CSEF

Centre for Studies in Economics and Finance

WORKING PAPER NO. 655

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

Martin Chegere, Paolo Falco, Marco Nieddu, Lorenzo Pandolfi, and Mattea Stein

November 2022

This version November 2024

A previuos version of the paper circulated under the title "*It's a Sure Win! Experimental evidence on overconfidence in betting behavior*"

University of Naples Federico II | **University of Salerno** | **Bocconi University, Milan**

CSEF - Centre for Studies in Economics and Finance
DEPARTMENT OF ECONOMICS AND STATISTICS – UNIVERSITY OF NAPLES FEDERICO II
80126 NAPLES - ITALY
Tel. and fax +39 081 675372 – e-mail: csef@unina.it
ISSN: 2240-9696

CSEF
Centre for Studies in Economics and Finance

WORKING PAPER NO. 655

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

Martin Chegere[*], Paolo Falco[†], Marco Nieddiu[‡], Lorenzo Pandolfi[§], and Mattea Stein[**]

Abstract
As sports betting is surging worldwide, so are concerns about excessive gambling. To explore the drivers of this phenomenon, we conduct an experiment investigating how regular sports bettors in urban Tanzania value sports bets and form expectations about winning probabilities. We find that subjects assign higher certainty equivalents and winning probabilities to sports bets than to urn-and-balls lotteries with identical odds, even though, in fact, they are not more likely to win. We complement the experimental evidence with original survey data on sports betting frequency and motives. Overall, our results suggest that systematic misperceptions of the risks and returns associated with sports betting may contribute to its booming popularity.

JEL classification: C91, D84, D91, G41, L83, O12.

Keywords: betting, misperceptions, framing effects, sports.

Acknowledgements: We are grateful to Oriana Bandiera, Nick Bloom, Drusilla Brown, Luigi Butera, Stefano Caria, Stefano DellaVigna, Pascaline Dupas, Laura Gee, Doug Gollin, John List, Cynthia Kinnan, Mats Koster, Maggie McMillan, Joshua Miller, Luigi Pistaferri, Adam Szeidl, seminar participants at Tufts University, CEU, the University of Naples Federico II, and the University of Cagliari, participants in the AFE Conference 2023, REUS Workshop 2023, CSAE Conference 2023, IMEBESS 2023, M-BEES 2023, and the Workshop on Networks and Development 2023 for their useful comments, and to Revocatus Paul and all our research assistants for their outstanding work. We thank DANIDA for financial support through the Embassy of Denmark in Dar es Salaam (GDRP Phase II Project). Lorenzo Pandolfi gratefully acknowledges financial support from the Unicredit Foundation. The trial was pre-registered in the AEA RCT Registry (ID: AEARCTR-0008447, Chegere et al. (2021)) and received IRB approval from the ethics committee of the Department of Economics at the University of Copenhagen. A previous version of the paper circulated with the tile "It's a Sure Win! Experimental Evidence on Overconfidence in Betting Behavior". All errors are our own.

[*] University of Dar es Salaam. E-mail: chegere.martin@udsm.ac.tz

[†] University of Copenhagen. E-mail: paolo.falco@econ.ku.dk

[‡] University of Cagliari. E-mail: mgnieddu@unica.it

[§] University of Naples Federico II and CSEF. E-mail: lorenzo.pandolfi@unina.it

[**] University of Naples Federico II and CSEF. E-mail: mattea.stein@unina.it

1 Introduction

Sports betting is a large and fast-growing industry with a global turnover of more than 70 billion USD in 2021 (Polaris, 2022). In the United States alone an estimated 60 million people bet regularly on sports (FSGA, 2022), and the sector is booming across the world, especially among the poorest in society (e.g., The Guardian, 2021). In developing countries – including those of Sub-Saharan Africa (AP News, 2022; DW, 2017) – sports betting is spreading very fast, drawing attention among both researchers and policymakers, increasingly concerned with the risks associated with excessive gambling.[1] Despite the magnitude of the phenomenon, however, little is known about the specific drivers of sports betting.

We contribute to bridging this knowledge gap through a lab-in-the-field experiment that investigates how sports bettors value their bets and form expectations about the associated winning probabilities. Participants in our experiment are regular sports bettors in urban Tanzania, a context akin to low-income settings in both developing and developed countries where sports betting is spreading rapidly.[2] In the experiment, subjects receive an endowment and are randomly offered either the possibility to bet it on a football match from the UK Premier League or to participate in a neutrally-framed (urn-and-balls) lottery with identical odds and prizes. The odds are based on publicly available odds posted by major betting companies. The proportions of balls in the urn-and-balls lotteries are set to replicate those odds so that the only difference between the two experimental arms is the way in which the lotteries are framed.

We elicit bettors' certainty equivalents by offering subjects the possibility to exchange the bet for a fixed amount of money before the outcome is revealed. This allows us to measure the lowest possible amount for which they would sell the lottery.

[1] In Tanzania, the setting of our study, several parliamentary debates have been held on the topic since 2018. Concerns about over-betting by youths, who often hope to earn a living from it, and involvement of children under 18 years (Habibu et al., 2020) led to a temporary ban on gambling advertising in early 2019, and tighter regulations and awareness-raising campaigns starting later that year (Gaming Board of Tanzania, 2021; 2022). This mirrors the situation in other African countries; e.g. the Kenyan government cracked down on the sports betting sector in 2019 citing similar reasons (Business Daily, 2023).

[2] The external validity of our findings is discussed extensively in the final section of the paper.

Comparing certainty equivalents under the two randomized framings allows us to isolate the valuation premium attached to sports betting, holding lottery fundamentals and risk preferences constant.[3] In addition to eliciting participants' certainty equivalents, we measure their subjective expectations of winning the lotteries under the two framings. By doing so, we can test whether sports betting drives systematic biases in gamblers' expectations relative to equivalent neutral lotteries.

Furthermore, we offer a randomized treatment to a subset of participants assigned to the sports betting arm, consisting of a more detailed explanation of how to translate odds into probabilities. This is an application to the sports-betting setting of information requirements recently adopted by policymakers in several countries for standard lotteries, which make it mandatory to inform consumers about odds or winning probabilities. Our results, therefore, speak to the efficacy of such policies in reducing excessive gambling. Finally, we collect detailed information on participants' actual betting patterns through a survey and paint a rich picture of betting behavior.

