

ECON30580 Economics of Betting Markets

7.The Book Balancing Myth

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Fixed-Odds Betting

- Betting with bookmakers is often called **fixed-odds betting**.
- When you place a bet, your odds are fixed for that bet.
- If your pick wins, the payout is determined by the odds you took, not by how many other people picked that bet (which is how pari-mutuel odds work).
- The odds may move over time, but once you place your bet, they do not change afterwards.
- You will sometimes see claims that the “fixed odds” terminology is because bookmakers set the odds days in advance and never change them. That was never true and it really not true these days.

How Bookmakers Set Odds: Our Pricing Rule

- Remember what I said about how bookmakers set their odds.
- They begin by estimating the probability that a bet will win.
- They then build a profit margin into the price.
- So odds are set as:

$$D = \frac{1 - m}{p}$$

- p = bookmaker's estimate of the probability the bet wins
- m = profit margin

An Alternative Approach: Book Balancing

- Here's another way you could run a bookmaking business.
 - ▶ You run a book on a tennis match.
 - ▶ You take in €800 in bets on the Sabalenka and €200 in bets on Radacanu.
 - ▶ You set your odds by deciding to pay out €950 on the winner—so you are offering $D = \frac{950}{800} = 1.1875$ on Sabalenka and $D = \frac{950}{200} = 4.75$ on Radacanu.
 - ▶ You make a certain profit of €50, just like if you were running a pari-mutuel betting pool. Indeed, these are the pari-mutuel odds.
- In practice, achieving this may be tricky. New bets will keep coming in at your posted prices which will unbalance your books again.
- And unlike a pari-mutuel operator, you can't go back and change the offers you have already made to previous bettors.
- But the idea would be that if new bets came in on Sabalenka, you would reduce her odds and increase the odds on Raducanu for new bettors, to try to “re-balance” the books to get closer to the no-risk profit.

What Google, Reddit and Wikipedia Say

Google AI Summary (“How do bookmakers set odds?”)

Bookmakers tweak the lines ... to balance their books and ensure profit regardless of the result. They aim to create a “fair book” where they take in balanced money on all sides, making money from the commission, not just picking winners.

Top answer on Reddit

They don't care about the outcome. Their goal is to find odds that result in an equal amount of money being bet on both sides. They tweak the payouts so that no matter the outcome, one side is paid out less than the other side bet leaving them a profit.

Wikipedia: Mathematics of bookmaking

A bookmaker strives to accept bets on the outcome of an event in the right proportions in order to make a profit regardless of which outcome prevails.

What Academics Say

- One of the first academic papers on fixed-odds bookmakers was a 1967 paper called “Market Efficiency and Football Betting,” by Lyn Pankoff. He described bookmakers as follows:

“As a rule, the bookmaker’s role is primarily that of broker. His income is derived from keeping a percentage of all winning bets. To avoid a lopsided book, he may first try to get other bookmakers to cover some of his bets . . . To the extent that they succeed in this effort, they maintain their status as brokers and non-risk-takers.”

- Linda Woodland and Bill Woodland were researchers who published some high-profile papers on betting markets. In a 1994 paper in the prestigious *Journal of Finance* they pronounced:

“The bookie has no desire to participate as an active gambler. Rather, he establishes a line or price to balance the wagers so that his commission is independent of the final outcome of the contest.”

- A recent high-profile paper on sports betting also says:

“On average, bookmakers generally set lines such that they take no risk.”

Two Very Different Views of Odds Setting

- The pricing rule

$$D = \frac{1 - m}{p}$$

implies that bookmakers:

- ▶ Estimate probabilities
 - ▶ Accept risk on individual events
 - ▶ And earn profits on average across many bets
- The book-balancing story implies that bookmakers:
 - ▶ Do not rely on probability estimates
 - ▶ Mechanically adjust odds to control exposure
 - ▶ And aim to eliminate risk on each event

The Book Balancing Theory is Completely Wrong

- There is serious authority behind the book-balancing theory
 - ▶ Google.
 - ▶ Reddit.
 - ▶ Wikipedia.
 - ▶ Decades of academic papers.
- They can't all be wrong, can they?
- Yep, they can. This theory of fixed-odds bookmaking **is completely wrong**.
- I will point to 3 reasons why we should not believe this theory.
 - 1 Bookmakers clearly state that they don't do this.
 - 2 The evidence we have on betting volumes shows that they don't do this.
 - 3 Economic theory provides us with no good reason for this to be the optimal approach.
- Let's take each of these in turn.

