The Magic of the Game: Experimental Evidence on Sports Betting Behavior

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A global concern

- Sports betting is a fast-growing industry with a global turnover of more than 70 billion USD
  - In the US, 60 million people bet regularly on sports (FSGA, 2022)
- The phenomenon is **booming, including among poorer populations**
  - Financial constraints may fuel rather than discourage betting if it is perceived as an opportunity to cover 'lumpy' expenditures (Herskowitz, 2021)
  - Anecdotal evidence that sports betting may be perceived as an income generating activity
- Growing policy concerns about **over-betting**

Why do people gamble?

Agents are willing to participate in (typically unfair) lotteries because:

- **Rational** explanations:
  - They are risk-loving, or derive enjoyment from gambling
  - They have a preference for return skewness or seek the chance of life-changing winnings
- **Biases** in decision-making and biased learning from experience:
  - Upwardly distorted beliefs, myopic decision-making
  - Selective recall of past events.
  - These biases are challenging to address through information-based interventions

What about sports betting?

- Sports betting involves predicting the outcome of sports events
- Bettors' predictive abilities – and their *perception* of these abilities – play a crucial role
- These predictions are often found to be biased:
  - Toward the supported team (Donkor et al., 2023), the favorite team (Levitt, 2004), underdogs (Snowberg and Wolfers, 2010), or past winners (the "hot hand fallacy")
  - Bookmakers often exploit these biases to make profits
- *How do bettors value sports bets and form expectations about winning probabilities?*
  - Valuation premium attached to sports betting?
  - Systematic biases in gamblers' expectations?

What we do

- A lab-in-the-field experiment with regular sports gamblers in urban Tanzania
- Participants bet on a UK Premier League game or a neutrally framed (urn-and-balls) lottery with identical odds
- We identify the impact of the sports framing on subjective expectations of winning and certainty equivalents
- We test a randomized information treatment to improve bettors' understanding of winning probabilities
- We complement the experimental results with a rich picture of betting behavior

What we find

- Sports bets are **valued more** than equivalent *neutral lotteries*
- Subjective winning probabilities are **higher** under the sports framing
- Subjects actually **lose** the same amount, on average, in both types of lotteries
- Most betters are men with low education, bet very frequently, and are motivated by need
- Providing information to explain the odds does not affect perceptions much

Outline

Experimental design I

- Participants receive an endowment of 10,000 TSh (approx. 4.30 USD, a day's median wage)
- They are randomly assigned to one of two lottery types: Sport, Neutral
- Sport: Bet the endowment on one outcome of a UK Premier League match (1, X, 2) to be played the same evening
- Neutral: Bet on the color of a ball to be drawn from an urn
- Same odds in both from real betting companies; all payments occur in the evening after the football match

▸ Matches

Experimental design II

Additional treatments/subgroups:

- **No Choice subgroup**: subjects receive the ticket of a pre-fixed bet rather than choosing their bets
  - Deals with endogeneity of the chosen outcome
- **Information treatment** explaining (implied) probabilities to a subgroup of subjects facing the sports lottery
  - An approach used by gambling authorities in a range of countries.

Table: Summary of Experimental Groups

	Sports-betting		**Neutral lottery**
	Info treatment	No info treatment	
Choice	Bet on a Premier League game. Information treatment.	Bet on a Premier League game.	Bet on outcome of an urn-and-balls lottery
No choice	Ticket for an already-placed Premier League game bet. Information treatment	Ticket for an already-placed Premier League game bet	Ticket for an already-placed urn-and-balls lottery bet

Subjective Probabilities and Certainty Equivalents

- **Eliciting Subjective Probabilities**. After bet is placed/given, we ask subjects what is the probability that each outcome will occur
- **Eliciting Certainty Equivalents.** After bet is placed/given, we offer subjects to exchange their ticket for an increasing amount with certainty
  - to be paid in the evening