Two main results emerge from our experiment. First, bettors' certainty equivalents are significantly higher when lotteries are framed as sports bets. This implies that bettors attach a valuation premium to sports bets relative to neutrally framed lotteries with identical odds. Second, and consistent with this, we find that when lotteries are framed as sports bets, participants report a higher subjective probability of winning. Such difference in the subjective assessment of the chances of winning the sports bet relative to the neutral lottery is not explained by an objectively superior ability in predicting the outcome of a football match vis-à-vis the outcome of the urn-and-ball lottery: participants under the sports-betting framing on average make the same negative net winnings than those under the neutral framing. It is consistent, on the other hand, with the hypothesis that sports bettors systematically misperceive the risks and returns associated with their bets. Such misperceptions – which may be due to bettors' over-confidence in their ability to predict the outcome of football matches – lead them to underestimate

[3]To distinguish between the effect of the lottery framing on participants' choices from that on their valuation of the bets (conditional on betting on a given outcome), we allow half of the participants to choose the team (or color) on which they want to bet, while we assign a pre-fixed bet to the other half.

the risk of losing their bets and value them more relative to neutral bets with the same fundamentals.[4]

Importantly, we show that these findings are not driven by different *choices* (of what to bet on) induced by the sports betting framing: subjects assigned to a sub-treatment that does not allow them to choose the outcome to bet on, but rather gives them a pre-fixed bet on a team or color, also exhibit higher certainty equivalents and over-predict the probability of winning. Further, we find little evidence that the over-valuation of sports lotteries is primarily driven by subjects deriving greater utility from gambling on sports than from participating in neutral lotteries.

We complement the experimental evidence with novel stylized facts on the behavior of regular sports bettors. The rich survey on betting behavior that we conduct highlights that most bettors are from low-income backgrounds, bet frequently, and allocate a significant share of their income to this activity. Remarkably, 90% of respondents bet "to make money" rather than for enjoyment, which is consistent with utility from gambling being a factor of second-order importance in explaining the valuation premium. Instead, it further corroborates the importance of bettors' misperceptions about the actual odds associated with their bets, which is both more detrimental for poorer subjects and more difficult to overcome given an often lower educational background. Finally, our randomized information treatment shows that trying to remedy such distortions by explaining how to translate odds into probabilities does not significantly change bettors' perceptions and behavior. While this result may be partly due to limited sample size, it casts doubts on the efficacy of such a policy, at least in the context of sports betting, which is in line with similar evidence from different contexts (Zenker et al., 2016).[5]

This study makes novel contributions to our understanding of sports betting, a growing phenomenon of global interest, which raises particular concerns due to its

[4]This is consistent with the fact that the high profits of real betting companies, whose odds we use in the experiment, are in large part driven by their comparative advantage in predicting the outcome of sports events relative to the average bettor, in addition to the profit margin they may make by setting skewed odds exploiting bettors' biases (Levitt, 2004) or 'unfair' odds that imply negative expected winnings.

[5]In the context of Thai Government Lotteries, Zenker et al. (2016) show that informing households about winning odds does not reduce the price they are willing to pay for lottery tickets.

prevalence among the most disadvantaged in society and in light of recent waves of liberalization. Despite its significance, our understanding of the drivers of sports betting and of bettors' decision-making remains limited. Among recent studies, Herskowitz (2021) shows that financial constraints are an important factor contributing to the popularity of sports betting. He provides experimental evidence that demand for sports betting increases when people need liquidity to cover 'lumpy' expenditures.[6]. Other studies focus on sports bettors' biases. Donkor et al. (2023) show that sports bettors in the UK and Kenya bet systematically more on the teams they support, and are overly optimistic about their teams' chances of success. Levitt (2004) shows that individuals betting on American football tend to prefer favorite teams (relative to underdogs) and bookmakers are able to exploit this bias to make profits. By contrast, Snowberg and Wolfers (2010) provide evidence that horseracing bettors tend to systematically over-bet on underdogs. Finally, some studies find evidence of the so-called 'hot hand fallacy' in basketball betting, *i.e.*, the belief that past success predicts future success even though it does not (Gilovich et al., 1985). Recent work, however, revisits the evidence and shows that such belief may in fact be correct and profitably exploited by bettors (Miller and Sanjurjo, 2017; 2018; 2021).[7]

We are the first to provide experimental evidence of a systematic valuation premium associated with sports gambling relative to neutrally framed lotteries with identical odds, thus holding constant general attitudes toward gambling. Our results suggest that such a premium is associated with bettors' misperceptions of the risks and returns from sports gambling, consistent with the hypothesis that sports bettors may overestimate their ability to predict the outcomes of sports events.

We also contribute to a larger literature on gambling behavior in general. Some studies in this literature propose *rational* explanations for agents' willingness to participate in (typically unfair) lotteries. For instance, gamblers may be risk-loving (Ali, 1977),

[6]This is also consistent with evidence on UK lottery winners who use lottery windfalls to finance lumpy purchases (Crossley et al., 2016)

[7]Our work is also related to recent studies that leverage familiarity with, and a love for, gambling in developing countries to incentivize take-up and use of formal saving products (Dizon and Lybbert, 2021; Cole et al., 2022), or disincentivize risky sexual behavior Björkman Nyqvist et al. (2018) by offering lotteries rather than fixed payouts.

may enjoy the act of gambling even though risk-averse (Conlisk, 1993; Le Menestrel, 2001; Clotfelter and Cook, 1991), may have a preference for return skewness (Garrett and Sobel, 1999; Grossman and Eckel, 2015), or may bet on the chance of life-changing winnings (Friedman and Savage, 1948). Other studies, particularly related to ours, instead emphasize the role of systematic biases in gamblers' decision-making and biased learning from experience. Previous research has documented upwardly distorted beliefs and myopic decision-making among purchasers of lottery tickets (Haisley et al., 2008) with limited evidence on the efficacy of debiasing information-based interventions (Williams and Connolly, 2006; Zenker et al., 2016; Abel et al., 2020).[8] Consistent with these studies, participants in our experiment exhibit distorted beliefs about winning probabilities that do not respond to an information intervention. Instead, they selectively recall gambling episodes that resulted in positive average winnings in the weeks prior to the experiment. This type of selective recall may help to explain why learning is limited and biases persist (Benabou and Tirole, 2002; Möbius et al., 2022; Eil and Rao, 2011).[9]

More broadly, we contribute to a growing body of work documenting misalignment between agents' expectations and market outcomes. This finding recurs in a range of contexts, including workers' beliefs about their employment prospects (Banerjee and Sequeira, 2023; Bandiera et al., 2023), firm managers' expectations about their workers (Caria and Falco, 2022; Abebe et al., 2022), and parents' beliefs about returns to education (Jensen, 2010). Our work also speaks to a growing literature documenting overconfidence in a broader range of contexts, including investment decisions and the creation of speculative bubbles (Barber and Odean, 2001; Menkhoff et al., 2013; Daniel and Hirshleifer, 2015; Michailova and Schmidt, 2016), entrepreneurship and managerial decisions (Camerer and Lovallo, 1999; Cain et al., 2015; Malmendier and Tate, 2015), consumer choices (Grubb, 2015; Della Vigna and Malmendier, 2006), and under-insurance (Sandroni and Squintani, 2013). In developing countries, recent work has focused on the role of overconfidence in driving the riskiness of farmers' crop portfolios (Barsbai et al.,

[8] Blumenstock and Olckers (2021) find that mobile phone sports-bettors in Kenya are as likely to adjust their betting behavior following good and bad news.