What Bookmakers Say

- Jay Kornegay is the most famous bookmaker in Las Vegas.
- Here's what he told Rob Miecch, the author of *Sports Betting for Winners* (which by the way does not in any way teach you how to be a winner ...)
- *"I think there's a little urban legend that's out there, that we just want to balance every game. In a perfect world, yeah. But in a perfect world, it just doesn't happen. You go through every single game today and probably none of them ... are balanced on both sides. That scenario right there, it just doesn't happen. I don't want to sound corny but it is somewhat of an art form. You're dissecting the money, you're dissecting the market, you're dissecting the betting patterns that we're seeing between the sharps and the general public. What we're trying to do is put ourselves in the best possible position to win, not necessarily balancing both sides."*
- Other books on sports betting regularly tell stories about specific sporting events where bookmakers lost enormous amounts of money because their books were so unbalanced and the "wrong" contestant won.

Evidence on Betting Volumes

- Betting odds are publicly available and have been often used in research by economists.
- But bookmakers tend not to publish the volumes of bets that they take on different contestants.
- However, there are still some sources that have given us information on bookmakers' volumes as well as prices for specific cases.

Two Older Studies

1 Levitt (2004).

- ▶ This paper examined data on about 20,000 spread bets placed NFL games as part of an online “contest” (advertised as such to get around gambling bans).
- ▶ He found *“the bookmaker does not appear to be trying to set prices to equalise the amount of money bet on either side of a wager. In almost one half of all games, at least two-thirds of the bets fall on one side of the gamble.”*
- ▶ Levitt concluded that the bookmaker in his study was setting odds to maximise profits rather than minimise risk.

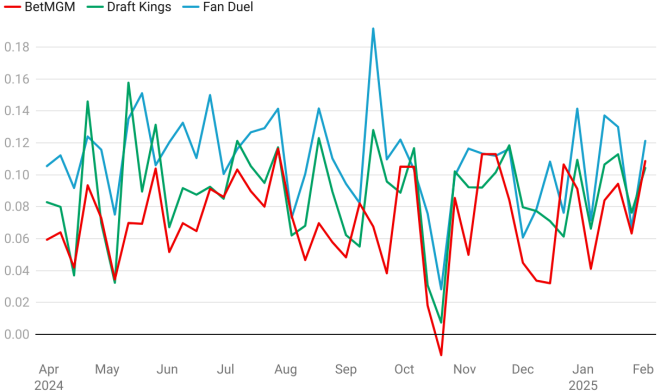
2 Strumpf (2003)

- ▶ Strumpf obtained data on the operations of illegal bookmakers from documents made available by the Brooklyn District Attorney’s office when the bookmakers were prosecuted.
- ▶ *“I find that bookmakers gamble and take positions on games. The resulting variation in net revenues is substantial, with one large bookmaker winning or losing one hundred thousand dollars per day on a daily bet volume of half a million dollars.”*

Weekly Profit Margins in New York State

- US state governments require the legalised sportsbooks to publish data on their total volume of bets taken (which they call “wagering handle”) and their gross pre-tax profits (which they call “gross gambling revenue”).
- I collected weekly data for the last year for the 3 biggest sportsbooks in New York State: Fan Duel, Draft Kings and BetMGM.
- If these are “book balancing” bookmakers taking very little risk, then we would expect to see a steady profit rate on bets taken.
- But that’s not what we see. The weekly ratio of gross profits to betting volume taken is highly volatile.
- The gross profit rates are clearly correlated – some weeks the results work out better for the bookmakers than others.
- And, occasionally, you see bookmakers reporting that they lost money on their betting activities.
- BetMGM lost money on its New York betting for one week in October 2024.

New York State Gross Profit Margins for 3 Sports Books



Created with Datawrapper

The Over-Under Bet in Soccer

- 2.5 goals is about the average number of goals in professional soccer games.
- A popular market is to bet on the number of goals in a game being either under or over 2.5.
- Some matches seem more likely to be high scoring than others, so the bookmakers adjust the odds for each game.
- A 2016 study by Flepp, Nuesch and Frank used data supplied by a German bookmaker on both odds and volumes in this market.
- They found that about 80% of betting volume is placed on the over bet. See the right chart on the next page.
- This makes sense: It's not much fun watching a match hoping nobody scores.
- But they did not find any odds adjustment aimed at discouraging over bets and encouraging under bets. Average returns to both kinds of bets are equal.
- So bookmakers take on large amounts of risk every time they offer over-under bets. If the over wins, they lose money and if the under wins, they make a profit.

