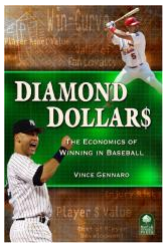

SABR—Diamond Dollars Case Competition

Optimizing Hitter Value Across Game States

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Diamond Dollars Case Competition

This case was prepared by Vince Gennaro and is developed solely for the purpose of a case discussion. It contains various assumptions that are generated for illustrative purposes and is not intended to serve as a source of primary data.

Over the last decade, we've seen increasing reliance on data to inform hitter performance. Metrics tied to batted balls, swing plane, bat speed, and contact quality have allowed hitters—and teams—to make disciplined choices about how to maximize offensive value given a player's attributes. We've evolved from observational heuristics like "this guy has power when he pulls the ball" to quantifying entire classes of hitters—such as "lift-and-pull" profiles—who may not hit the ball the hardest, but generate disproportionate power by where and how they make contact.

As a result, we can now profile a hitter's expected performance over a full season. On average, here's what we expect from him. On average, here's how many runs he'll create. And on average, those runs translate into a certain number of wins.

And therein lies the problem this case is designed to explore: **games are not played in averages.** They are played in highly contextual states, where the value of outcomes can change dramatically from one plate appearance to the next.

A natural objection is that players don't create those contexts—and therefore shouldn't be expected to account for them. That's true. Players don't create context. But the question this case asks is whether hitters can *respond* to context by adjusting their objective for a given plate appearance when the game state warrants it.

Specifically, this case explores the tension between maximizing expected individual performance and maximizing the probability of a team outcome that is more likely to lead to a win.

One example of this tension arises under conditions where:

- A single run has a high probability of producing a win
- A hitter's natural approach maximizes expected run value
- That same natural approach has a lower probability of generating *exactly one run* than an alternative approach

We'll refer to this tradeoff as the **Hitter-Optimized Approach (HOA)** versus the **Win-Creation Approach (WCA)**.

- **HOA:** A hitter's default approach that maximizes season-long expected offensive value.
- **WCA:** A context-dependent adjustment that reshapes the distribution of possible outcomes to improve the team's probability of winning in that moment—even if it reduces expected individual output.

Your task is to identify **when**, **why**, and **for whom** this tradeoff is justified. This is not a question about traditional situational hitting. It is an inquiry into how different game states and hitter profiles alter the objective function for winning baseball games.

The feasibility and impact of shifting from a Hitter-Optimized Approach to a Win-Creation Approach is not uniform across hitters. Different hitter profiles have different outcome distributions and different capacity to reshape those distributions in response to context. To keep this case focused, we'll lock in on one archetype of hitters:

Power-Variance (High-K / High-HR / Low Contact)

- Natural HOA produces a fat right tail (home runs) and a substantial probability of zero-run outcomes (strikeouts, pop-ups).
- A WCA may reduce strikeout probability and overall variance, often at the cost of home run upside.
- The value of such a shift is highly state-dependent.

Profiled over the last 2 seasons combined, this generated a list of 27 players. (Note: Three hitters with unusually complete offensive profiles (Ohtani, Judge, Raleigh) were excluded, as the HOA–WCA tradeoff is less informative for players whose outcome distributions already combine elite power and contact)

Although these hitters share a broad power-variance profile, they differ meaningfully in distribution shape and adjustability—differences that are central to this case. Below are the 27 hitters that comprise the case cohort (in no particular order):

- Oneil Cruz
- James Wood
- Ryan McMahon
- Riley Greene
- Eugenio Suarez
- Elly De La Cruz
- Kyle Schwarber
- Jo Adell
- Teoscar Hernandez
- Spencer Torkelson
- Lawrence Butler
- Randy Arozarena
- Adolis Garcia
- Jazz Chisholm Jr.
- Christian Walker
- Michael Busch
- Willy Adames
- Taylor Ward
- Rafael Devers
- Brent Rooker
- Zach Neto
- Matt Olson
- Marcell Ozuna
- Ian Happ
- Pete Crow-Armstrong
- Pete Alonso
- Shea Langeliers

Case Expectations and Scope

Your task is to identify the **game conditions** in **which hitters within the defined Power-Variance cohort**, should reasonably consider **sacrificing a Hitter-Optimized Approach in favor of a Win-Creation Approach.**

You are not being asked to prescribe a single rule or universal strategy. Instead, strong submissions will:

- Define the **conditions under which the probability of creating exactly one run outweighs the value of maximizing expected individual output**
- Identify **which hitters within the Power-Variance cohort** are most likely to benefit from such a shift in those states
- Explain **why** the tradeoff is justified in those moments, using distributional reasoning rather than averages
- Distinguish between states where a WCA is value-enhancing and those where maintaining HOA remains optimal

This case is not asking whether hitters *can* change their approach, but **when they should**, given the objective of winning the game. Hitters should change *when the state warrants it and when there is evidence that the hitter has the capacity to execute the change*. Evidence of such capacity may include observed changes in contact profile, batted-ball distribution, approach variation by count or state, or other indicators of adjustability.

This case rewards clarity of framing over false precision, thoughtful definition of game states, careful reasoning about tradeoffs, and an understanding of how individual decisions interact with team-level objectives.

Case Deliverables

Your output for this case assignment should be in the form of a powerpoint presentation to support a 20-minute oral presentation to a panel of judges, followed by a 10-minute Q & A by the judges. The judges' evaluation will emphasize the quality of your reasoning, the coherence of your analytical framework, and the clarity with which you define and address the problem—more than any single "right" answer. The ideal analysis has a logical flow, and is inclusive of the key factors that address the case question. More specifically, there are several key areas that will be a focus for the judges:

The presentation should include:

- **Your process**—a clear definition of the methodology used in developing your analysis and recommendations, including:
    - Is there solid logic that supports your approach?
    - The criteria you used to evaluate the data and draw conclusions
    - The statistical tools and techniques you employed, and why they were appropriate for the question you were asking

    - Your assessment of the risks associated with your approach
- **Your conclusions**—Does your analysis support your conclusions? You should also include the limitations of your analysis and acknowledge any risk factors.
- **Your creativity**—while you will not have time to go into detail on all of your analysis, did you think "outside the box" in how you framed the problem, defined the relevant states, or articulated tradeoffs—and did you present your findings in a clear and compelling way.
- **The quality and clarity of your presentation**—it's critical to carefully and strategically choose *what* to present and share with the judges. Storytelling is a critical aspect of influencing decisions through analytics.

Strong submissions will demonstrate an ability to reason about conditional value, tradeoffs, and decision-making under constraint, rather than relying solely on aggregate averages or one-size-fits-all conclusions.

A final comment regarding "rules" of the case and the competition:

- The intent of the competition is that team members are competing against other team members. This means that assistance from professors or non-members of the team is not permitted. Also, do not contact any MLB team or league personnel, or any other experts on non-experts, for advice on any of the case issues.
- You are encouraged to use the internet to help you with the case, particularly as a source of data, but be prepared to add your own insights, including quantitative analysis to the material you choose to draw from on the internet. One of the most common pitfalls for Case Competition participants is the over-reliance on analysis published on the leading analytical websites. While it is often valuable to consider these analyses, student teams have lost points by relying solely on these sites for answers to key case questions. We are looking to understand *your* analyses of the case questions, without an over-reliance on other peoples' thinking.

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