

ECON30580 Economics of Betting Markets

Introduction

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Welcome!

- Welcome to ECON30580: Economics of Betting Markets.
- To my knowledge, it is one of only two university modules in the world on the Economics of Betting Markets.
- I hope to convince you that it is a fun and interesting topic and other universities are wrong in not offering this option!
- My career has mainly focused on macroeconomics but, a few years ago, I wrote a paper about how betting markets responded to the absence of fans at soccer matches during Covid with Tadgh Hegarty, an economics PhD student at UCD. Dr. Hegarty (as he is now) is a talented economist who has also worked as a bookmaker.
- I learned lots of things from Tadgh about sports betting markets and began writing research papers with him about how these markets work.
- One of the things we try to do with Level 3 modules is to give students an idea about how economists conduct research. I hope you will learn a bit about this process from our discussions and from reading some of my papers.

Part I

How The Module Works

Technical Requirements

This module covers some fun and interesting topics. But that does not mean it will be easy.

- The module will require people to have quantitative skills—for example, to be comfortable manipulating a set of numbers provided for betting odds to calculate implied probabilities.
- It also requires either a good preparation in **microeconomics** or an ability to get up to speed very quickly. We will discuss concepts such as expected utility maximisation, profit maximisation and different microeconomic market structures (competition versus monopoly versus oligopoly) and their pricing rules.
- We use **algebra (including calculus)** to solve for probabilities and bookmakers' margins and to derive optimal decisions for bettors and bookmakers.
- We will use **statistical methods** such as deriving variances for payoffs on bets, using cumulative probability distributions and properties of random walks.
- It will not be possible to get a high grade without using algebra in the final exam.

Warning for Bluffers!

- You may come into the module thinking you already know quite a lot about this topic, perhaps because you are interested in sports or do some betting.
- If you think that, I am pretty sure you are completely wrong.
- Not only do you probably not know that much about the topic but a lot of what people think they know about it (for example about how bookmakers behave) is incorrect.
- This idea that this is an easy topic that you already understand leads some people to show up at the final exam imagining they can bluff their way through the answers without having studied the course material.
- This strategy will almost certainly cause you to fail the exam.

Course Materials

- The primary course materials will be my lecture notes, available as PDF files on Brightspace. They will be posted at least one week prior to the lectures.
- Supplementary reading will be made available in the form of chapters from my draft book, *Fine Margins: How Economics Explains Sports Betting*. The book is intended for a more general audience than economics majors and it does not replace the technical material required for assessments.
- **The assessments are based on what is in the lecture notes.** If you see something in the book chapters that is not in the notes, it will not be covered in the assessment. Similarly, something that is in the notes but not the book is very much potentially assessable.
- So the book is not compulsory reading, just a potentially helpful supplement.
- I will make some research papers available in Brightspace. You don't have to read them but they can help with providing a more comprehensive coverage of some of the issues that will be covered in the final exam.

About the Book

- The draft chapters are unpublished and remain under strict copyright.
- Circulation or digital distribution of the chapters is strictly prohibited.
- Specifically, uploading this material to public websites or “study-help” repositories is a violation of copyright law and will be treated as a breach of academic integrity.
- I will open an anonymised survey about the book in Brightspace.
- It just asks you to provide feedback about the book in a text box.
- The book is intended for a general economics-curious and betting-curious audience. Any constructive feedback would be greatly appreciated :-)

Assessment

Your final grade will be based on two components.

- 1 **Assignment (30%):** I will release the questions for the assignment gradually over the first few weeks. This can allow you to complete them once we have covered them in class rather than waiting until the last question has been posted. The assignment is to be submitted on Brightspace and will be due at 11.30pm on Wednesday March 25, i.e. the day of the first lecture after the two-week break.
- 2 **Final Exam (70%):** This will be an in-person final exam during the exam period. The exam will have two sections:
 - ▶ Section 1 (60 points): This will have a choice of different short discussion questions. You will be asked to answer 6 questions from 12 provided.
 - ▶ Section 2 (40 points): This section will contain more technical questions based on various models that we will cover.
 - ▶ **The questions on the final exam will come from lists of questions that I will provide that will build up over term. Yes, you read that right. All questions on the exam will be from the lists that you have seen.**

On AI

For the assignment:

- The assignment requires you to submit a unique set of answers so generic answers from AI are unlikely to score well.
- The language that various AI tools use to answer these questions will be very similar. Remember that I can also ask AI to answer them and I can tell if your answers look like generic AI-generated answers.