[9] See also Williams and Siegel (2013) for a review of other studies on the economics of gambling.

2022) and in risk-taking among micro-entrepreneurs (Seither, 2021).

2 Setting the Scene: Betting Habits in a Low-Income Context

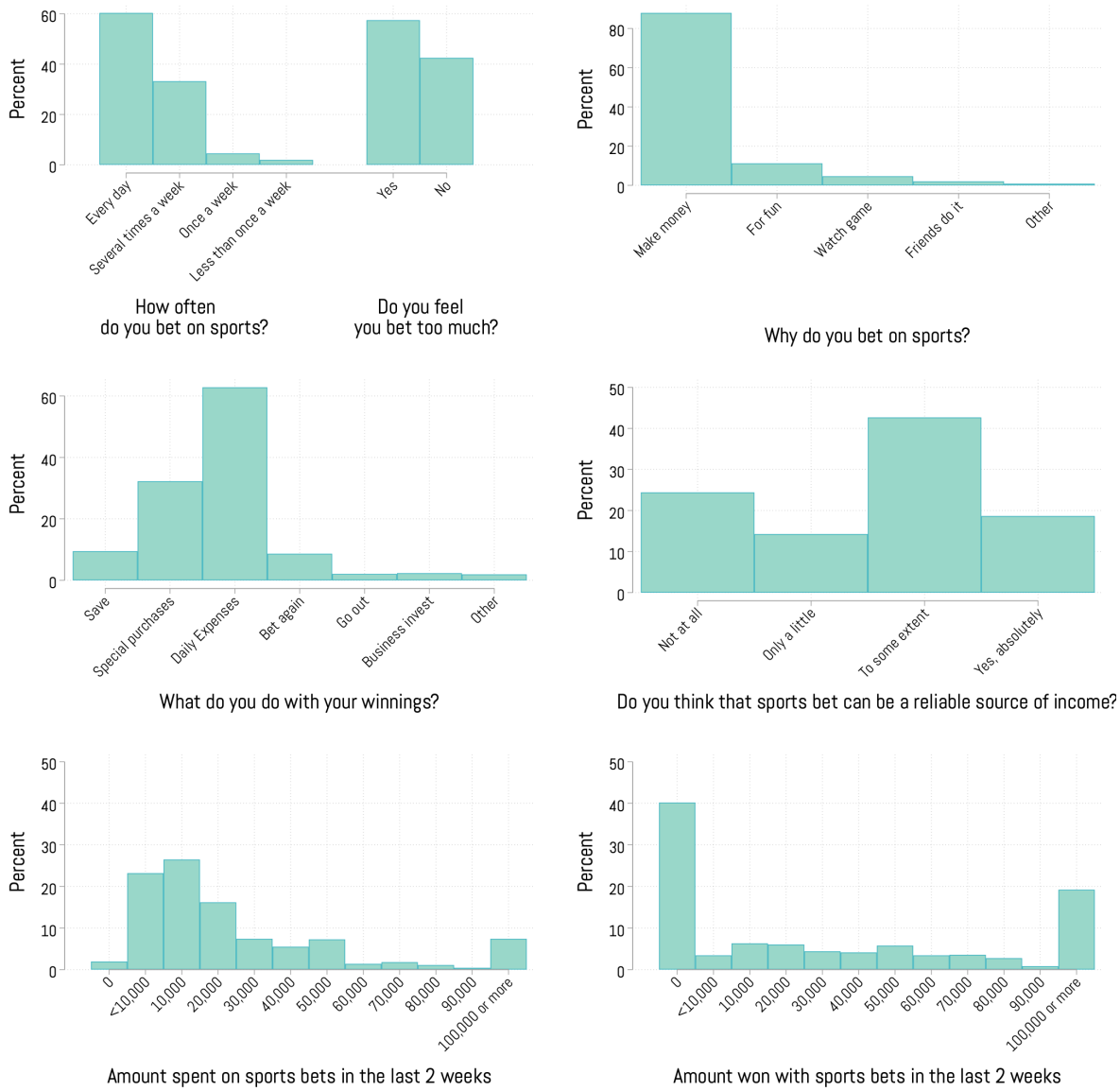
To set the scene, we use the data we collected to provide some novel stylized facts on betting behavior in a low-income context. The subjects of our study are regular bettors from Dar es Salaam, the largest city in Tanzania, a low-income urban setting akin to many other growing cities both in the developing world and in advanced economies. Half the country's 2,684 betting shops are located in Dar es Salaam (Citizen, 2021). We sampled our participants outside such betting shops, as detailed below.

After participants completed the betting experiment (detailed below), we asked them a series of questions about their betting habits and previous experiences. Answers to some of these questions are summarized in Figure 1.

The first remarkable fact we document is that 60% of participants in our study report betting on sports on a daily basis, and another 33% of them do so several times a week. Only 6% of participants place one sports bet per week or less. Additionally, 57% of individuals feel that they bet more than they should.

The second important fact is that, when asked about the reasons for betting, almost 90% of participants indicate that they aim 'to make money' as one of the reasons, while only 15% (also) refer to it as a form of leisure (i.e., they answer either 'for fun', 'to watch the game', or both). Rather than a purely recreational activity, therefore, sports betting is approached as an income-generating activity by most participants. Indeed, in line with this, 61% of participants consider (at least to some extent) sports betting to be a reliable source of income. Only 1 in 4 participants states that sports betting cannot be a reliable source of income. When asked what they do with winnings from sports bets, the vast majority of participants report using the money to cover daily expenses or make special purchases. This is consistent with work by Herskowitz (2021) in neighboring Uganda, showing that gambling is a tool to finance lumpy investments. Only about 9%

Figure 1: Betting Habits



NOTES. This figure depicts participants' answers to the questions on betting habits they answered at the end of the experiment. Sample size: 729 individuals.

of our respondents save the money from winnings, and a similar share uses the money for a new bet.

Third, we find that sports betting absorbs a sizeable share of bettors' earnings and that, for many, it results in financial losses. Nearly one-half of subjects in our sample spent at least 20,000 Tanzanian Shillings (TSh) on sports betting in the two weeks prior to the experiment, equivalent to over 15% of median monthly earnings in Dar es Salaam (and to an even larger fraction of median earnings in our sample, see below). Median net

winnings (the amount won minus the amount bet) are zero, and one-half of the sample experienced a net loss over the past two weeks.[10]

Looking at the socio-demographic characteristics of the subjects in our sample adds important elements to the picture and highlights clear similarities with typical bettors from both developed and developing countries (discussed in the final section). As shown in Table 1, our subjects are almost exclusively male, and three-quarters would describe themselves as football experts; the average age is 32 years (with a range of 18-68). Among monthly earners, 74% of subjects earn less than 300,000 TSh (approx. 128.8 USD) per month. Among daily earners, 43% earn less than 10,000 TSh per day (approx. 4.3 USD).[11] Overall, median earnings in our sample are below the median in Dar es Salaam (about 280,000 TSh per month), according to the Tanzania National Panel Survey (TNPS) data of 2019-20 (World Bank, 2022). The large majority of participants do not have tertiary education, in line with the population of Dar es Salaam (World Bank, 2022). 45% have completed at most primary school and 88% have completed at most 4 years of secondary education ("O-levels"). Only 12% of subjects have completed six years of secondary school ("A-levels") with some continuing to tertiary education. Sample characteristics are balanced across experimental groups (see Appendix Table A1).

