usage%
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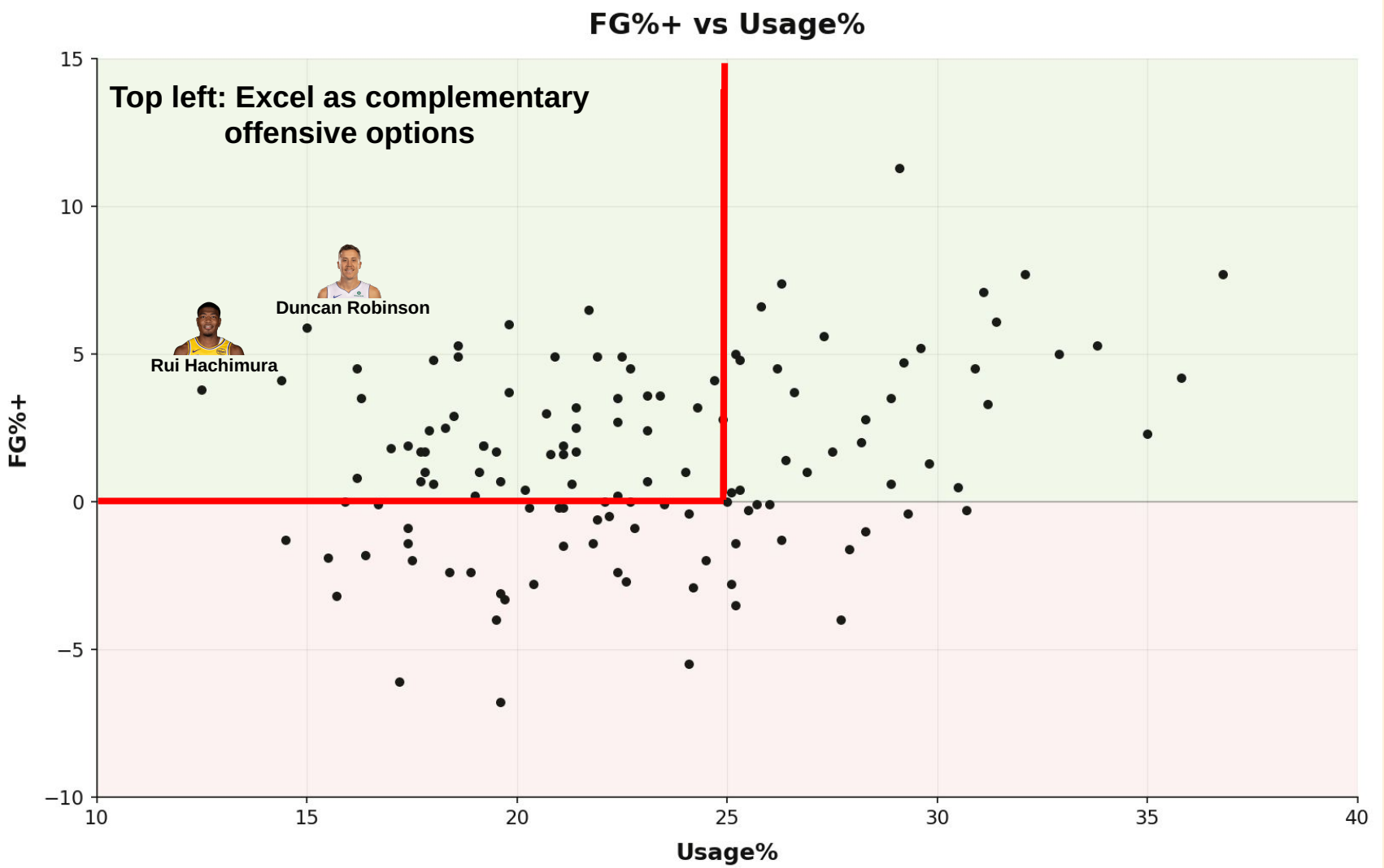
FG%+ vs Usage%
Top left: Excel as complementary offensive options
Duncan Robinson
Rui Hachimura
FG%+
Usage%
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