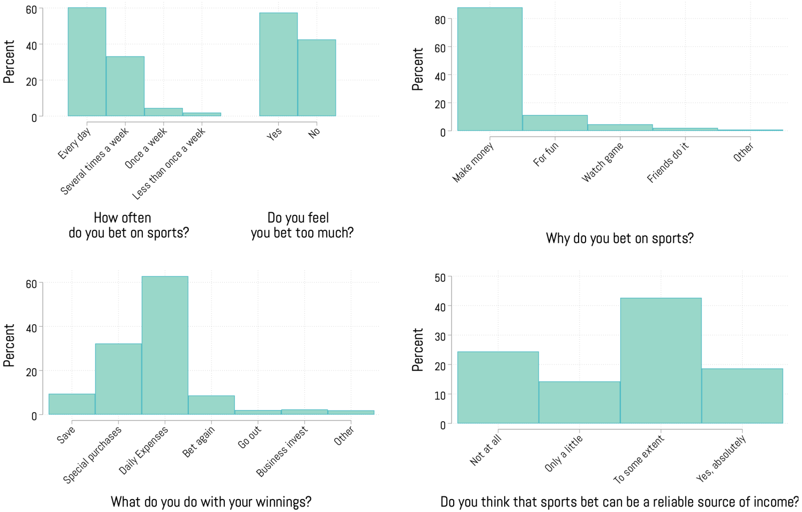
Outline

Our sample

- 729 regular bettors in Dar es Salaam
- Sampled outside betting stores belonging to mainstream betting companies
- Three out of the five districts of Dar es Salaam (Ilala, Kinondoni, and Ubungo)
  - Diverse areas in terms of economic activity (residential vs. commercial), and income levels (low, middle, high)

Sum. stats & balance

Stylised facts on betting habits from our survey I



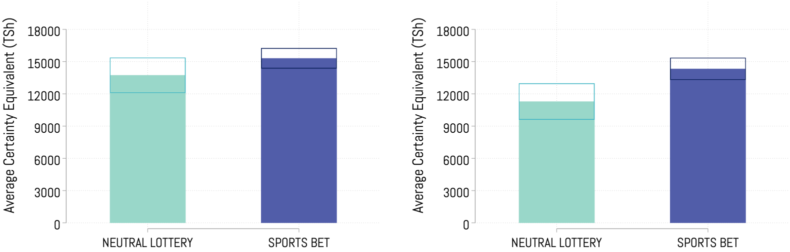
Stylised facts on betting habits from our survey II

- They spend a significant share of income on betting (half of the sample spend at least TSh 20,000, 15% of median monthly earnings)
- Median reported net winnings (past two weeks) are 0
- Three-quarters consider themselves football experts

Outline

Sports betting induces higher certainty equivalents

Figure: Certainty Equivalents



(a) Choice arm **(b)** No-Choice arm

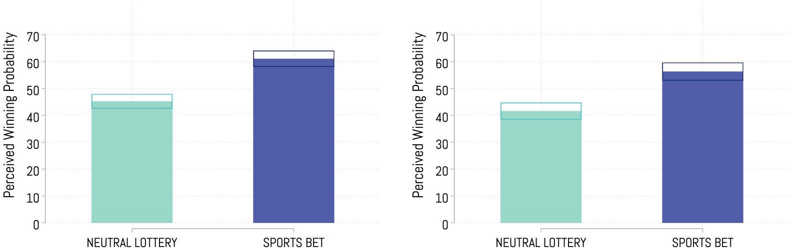
Sports betting induces higher certainty equivalents

Table: Certainty Equivalents

	Choice		No choice		Choice conditional		All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	Tobit	OLS	Tobit	OLS	OLS	OLS
Sports Bet	1709.02*	3138.63	2896.01***	5438.03***	2629.32**	2484.55**	3136.79***
	(978.13)	(1966.62)	(1019.07)	(1828.52)	(1087.83)	(1045.22)	(1008.02)
Choice Arm							2463.21**
							(1201.20)
Sports Bet × Choice Arm							-1467.32
							(1395.55)
Day-by-outcome FE	No	No	No	No	Yes	No	No
Control for objective probability	No	No	No	No	No	Yes	No
Mean dep. var (Neutral Lottery)	13666.67	13666.67	11285.71	11285.71	13666.67	13666.67	11285.71
Std. dev. dep. var	8443.56	8443.56	8418.19	8418.19	8443.56	8443.56	8418.19
Observations	325	325	319	319	325	325	644
R-squared	0.048		0.070		0.089	0.037	0.053

Sports betting induces higher expectations of winning

Figure: Perceived probability of winning



(a) Choice arm **(b)** No-choice arm

Sports betting induces higher expectations of winning

Table: Perceived probability of winning

	Choice	No choice	Choice conditional		All
	(1)	(2)	(3)	(4)	(5)
Sports Bet	15.58***	14.29***	10.89***	10.97***	14.34***
	(2.16)	(2.27)	(2.54)	(2.38)	(2.27)
Choice Arm					3.73*
					(2.20)
Sports Bet × Choice Arm					1.10
					(3.12)
Day-by-outcome FE	No	No	Yes	No	No
Control for objective probability	No	No	No	Yes	No
Mean dep. var (Neutral Lottery)	45.21	41.56	45.21	45.21	41.56
Std. dev. dep. var	15.14	17.48	15.14	15.14	17.48
Observations	361	367	361	361	728
R-squared	0.140	0.158	0.201	0.176	0.133