Prices (meaning inverse decimal odds) and Volumes for Over-Under Bets

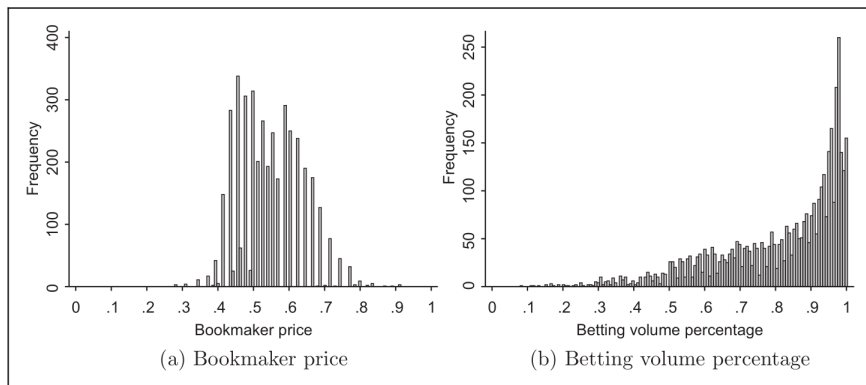
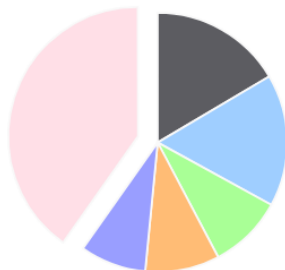
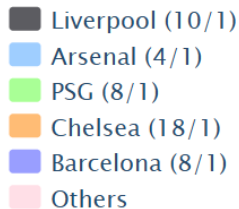


Figure I. Distribution of bookmaker prices and betting volume percentages from over bets.

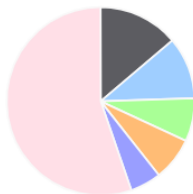
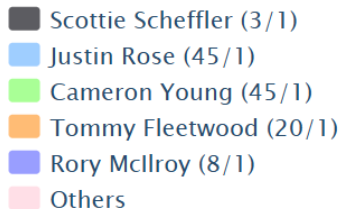
Oddschecker Data on Bet Popularity

- The Oddschecker website publishes information on the popularity of different bets.
- See the next few pages.
- You can see that there is no relationship such that the favourite is the most popular bet or that very few people bet on outsiders.
- Some examples
 - ▶ Liverpool are fourth favourites to win the Champions League but are a more popular bet than the three biggest favourites.
 - ▶ There is more money on Justin Rose to win at 45/1 than Rory McIlroy at 8/1. are the joint most popular bets to win the Masters, despite Scheffler being the favourite and having much lower odds. Third favourite Bryson DeChambeau (16/1) is not amongst the 5 most popular bets.
 - ▶ Wales at 200/1 were a more popular bet to win the Six Nations before it started than Ireland at 15/2.
 - ▶ There is way more money on Northampton at 25/1 to win the rugby Europeans Champions Cup than favourites Leinster at 11/4.

Champions League Odds and Bet Popularity Prior to Playoffs for Last 16 Places



Odds and Bet Popularity for the Masters Golf Tournament



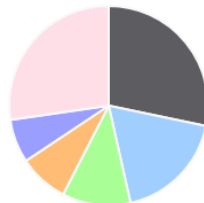
Pre-Tournament Odds and Bet Popularity for the 2026 Six Nations

Most Popular Bets

- France (7/4)
- Scotland (17/2)
- Wales (80/1)
- Ireland (2/1)
- England (9/2)
- Others



Odds and Bet Popularity for the 2026 European Champions Cup



Theoretical Arguments

- Bookmaking companies are firms.
- We usually assume firms seek to maximise profits, not minimise risk.
- We have no reason to believe that “volume balancing odds” are equal to profit-maximising odds (and I can show later that they are not).
- It may be the case that some bookmakers do worry about risk.
- But we have a huge field in economics that focuses heavily on how people trade off risk and return and it does not predict that people should ignore return to just focus on minimising risk.
- So while the book-balancing no-risk model of the bookmaker seems to appeal to people as a natural starting assumption, this is not the way the industry works.

Supplementary Material in the Draft Book

- Chapter 10: The Balanced Book Myth