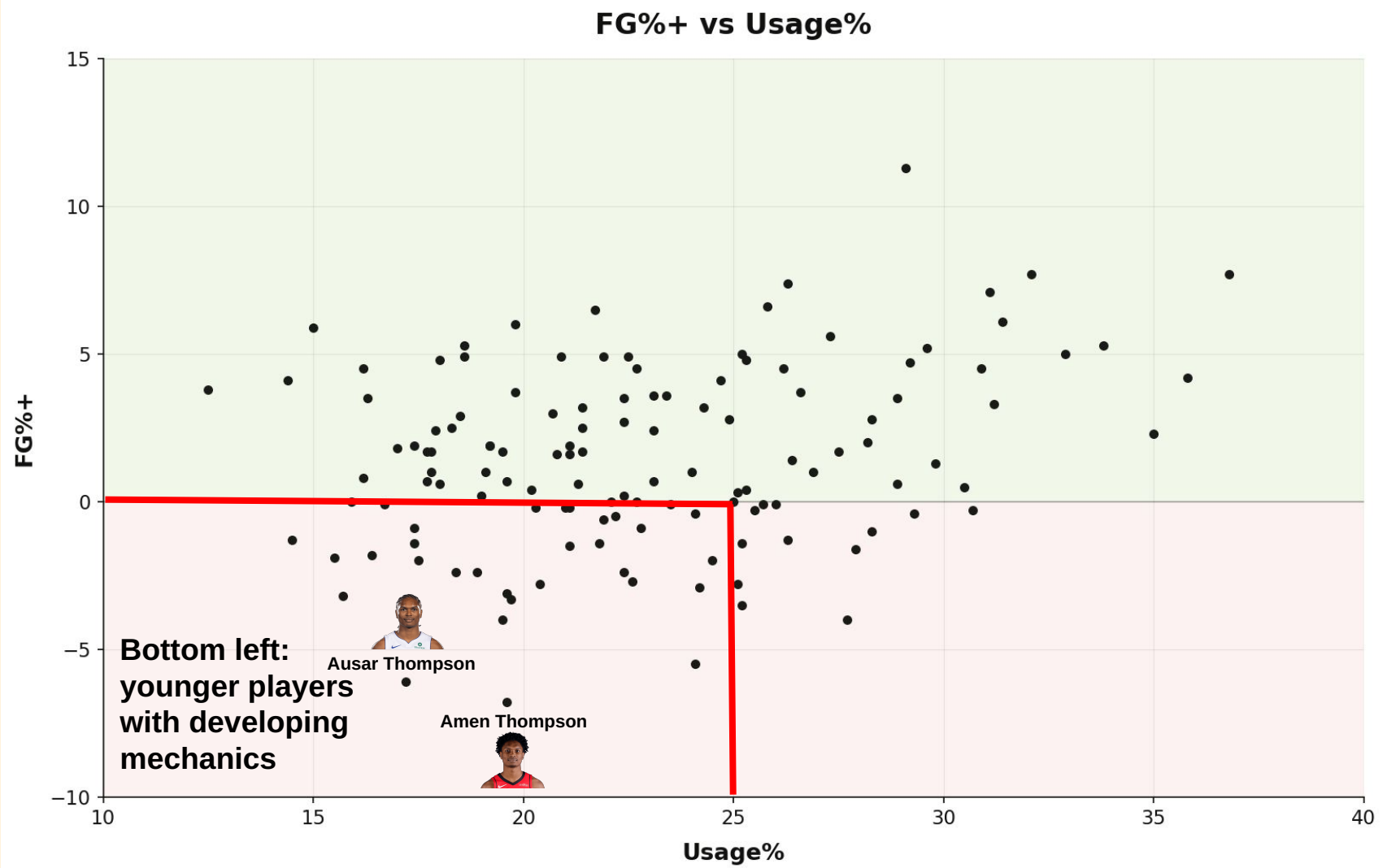
FG%+ vs Usage%
FG%+
Usage%
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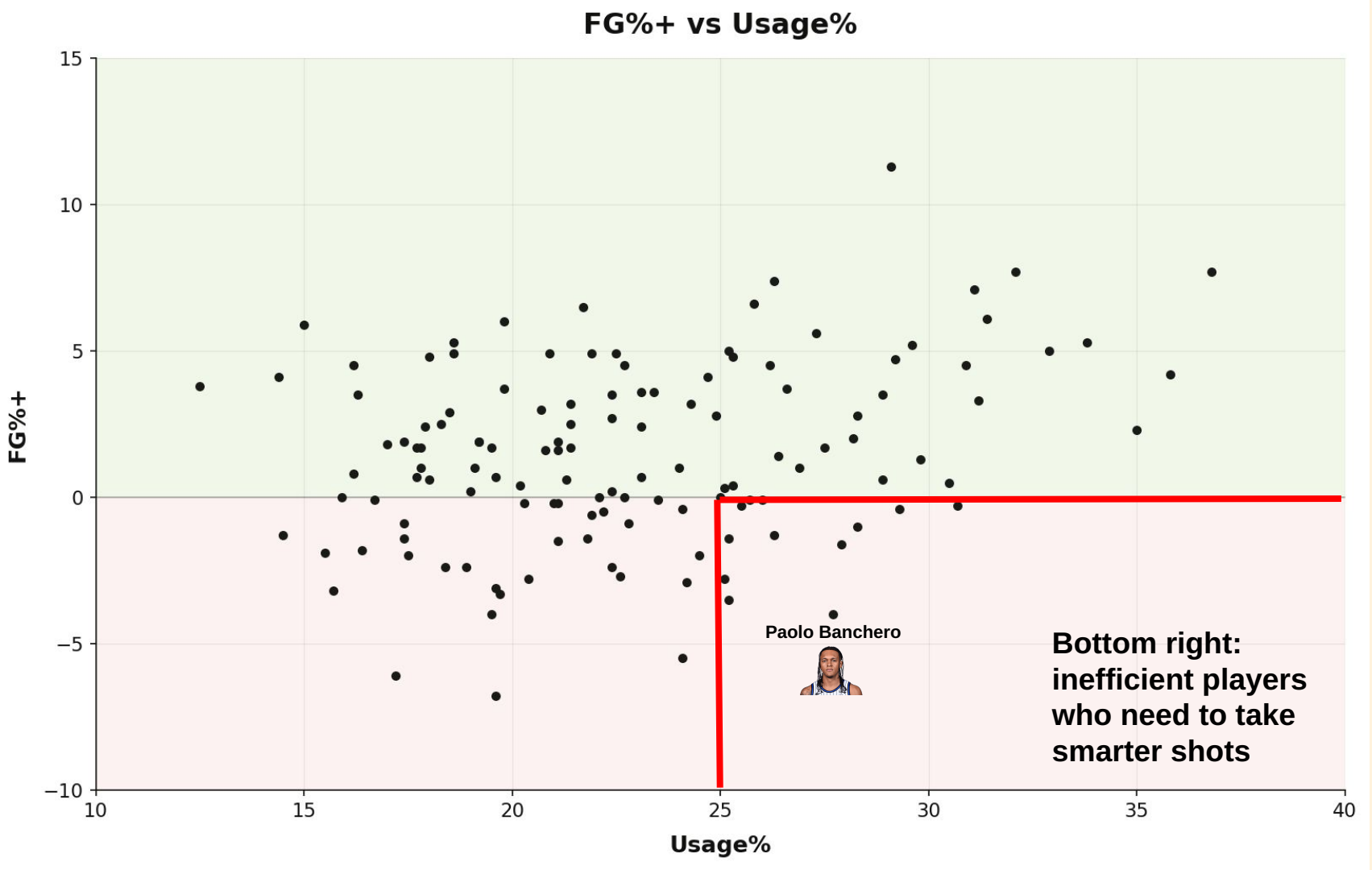
Bottom left:
younger players
with developing
mechanics
Ausar Thompson
Amen Thompson