Mechanisms

Two main potential channels:

1. Extra **utility** derived from betting on sports compared to neutrally framed lotteries:
    - valuation premium as the price to participate in an activity they enjoy
    - Examples: watching the game, betting on their favorite team...
2. Bettors consider themselves particularly capable of predicting the outcomes of sports events:
    - bettors could actually 'beat the odds'
    - ...or they **believe they can**

Mechanisms

- Little support for the utility channel
  - Those who state they bet for fun are only a minority; no evidence of higher CE for those who do
  - the share of those who bet on the favorite team ≈ the share of those who bet on their favorite color
- No support for bettors' higher predictive ability
  - On avg., bettors under the sports framing lose 588 TSh, under the neutral framing 504 TSh
  - "Football experts" and more regular bettors loose *more*
- **Overconfidence** may be the leading channel:
  - bettors have upward-biased winning expectations
  - this leads to a systematic overvaluation of sports bets

Outline

To sum up

- We provide novel evidence on **betting habits**:
  - Bettors bet frequently, allocate a significant share of their income to this activity, and view betting as a source of income (akin to a job) as opposed to a game
- We experimentally investigate **the drivers of sports betting**
  - We find that sports bets trigger higher certainty equivalents and higher subjective probability of winning
  - Bettors under the sports framing are no more likely to win
- Bettors' misperceptions on their predictive ability as the leading channel

Policy insights

- Gambling is often justified on the grounds that risk-loving individuals should be free to make a choice that gives them positive utility even if it leads to financial losses
- This argument may be partial if the expectations on which bettors' assessments are based are incorrect and/or there are obstacles to belief updating
- Our findings suggest that providing information on the odds of a bet may not be the solution to improve bettors' assessment and reduce their financial losses

Thank you!

Balance i

Table: Randomization check

Panel A: Demographics and Income	Demographic		Education				Income (TSh)			
	(1) Age	(2) >3 family	(3) None	(4) Primary	(5) Low Sec.	(6) Upp. Sec.	(7) <50k	(8) 50-200k	(9) 200-500k	(10) >500k
Neutral (Choice)	0.21	-0.04	0.03	0.05	-0.05	-0.03	0.13**	-0.03	-0.06	-0.03
	(1.15)	(0.06)	(0.02)	(0.06)	(0.06)	(0.04)	(0.06)	(0.06)	(0.05)	(0.03)
Sports (No choice; No info)	-0.97	-0.02	0.01	0.05	-0.07	0.01	0.09	-0.12*	-0.02	0.05
	(1.10)	(0.06)	(0.02)	(0.06)	(0.06)	(0.04)	(0.05)	(0.06)	(0.05)	(0.04)
Sports (Choice; No info)	-0.11	-0.02	0.02	-0.05	-0.04	0.08*	0.06	-0.07	0.04	-0.03
	(1.10)	(0.06)	(0.02)	(0.06)	(0.06)	(0.04)	(0.06)	(0.06)	(0.05)	(0.03)
Sports (No choice; Info)	-1.85*	0.08	-0.01	-0.00	-0.00	0.02	0.04	-0.08	0.06	-0.01
	(1.07)	(0.06)	(0.02)	(0.06)	(0.06)	(0.04)	(0.05)	(0.06)	(0.05)	(0.03)
Sports (Choice; Info)	-2.00*	0.08	0.01	-0.05	-0.01	0.05	0.03	-0.13**	0.04	0.06
	(1.05)	(0.06)	(0.02)	(0.06)	(0.06)	(0.04)	(0.05)	(0.06)	(0.05)	(0.04)
Mean (Neutral, no choice)	32.88	0.54	0.02	0.42	0.45	0.10	0.21	0.50	0.21	0.07
SD (Neutral, no choice)	9.09	0.50	0.16	0.50	0.50	0.30	0.41	0.50	0.41	0.26