To sum up, three key facts emerge from our survey of regular bettors: (i) sports bettors tend to spend considerable amounts on betting, they place bets very frequently and often acknowledge they tend to over-bet (i.e., they say they bet "more than they should"); (ii) the majority of bettors consider betting a way to generate income and cover daily expenses; (iii) the vast majority of bettors are men without tertiary education, and three quarters consider themselves football experts.

These stylized facts are an interesting point of departure for our experimental analysis, which aims to assess whether excessive betting may be due to misperceptions of the actual risks and returns associated with sports betting.[12]

[10]Furthermore, 40% of gamblers experienced *gross* winnings of zero, meaning that any amount they bet was fully lost (Figure 1, bottom right panel).

[11]The majority of subjects are self-employed, as the majority of workers in Tanzania (Tanzania National Bureau of Statistics, 2021).

[12]Further information about the betting habits of participants can be found in Appendix Table A2.

Table 1: Sample Characteristics

	N	Mean	Sd	Min	Max
Male	729	0.99	0.10	0	1
Age	729	32.09	8.70	18	68
Self-assessed football expert	729	0.75	0.43	0	1
Education: None	728	0.03	0.18	0	1
Education: Primary	728	0.42	0.49	0	1
Education: Secondary (4 yrs)	728	0.43	0.49	0	1
Education: Secondary (6 yrs) or univ.	728	0.12	0.33	0	1
Lives with 4+ family members	729	0.55	0.50	0	1
Monthly family income <50k TSh	729	0.27	0.44	0	1
Monthly family income 50k-200k TSh	729	0.43	0.50	0	1
Monthly family income 200k-500k TSh	729	0.22	0.42	0	1
Monthly family income >500k TSh	729	0.08	0.27	0	1
Self-employed	729	0.60	0.49	0	1
Employed (worker)	729	0.26	0.44	0	1
Unemployed	729	0.14	0.35	0	1
Wage frequency daily	588	0.70	0.46	0	1
Daily wage >10k TSh	412	0.57	0.50	0	1
Monthly wage >150k TSh	176	0.65	0.48	0	1
Monthly wage >300k TSh	176	0.26	0.44	0	1
Sector: Agriculture, forestry, fishing	625	0.07	0.25	0	1
Sector: Manuf., motor, constr., transp.	625	0.30	0.46	0	1
Sector: Retail, wholes., accomm., food	625	0.28	0.45	0	1
Sector: White collar	625	0.07	0.26	0	1
Sector: Other	625	0.28	0.45	0	1

3 Experimental Design and Sampling

3.1 Baseline Experiment

The experiment is centered around the comparison of subjects' choices under two types of lottery framings. At the beginning of the experiment, all participants received an endowment of 10,000 TSh (approx. 4.30 USD or a day's median wage among daily workers in our sample) and were randomly assigned to one of two lottery types. Under the first type, they were asked to bet their endowment on one of the possible outcomes of an English Premier League game to be played the same evening ('sports betting'). Under the second type, they were asked to bet on the outcome of a neutral urn-and-balls lottery (choosing the color of a ball to be drawn from an urn at the end of the session,

'neutral lottery'). In both cases, participants had to bet the full endowment and could not choose not to bet. The bets presented in the sports betting arm were akin to the simplest ones that are usually offered by betting companies. Participants could bet on one of three possible outcomes: Team 1 wins, Team 2 wins, Draw. The experiment was conducted over 7 non-consecutive days between December 18, 2021, and February 19, 2022. We used 7 Premier League matches in total (one on each day of the experiment).[13] The odds associated with each outcome were taken from the websites of major online betting companies on the day of the experiment. We first computed the probabilities implied by the odds – by taking the inverse of the odds further rescaled by the sum of these ratios (which is not equal to one because of bookmakers' profit margin) – and then translated these probabilities into corresponding proportions of differently colored balls in the neutral urn-and-balls lottery framing.[14] The urn contained 100 balls of three different colors (matching the three possible outcomes of the football match) and each color was associated with a different prize, inversely proportional to the share of balls of that color in the urn, thus also replicating the prizes of the sports-bet lottery. At the end of the experiment, respondents assigned to the neutral lottery drew one ball from the urn (a black bag) and found out what their winnings were. To ensure full comparability, the experiment was presented to participants assigned to the two arms using the same format and script. The instructions carefully outlined all the options and, in both arms, respondents had a chance to review their choices before confirming, which induced careful reflection and reduced inattentive decisions. Also for comparability, participants in the neutral-lottery arm did not receive the winnings until the same evening, when those in

[13]The full list of matches we used is the following: Leeds vs. Arsenal, Tottenham vs. Liverpool, Manchester City vs. Chelsea, Liverpool vs. Brentford, Manchester United vs. West Ham, Crystal Palace vs. Liverpool, and Manchester City vs. Tottenham.

[14]In principle, the implied probabilities may not necessarily correspond to the objective probabilities associated with the game outcomes. Crucially, however, bookmakers set the odds based on the assessment of specialized experts and adjust them based on the flow of bets received and, more importantly, on the odds set by competing bookmakers. If two bookmakers set different odds, bettors would have arbitrage opportunities to exploit, as they could bet on two mutually exclusive events with different bookmakers, creating a zero-risk bet with positive expected profits. This process leads the odds by different bookmakers to converge and eventually reflect all of the information available to market participants–i.e., analysts and bettors–akin to asset prices in financial markets. Finally, it is reasonable to assume that bettors in our sample have no superior information compared to the rest of the market participants about the Premier League matches we cover.

the sports-bet arm found out the outcome of the game.[15]

The experiment was conducted on tablets handed to participants by members of the research team, who were available to provide explanations throughout the session.[16] We collected phone numbers and explained that we would transfer the winnings via mobile money (a very common payment method in Tanzania) at the end of the day. We also asked participants to complete a survey on betting habits. At the end of the experiment, all respondents received a 5,000 TSh participation fee, which was independent of the outcome of the bet.