FG%+ vs Usage%
15
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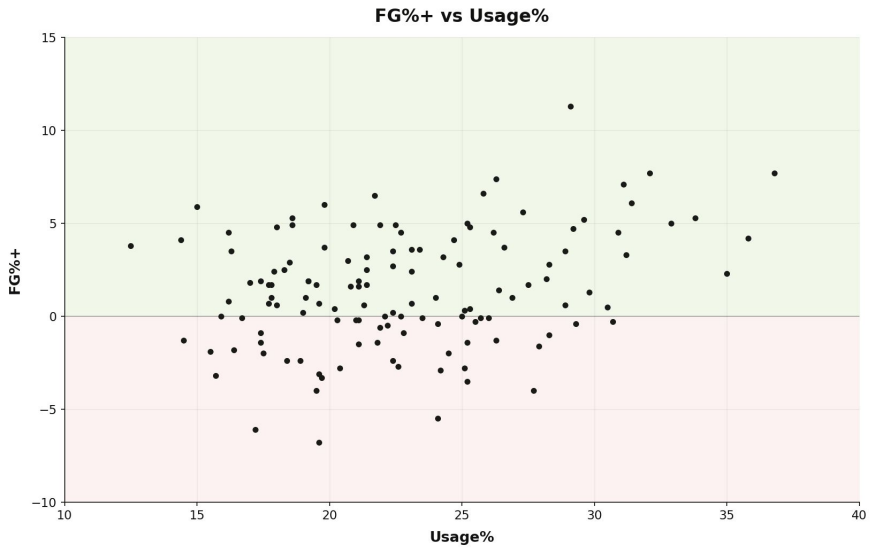
FG%+
10
15
20
25
30
35
40
Usage%
Paolo Banchero
Bottom right: inefficient players who need to take smarter shots