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Table: Randomization check

Panel B: Employment and Wages	Employment		Wage				Sector			
	(1) Self emp.	(2) Unemp.	(3) Freq: Day	(4) >10k	(5) >150k	(6) >300k	(7) Agri	(8) Manuf	(9) Retail	(10) Clerical
Neutral (Choice)	0.04	-0.05	-0.00	-0.05	-0.19	0.01	0.01	0.08	-0.13**	0.02
	(0.06)	(0.04)	(0.06)	(0.08)	(0.13)	(0.12)	(0.04)	(0.06)	(0.06)	(0.04)
Sports (No choice; No info)	-0.02	-0.01	-0.08	-0.03	-0.22*	0.07	0.02	0.02	-0.02	-0.01
	(0.06)	(0.05)	(0.07)	(0.09)	(0.12)	(0.11)	(0.04)	(0.06)	(0.07)	(0.03)
Sports (Choice; No info)	0.04	-0.01	0.04	-0.10	0.04	0.22*	-0.00	-0.01	-0.08	0.00
	(0.06)	(0.05)	(0.06)	(0.08)	(0.12)	(0.13)	(0.04)	(0.06)	(0.06)	(0.04)
Sports (No choice; Info)	0.03	-0.04	-0.05	-0.10	-0.08	0.00	-0.04	0.01	-0.08	-0.01
	(0.06)	(0.04)	(0.07)	(0.09)	(0.12)	(0.11)	(0.03)	(0.06)	(0.06)	(0.03)
Sports (Choice; Info)	0.02	-0.02	0.01	-0.11	-0.16	-0.15	0.01	-0.05	-0.07	0.04
	(0.06)	(0.05)	(0.06)	(0.08)	(0.13)	(0.09)	(0.04)	(0.06)	(0.06)	(0.04)
Mean (Neutral, no choice)	0.58	0.17	0.72	0.63	0.74	0.22	0.07	0.30	0.34	0.07
SD (Neutral, no choice)	0.50	0.37	0.45	0.49	0.45	0.42	0.26	0.46	0.47	0.26

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Table: Randomization check

Panel C: Sports Betting Behavior	Perception		Frequency		Outcome			Reasons		
	(1) Expert	(2) Akin job	(3) Everyday	(4) Too much	(5) Spent	(6) Won	(7) Net	(8) Profit	(9) Fun	(10) Watch g.
Neutral (Choice)	-0.07	0.06	-0.01	0.14**	2.84	3.90	1.06	0.01	-0.02	0.02
	(0.06)	(0.06)	(0.06)	(0.06)	(9.80)	(25.63)	(26.11)	(0.04)	(0.04)	(0.03)
Sports (No choice; No info)	-0.09*	0.06	0.08	0.08	3.01	135.37	132.36	0.02	0.01	-0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(9.04)	(161.94)	(161.42)	(0.04)	(0.04)	(0.02)
Sports (Choice; No info)	0.00	-0.09	-0.08	0.03	-2.96	-13.51	-10.55	-0.03	-0.02	0.01
	(0.05)	(0.06)	(0.06)	(0.06)	(9.15)	(31.86)	(30.23)	(0.04)	(0.04)	(0.03)
Sports (No choice; Info)	-0.06	0.04	0.01	0.04	5.05	-8.10	-13.15	-0.06	0.02	0.02
	(0.05)	(0.06)	(0.06)	(0.06)	(9.74)	(26.85)	(27.34)	(0.04)	(0.04)	(0.03)
Sports (Choice; Info)	-0.03	-0.01	-0.04	0.10	28.10	3.31	-24.79	0.03	-0.02	0.00
	(0.05)	(0.06)	(0.06)	(0.06)	(33.64)	(27.64)	(42.84)	(0.04)	(0.04)	(0.03)
Mean (Neutral, no choice)	0.79	0.60	0.61	0.51	34.31	86.95	52.64	0.88	0.12	0.04
SD (Neutral, no choice)	0.41	0.49	0.49	0.50	82.03	190.81	190.50	0.32	0.32	0.20

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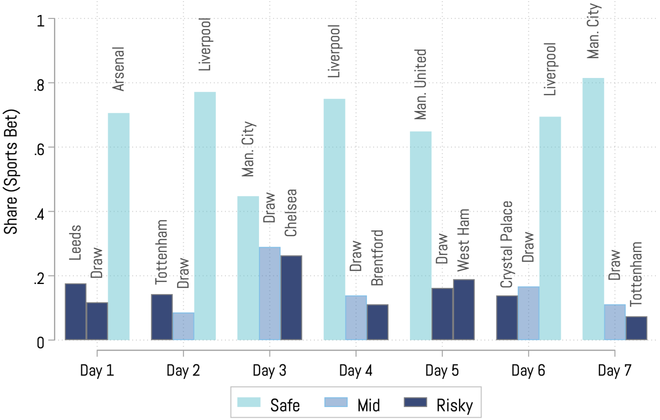
The UK Premier League Matches

Figure: Participants' betting choices



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