For a subgroup of subjects, we played a modified version of the experiment, whereby we *fixed the outcome* of the bet – that is, the outcome of the game for subjects under the sports-bet framing and the corresponding ball color for those under the urn-and-ball framing – and gave subjects the resulting ticket. In other words, participants in this arm ('No Choice') could not choose which outcome (team or ball color) to bet on and were passive recipients of the winnings if the outcome of the bet was realized. This helps us to address the endogeneity of the chosen outcome when analyzing misperceptions.[17]

For easiness of exposition, we name the group that received the sports framing and could choose which outcome to bet on 'Group A', the group that received the sports framing but could not choose the outcome of their bet 'Group B', the group that received the neutral framing and could choose the outcome 'Group C', the group that received the neutral framing but could not choose the outcome 'Group D'.

[15] We considered running the random draw in the evening and communicating the result to the respondents then. This would not have affected their decisions but it would have posed additional concerns about the extent to which respondents would have trusted the outcome of a lottery they could not witness (in contrast to the outcome of a football game that is public information). For this reason, we opted for simplicity and revealed the outcome immediately after the experiment, while the payment was postponed for comparability.

[16] After obtaining informed consent, we explained to participants that the exercise was conducted for research purposes and that bets were placed with the research team, not with a real betting company.

[17] Specifically, by giving participants in this arm a pre-determined bet on a given outcome, we can disentangle the effect of the sports framing on the *choices* made by participants (i.e., the outcome they choose to bet on) from the effect on the *valuations* of the bets (i.e., the difference in the value assigned to the same lottery when framed as a sports bet rather than a neutral lottery).

3.2 Information treatment to explain the odds

We also introduced an additional information treatment that was randomized within groups A and B. In addition to the game odds normally provided by betting companies, half of the subjects in those groups were shown the *probabilities* of each outcome implied by those odds (groups A1, B1). The other half only received the odds as in the baseline setup (groups A2, B2). The objective was to replicate and test the effectiveness of an approach used by gambling authorities to facilitate a correct assessment of winning probabilities among bettors.[18]

To sum up, on each day of the experiment, our design randomly assigned participants to one of six groups (A1, A2, B1, B2, C, D, as summarized in Table 2). Each of the six groups comprises approximately one-sixth of the subjects in the sample.[19]

3.3 Eliciting certainty equivalents and subjective probabilities

After participants placed their bets but before the outcome was revealed, we elicited participants' certainty equivalents for the bets. To this end, we showed subjects in all groups a list of prices. For each price, we asked them to choose whether they would prefer to sell the bet or neutral-lottery ticket and receive that price with certainty, or keep the ticket and await the outcome of the match or urn draw. We incentivized this question by explaining to participants that, after making their choices, a random buy-back price from the list would be drawn and implemented.[20]. It was made clear that this amount would be paid at the end of the day (the same as any winnings from the sports bet or

[18]Gambling authorities in the United Kingdom, Italy, and France, for example, have mandated providers of lottery tickets and/or scratch-card betting to provide customers with information on winning probabilities before betting (e.g., UK Gambling Commission (2020)). In practice, this is implemented by stating on the back of scratch cards one in how many cards will win for each of two to three prize brackets (Italy, Agenzia delle Accise, Dogane e Monopoli (2022)), or one in how many will win any prize (United Kingdom), or by listing the total number of printed tickets and the total number of winning tickets for each possible prize (France). We constructed this experimental arm with the aim of applying this type of information treatment to sports betting.

[19]See Table A1 for the exact figures.

[20]That is, if they chose "sell" for this amount, they would receive the amount and not participate anymore in the sports bet/lottery; if they chose "keep" for this amount, they would keep their ticket and participate in the sports bet/lottery

Table 2: Summary of Experimental Groups

	Sports-betting		**Neutral lottery**
	Info treatment	No info treatment	
Choice	***Group A1***: Subjects shown odds of a Premier League game and asked to place a bet (Team 1 wins, Draw, Team 2 wins). They receive the information treatment.	***Group A2***: Subjects shown odds of a Premier League game and asked to place a bet (Team 1 wins, Draw, Team 2 wins).	***Group C***: Subjects asked to bet on outcome of a neutral lottery (Color 1, Color 2, or Color 3) after being shown the proportions of colors in the urn and the corresponding winnings.
No choice	***Group B1***: Subjects shown odds of a Premier League game and given a ticket for an already-placed bet (Team 1 wins, Draw, Team 2 wins). They receive the information treatment.	***Group B2***: Subjects shown odds of a Premier League game and given a ticket for an already-placed bet (Team 1 wins, Draw, Team 2 wins).	***Group D***: Subjects shown the proportions of colors and the corresponding winnings in a neutral lottery and given a ticket for an already-placed bet (Color 1, Color 2, Color 3).

neutral lottery) to avoid issues of present bias affecting the choice to sell.

In addition, immediately after participants placed their bets, we also elicited their subjective probabilities for each of the three lottery outcomes, by asking them to assess the likelihood of each outcome on a 0-100 scale (further details are provided when we discuss the results below). We did this by means of visual aids to ensure clarity and minimize the cognitive load.[21]

[21]The expectation questions were framed equally in the different experimental groups. Also, they were not incentivized to avoid complicating the design excessively and in light of recent literature that has successfully used unincentivized expectation questions, including in contexts similar to our own (Caria and Falco, 2022). In any case, this is unlikely to be an important concern for our analysis since we concentrate on the *difference* in expectations between the neutrally-framed lottery and the sports bet and we have no reason to believe that incentivizing the expectation question would have had different impacts between the two versions. Finally, the questions on expectations were asked before the elicitation of the certainty equivalent in order to avoid rationalization (i.e., subjects reporting subjective expectations that should rationalize their chosen certainty equivalent).

3.4 Sampling Strategy

We conducted the experiment with a sample of 729 bettors who visited selected betting shops in Dar es Salaam. The experiment took place outside the shops and participants were recruited among the shop customers. The selected locations were betting shops belonging to mainstream companies that were willing to work with the experimenters (Throne-bet, GAL Sport Betting, Meridian-bet, Play-Master bet, and Premier-bet). Specifically, we selected betting shops from different areas within three out of the five districts of Dar es Salaam (Ilala, Kinondoni, and Ubungo). The choice of areas was informed by the objective to attain diversity in economic activity (residential vs. commercial area) and income levels (low, middle, high). This strategy delivered interesting heterogeneity, but it was not meant to attain representativeness of the general population.

The research team arrived at the betting shops three to four hours before the start of the selected Premier League game of the day. That was the best time to find a large number of bettors in the shops. Research assistants went into the shop with the permission of the owners and recruited subjects for the experiment among the customers. The experiment was conducted outside the shop in a quiet nearby location where subjects were given tablets and the research assistants were available to provide explanations.[22] Randomization into different treatment arms was conducted by the survey software (Qualtrics) at the start of the experiment.

4 Results

This section presents our experimental results, drawing on the comparison between the sports bet and the neutral bet. Our main result is that a sports framing triggers higher subjective valuations (certainty equivalents) of the bets. We also find that the sports framing triggers higher subjective probabilities of winning – despite an equal probability of *actually* winning. We find that our odds-training intervention has a limited impact on

[22]The subjects were distanced and could not discuss with one another during the experiment. Also, we prevented players from participating more than once in the experiment.

gamblers' valuations of the sports bets and on their expectations.