For the exam, I know many of you think AI is of great help when preparing for exams but my experience is performance in exams is worsening in recent years.

- A better strategy than relying on AI-prepared answers will be to (a) Come to class to hear me emphasise what I think are the key points (b) Use the lecture notes and book chapters.
- Just typing the questions that I provide into an AI chatbot will produce answers that will score badly if you repeat them in the exam. The exam is a test of the material covered in this module, not what AI picks up from scanning the internet.

Contacting Me

- **Email:** You can reach me at karl.whelan@ucd.ie. If I don't reply within 24 hours, just send your email on again (I won't mind).
- **Office Hours:** I will hold weekly office hours via Zoom on Fridays between 12.30pm and 1.30pm. The link to these office hours is available in Brightspace.
- **Meeting in Person:** Let me know if you would prefer to meet in person at my office and we can set up a meeting. I will of course also be happy to talk with students after class.
- **In Class:** I am very happy to take questions in class. I have received some excellent questions in recent years from people who stopped me to ask a question.

Part II

What The Module Is About

Things This Module Is Not About

What this module is not about

- 1 It is not about sports or the economics of sports.
- 2 It is not about how to win at betting. If I had a system for beating bookmakers, would I be teaching this rather than hanging out on my super-yacht? And why would I be sharing this system with you?
- 3 That said, I will teach some things about how to lose less when betting. No “get rich quick” advice but perhaps some “get poorer more slowly” advice.

My Advice on Betting

Do not bet on sports or risk money in “investments” that, on average, have a negative return for participants.

What This Module Is About

Economics is at its most fun and useful when we use it to understand things happening in the world around us that are not so clear otherwise. We will use economics to understand

- How betting odds reflect available information and when and how they can be used to estimate probabilities of various events.
- How people take decisions involving risk.
- How different betting market structures produce different outcomes.
- How (and why) average loss rates vary across different kinds of bets.
- Why bookmakers promote specials and accumulators and seem so generous with “free bets”.
- How much to bet if you have a genuine advantage over bookmakers. (Trust me, you don't ... but it's an interesting topic.)
- Understanding betting exchanges and prediction markets on non-sports events.
- Negative effects of gambling and debates around taxation and regulation.

Betting: A Challenge for Economists?

- Betting is a popular activity and it is growing around the world.
- But it seems to pose a problem for standard economic theories. On average bettors lose money and people are usually risk averse.
- **So why do people place bets? Why does this industry even exist?**
- My approach to this question is to explain how conventional expected utility models can do well at explaining the behaviour of bettors once we factor in that people disagree about the probabilities of various outcomes occurring.
- I will also show how conventional microeconomic theory also does pretty well at explaining the other side of the market—how bookmakers behave.
- One particularly negative aspect of betting is that some people become addicted to it and this addiction has very negative impacts.
- The models we cover in most of the course will not feature people who behave in this fashion but it is an important topic so at the end we will also discuss how to use economic theory to model this kind of behaviour.

Evidence

- Theories are of limited use without data to test them.
- And one of the great things about this topic is it generates loads of data and plenty of interesting puzzles.
- So we won't just be developing theories, we will also be looking at the evidence on betting markets to see whether the theories help us understand them.
- Along the way, we will look at evidence from huge datasets of odds and results for different sports as well as other examples such as data from prediction markets.
- You will be asked to go get your own data both for a specific event and also get a bigger dataset and use the tools taught in our first few weeks to interpret these data.

Detailed Plan (Mostly One Lecture Each)

1. Introduction
2. The past and present of betting markets
3. Basics of betting markets: Odds, win rates, expected payouts and margins
4. Risk-taking and utility in gambling
5. Pari-mutuel betting and the favourite-longshot bias
6. Disagreement and pari-mutuel betting
7. Introduction to fixed-odds betting markets
8. Market structure and information in fixed-odds betting markets
9. A monopolistic model of fixed-odds betting markets
10. Oligopoly in fixed-odds betting markets
11. Evidence and case studies:
 - (a) Favourite-longshot bias
 - (b) Spread bets versus bets on who wins
 - (c) Returns to betting on draws
 - (d) Corruption and inside information
 - (e) Betting with big fields
 - (f) Margins across different markets
 - (g) Specials and multi-leg bets
 - (h) In-play betting and cash out
 - (i) Free bets
12. Asian handicap betting on soccer
13. Betting exchanges and prediction markets
14. Ruin, risk aversion and the Kelly criterion
15. Social impacts of gambling and questions about regulation and taxation.