FG%+ vs. Usage% Correlations

- Very weak negative correlation between usage% and fg%+ → offensive responsibility does not play a large role in determining shooting efficiency
  - r = -0.17, R^2 = 0.03
- Factors that may actually determine efficiency:
  - Player experience
  - Shot selection
  - Individual role



Implications: FG%+

Positive Regression Candidate Traits:

- Historically good shotmakers currently on bad offenses
- Players who shoot good quality shots on low percentages

Negative Regression Candidate Traits:

- Aging Players
- Players losing rim pressure
- On teams with elite playmakers

Specific Player Examples: Positive Regression

Tyrese Haliburton

Efficient shotmaking last season

Darius Garland

Good shooter, good mechanics. Currently in shooting slump

Jordan Poole

Historically good shooter. Bouncing around on bad teams

Specific Player Examples: Negative Regression

Julius Randle

Streaky, with volatile 3pt shooting

Klay Thompson

High shot difficulty. On the move three specialist

Demar Derozan

Aging with decreasing efficiency. Mid range shot takes up large portion of shot selection

Predictions: Positive Regression

Trae Young

High level of self creation, about to step into a bigger role with a young core of shotmakers.

Jamal Murray

“Playoff Jamal,” will expect to see significant jump in statistical numbers throughout playoffs.

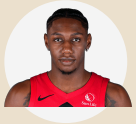
Mikal Bridges

Expanded rotation minutes/role late in the season. Historically efficient.

Predictions: Negative Regression

Jordan Clarkson

High difficulty shots, aging, historically not reliable.



RJ Barrett

Historically a high volume, inefficient scorer.

Practicality

1

Offensive Analysis

Teams can apply this statistical view to current offenses to see if they're generating good looks, regardless of success. May KEEP or CHANGE offenses based off analysis.

2

Development

Can expose fake good efficiency numbers. Or, on the contrary, encourage players in a shooting slump if the numbers back up their shot diet.

3

Talent Acquisition

"Hidden Value" vs "Inflated Numbers." Combine with offensive analysis for a rebuilding team to find the right pieces.

X

Limitations

Only a single dimension of offensive potential. Does not account for defenses faced. Clutchness and consistent elite shotmaking exists and is hard to quantify.

Ask us anything!