4.1 Sports betting induces higher certainty equivalents

The first finding from the experiment is that the average certainty equivalent in the sports bet is higher than the average certainty equivalent in the urn lottery despite the two having identical underlying odds (Figure 2). This is evident in both the choice and the no-choice arm, that is, both when subjects can choose the team/color on which they want to bet and when they are given a pre-made bet.

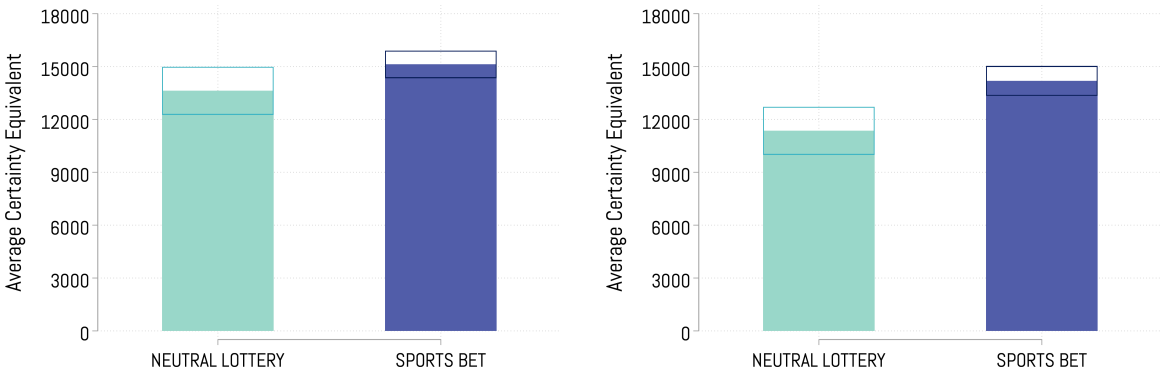
To probe this result further, we run a series of regressions where we estimate the effect of the sports framing on the certainty equivalent controlling for day fixed effects and participants' characteristics, and taking into account with a Tobit model that the certainty equivalent is capped at 20,000 TSh. The results, reported in Table 3, confirm that the sports framing induces significantly larger certainty equivalents relative to a neutral lottery with identical odds. The difference is similar in the choice arm (Col. 1, 1,742 TSh) and the no-choice arm (Col 3, 2,754 TSh), and it grows once we account for the truncated nature of the data (3,135 TSh in Col. 2 and 5,202 TSh in Col. 4, in the choice and no-choice arm respectively).[23] These are large magnitudes, as evidenced by the fact that the lowest estimated coefficient of 1,742 corresponds to about 17% of the initial endowment (10,000 TSh) and to about 13% of the average certainty equivalent in the neutral lottery.[24]

We also go a step further to allow for a more accurate comparison between the choice and the no-choice arm. To this end, we start with the observation that the effect of the sports framing in the choice arm is the result of two distinct effects. First, the sports framing may induce participants to *choose different outcomes* to bet on. For instance, it may induce them to choose more often the lowest-paying, safest, team. Second, *conditional on choosing an outcome (team)*, the sports framing may increase the value

[23] That is because the share of participants who are not willing to sell the lottery ticket even when offered the largest possible safe amount (20,000 TSh) is larger in the sports-bet group than in the urn-lottery group.

[24] In the baseline specification, we control for participants' age, gender, education, income, and self-assessed football knowledge. The *Sports Bet* coefficient is unchanged when we do not include these controls, albeit more imprecisely estimated (and not significant in Column 1 and 2).

Figure 2: Certainty Equivalents



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

NOTES. This figure depicts the average certainty equivalent for participants in the Choice (left) and No-Choice (right) arms. In each panel, the certainty equivalent is presented separately for those who receive the neutral and sports-bet lottery. The certainty equivalent is defined as the amount at which an individual starts preferring to sell the sports bet (or the neutral lottery ticket) and receiving that amount with certainty rather than keeping the ticket.

Table 3: Sports betting induces higher certainty equivalents

	Choice		No choice		Choice condit.
	(1) OLS	(2) Tobit	(3) OLS	(4) Tobit	(5) OLS
Sports Bet	1741.61*	3134.59*	2753.51***	5201.57***	2844.83***
	(965.11)	(1877.37)	(984.75)	(1726.62)	(1079.83)
Day-by-outcome FE	No	No	No	No	Yes
Mean dep. var (Neutral Lottery)	13557.69	13557.69	11352.94	11352.94	13557.69
Std. dev. dep. var	8402.30	8402.30	8282.93	8282.93	8402.30
Observations	334	334	330	330	334
R-squared	0.060		0.070		0.107

NOTES.: This table reports the estimated effect of the sports bet framing on the certainty equivalent. In all columns, the dependent variable is defined as the amount at which an individual starts preferring to sell the sports bet (or the lottery ticket) and receiving that amount with certainty rather than keeping the ticket. *Sports Bet* is a dummy variable that equals one if an individual receives the sports bet and 0 if s/he receives the neutral lottery. All columns include controls for participants' age, education, income, and self-assessed football knowledge; Column 1, 2, 3, and 4 also include day fixed effects, while Column 5 includes day×outcome fixed effects. Column 1, 2, and 5 consider only participants in the choice arm, who can choose the outcome to bet on. Column 3 and 4 consider participants in the no-choice arm, who were given a ticket for an already-placed bet. Coefficients in all columns except 2 and 4 are estimated by OLS, while the ones in Column 2 and 4 are obtained from a Tobit model, which accounts for the upper limit on the safe amount offered to participants (20,000 TSh). Robust standard errors in parentheses.

that participants attach to the bet (i.e., their expected likelihood that the outcome will occur). In the no-choice arm, the second effect is the only one at play.

Hence, to draw a more accurate comparison in Col. 5 of Table 3 we add *day*×*outcome* fixed effects to the specification in Col. 1, where an *outcome* is one of the three possible results of a match (Team A wins, Draw, Team B wins) or one of the

three corresponding colors in the urn. This implies that we now estimate the coefficient of interest by comparing the certainty equivalents of players who choose a given outcome under the sports framing *only with players who choose the corresponding outcome under the neutral framing* (e.g., players who choose the lowest paying outcome under the sports framing are compared to those who choose the lowest paying outcome under the neutral framing). Although the outcome in the choice arm is determined endogenously and the value of this comparison may thus be limited, this exercise is nonetheless instructive. Upon doing this, the estimated coefficient becomes larger and more statistically significant. As expected, it is close to the coefficient from the OLS regression in the no-choice arm (Col. 3, Table 3), where the first of the two effects outlined above is shut down by design.

It is worth noting that in the no-choice arm, the pre-fixed bet we chose to offer was typically placed on the most likely outcome (i.e., the top team), which was *also* the team most respondents picked in the choice arm (Figure 3). This design choice helped us meet budgetary constraints (as riskier bets may have triggered large payouts) and ethical considerations while preserving the validity of our test.[25] It is also worth noting that, while the effect of the sports framing appears to be larger in the no-choice arm relative to the choice arm, bets in the latter group are valued more, on average, regardless of the framing. This is consistent with the fact that participants in the no-choice arm would have sometimes preferred to bet on a different outcome if given the opportunity.

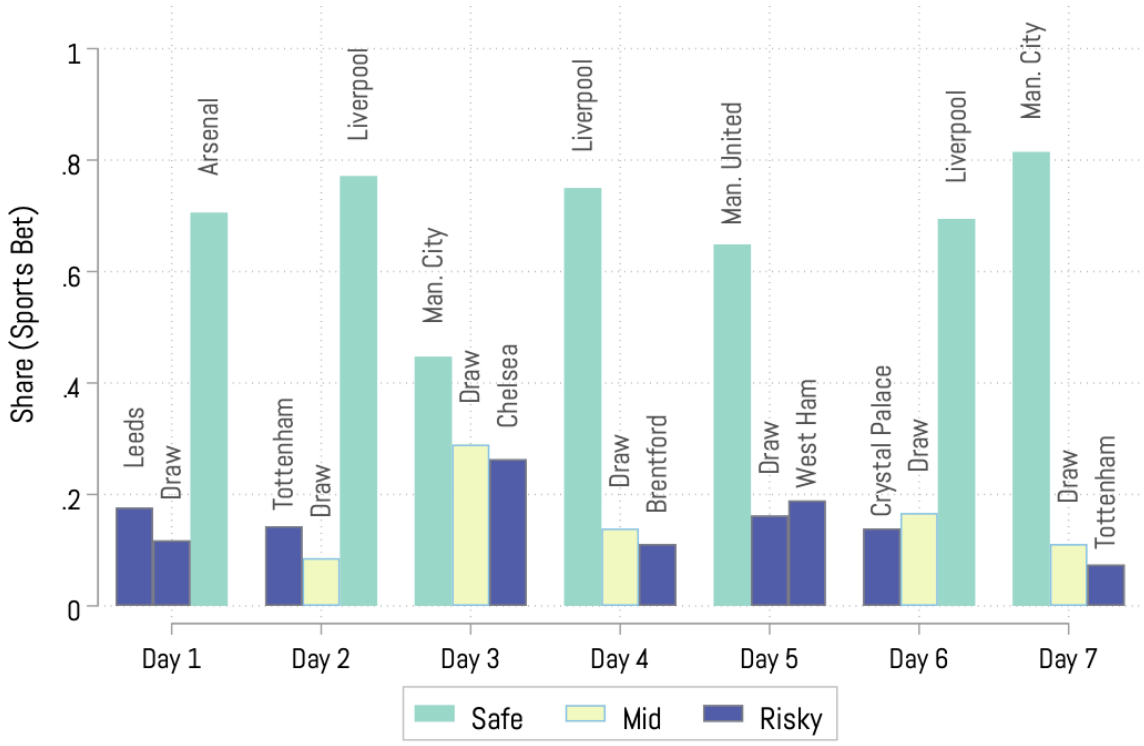
4.2 Sports betting induces higher expectations of winning

The second finding from the experiment is that sports bettors overestimate their probability of winning. To measure participants' expectations, we asked them to indicate on a 0-100 scale how likely they thought each lottery outcome was. The expected probability of winning is the one associated with the outcome they bet on.[26]

[25] Although the test is confined to the safest outcomes, it is a valid measure of how being able to choose the outcome on which to bet affects perceptions. In future work, one may investigate heterogeneous effects by offering a range of outcomes for the pre-fixed bet.

[26] We divide the three stated probabilities by their sum. This rescaling was necessary because we did not want to force the answers to sum to 100, as this may have primed subjects. We also asked a more direct but less refined question: "How likely do you think it is that you will win your bet on a scale

Figure 3: Participants' betting choices



NOTES. This figure depicts, for each day of the experiment, the share of participants in the choice arm of the sports bet group who chose to bet on each of the possible game outcomes. The most likely (safest) outcome according to the odds is colored in light blue. The second most likely outcome is colored in yellow. The least likely outcome (riskiest) is colored in dark blue. Two bars have the same color when the two riskier outcomes are equally likely. In the no-choice arm, the pre-fixed bet is always on the most likely (safest) outcome.

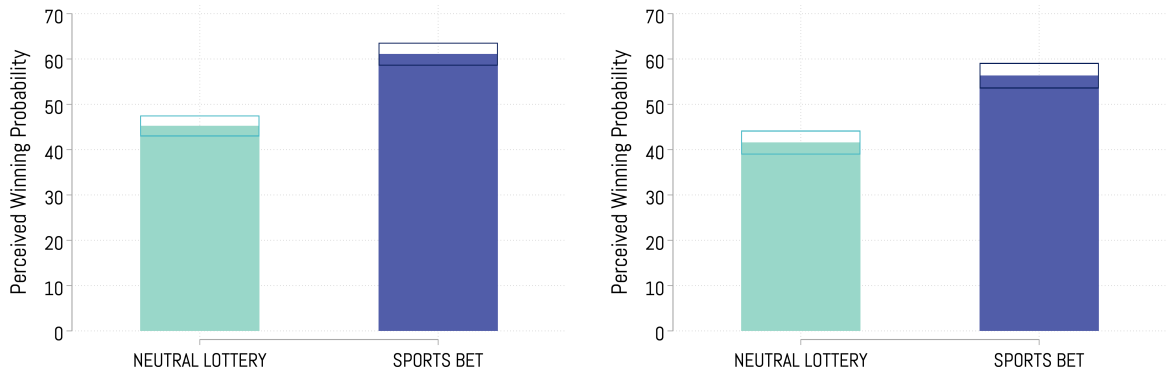
Figure 4 shows the average subjective probability of winning by type of framing (the lighter bars capture the neutral lottery, the darker bars capture the sports framing), splitting the sample into the choice arm (Panel a) and the no-choice arm (Panel b). The figure shows a consistent picture across the two arms: under the sports framing, subjective probabilities of winning are significantly higher.[27]

As in the previous section, we probe the raw results further by estimating a series of regressions that control for individual characteristics and day fixed effects (Table 4). We find that with the sports framing subjective expectations of winning are approximately

from 0 to 100?". As expected, the results are similar but less precise if we measure subjective winning probabilities using the answers to this question.

[27]In this context, the no-choice arm serves the additional purpose of helping us to exclude the possibility that subjects report subjective probabilities of winning that are meant to rationalize (i.e., be internally consistent with) their chosen outcome as if to "justify themselves". Since the average subjective probability of winning is higher under the sports framing *even in the no-choice arm*, we do not find support for this kind of cognitive dissonance.

Figure 4: Perceived probability of winning



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

NOTES. This figure depicts the average perceived probability of winning among participants in the Choice (left) and No-Choice (right) arms. In each panel, the perceived probability of winning is the answer to the question "What do you think are the chances (in percentages) that each of the following events will happen?", where events are either the colors of the ball or the outcomes of the football match (1, X, or 2), for the event they bet on. As participants' possible answers are not constrained to sum to 100, the answers are re-scaled by the sum of the three likelihoods stated. The average perceived probabilities are presented separately for those who receive the neutral and the sports-bet lottery.

16 percentage points higher in the Choice arm (Col. 1) and 14 percentage points higher in the no-choice arm (Col. 2). The conclusions are unchanged when we control for *day*×*outcome* fixed effects in Column 3. As in the previous section, this is done with the objective of comparing participants who bet on equivalent outcomes under both framings.

We conclude that a sports framing increases subjects' perceived likelihood of winning. This is consistent with the evidence on certainty equivalents presented above and suggests that the overvaluation of sports bets relative to standard lotteries may be driven at least partly by bettors' misperceptions of the lottery fundamentals. Section 5 discusses this mechanism in greater detail.

4.3 Explaining the odds of a bet to gamblers has little impact

One possible explanation for bettors' incorrect expectations is that they may not understand the odds as an expression of the likelihood of winning the bet but rather as an indication of their potential winnings (i.e., they only see the odds as the factor by which their stakes are multiplied in case of success). The idea that gamblers may be unaware of winning probabilities has driven gambling authorities in countries such as the United

Table 4: Sports betting induces higher expectations of winning

	(1) Choice	(2) No choice	(3) Choice condit.
Sports Bet	16.13***	14.12***	11.33***
	(2.17)	(2.35)	(2.59)
Day-by-outcome FE	No	No	Yes
Mean dep. var (Neutral Lottery)	45.21	41.56	45.21
Std. dev. dep. var	15.14	17.48	15.14
Observations	361	367	361
R-squared	0.175	0.164	0.236

NOTES.: This table reports the estimated effect of the sports bet framing on participants' perceived probability of winning. This is defined as the answer to the question "What do you think are the chances (in percentages) that each of the following events will happen?", where events are either the color of the ball or the outcome of the football match (1, X or 2). As participants' possible answers are not constrained to sum to 100, these are re-scaled by the sum of the three likelihoods stated. In all columns, Sports Bet is a dummy variable that equals one if an individual receives the sports bet and 0 if s/he receives the neutral lottery. All columns include controls for participants' age, education, income, and self-assessed football knowledge; Column 1 and 2 also include day fixed effects, while Column 3 includes day×outcome fixed effects. Column 1 and 3 consider only participants in the Choice arm, who can choose the outcome to bet on. Column 2 considers participants in the no-choice arm, who were given a ticket for an already-placed bet. Coefficients in all columns are estimated through OLS. Robust Robust standard errors in parentheses.

Kingdom, Italy, and France to require lottery operators to provide such information explicitly.

In order to shed light on the efficacy of such a policy tool and, more generally, to test the role of gamblers' limited understanding of betting odds, we randomized an information treatment among participants in the sports lottery arm. Half of the participants in this group were given only the standard odds of each game outcome; the other half were also shown the probability of each event implied by the odds. Appendix Table A5 presents the effects of this treatment (pooling together the choice and no-choice arms). The effect of the additional information on the certainty equivalent of the lottery (Col. 1 and 2) and on the perceived probability of winning (Col. 3) is small and statistically insignificant. While potentially driven by the limited sample, at least partially, this result is consistent with the evidence in Zenker et al. (2016) who show that informing Thai households of the winning probabilities of a Government Lottery did not reduce willingness to pay for lottery tickets. In sum, providing information on the underlying probabilities appears to have a limited impact on gamblers' choices. While a fully-fledged

policy evaluation is beyond the scope of this article, this can inform regulators' future attempts to improve bettors' understanding of their gambles.

5 Discussion of Mechanisms and External Validity

In this section, we discuss two prominent mechanisms that may drive our results (Section 5.1) and offer some careful reflections on the external validity of our findings following List (2020) (Section 5.2).

5.1 Mechanisms

Two channels may prominently contribute to explaining our findings. First, the valuation premium that gamblers attach to sports bets may be due to extra utility they derive from betting on sports as compared to participating in neutrally framed lotteries. For instance, betting on a football match and then watching the game to find out the outcome may generate higher utility than participating in a neutral lottery with comparable risks and returns. Similarly, bettors may enjoy placing bets on their favorite teams, consistent with Donkor et al. (2023). In such cases, part of the valuation premium attached to sports bets could be interpreted as a price that bettors pay to participate in an activity they enjoy.

While we cannot conclusively test for this utility channel, three pieces of evidence from our survey suggest it has a limited role in explaining our main results. First, our survey asks participants about their primary motivation for betting on football. Only a minority state that they bet primarily for fun. As discussed above, the majority report that they bet for financial considerations (and specifically to "make money", see Figure 1). Second, among those who do report that sheer enjoyment is their primary driver, we do not find evidence of higher certainty equivalents compared to the rest of the sample (see Appendix Table A4), especially when focusing on the 'No Choice' arm. Third, among subjects in the sports-betting arm, the share of those who report that they bet on a specific team because it is their favorite (22%) is similar to the share of those who bet on

their favorite color in the urn-and-ball lottery (25%).

Taken together, these pieces of evidence lend little support to the utility channel being the key reason why individuals have higher certainty equivalents for sports bets than equivalent neutral bets. Ruling out this potential channel is however beyond the scope of this paper and will require additional future investigation.[28] Notwithstanding the potential role of utility in driving certainty equivalents, however, such a mechanism could not as easily explain the higher subjective probabilities of winning (which have no bearing on utility) attached to sports bets.

The second plausible explanation for our results is that bettors consider themselves especially capable of predicting the outcomes of sports events. Indeed, our sample comprises regular sports bettors, 75% of whom identify as football experts. This may explain why they report subjective probabilities of winning that are higher under the sports framing than under the neutral framing despite identical underlying odds. One possibility is that such beliefs do turn out to be correct and result in higher winnings under the sports framing than under the neutral framing. This hypothesis is however rejected by the data. When we analyze winnings from the experiment, we find that subjects lose approximately the same amount, on average, under both framings. The average loss is 588 TSh under the sports framing and 504 TSh under the neutral framing (out of the initial endowment of 10,000 TSh), and the difference is not statistically significant.[29] Taken together, all these pieces of evidence point to bettors' overconfidence in their expertise as a leading channel behind our experimental results: being overly confident about their ability to predict the outcome of sports matches, bettors tend to have upward-biased winning expectations, which in turn leads to a systematic overvaluation of sports bets relative to neutral lotteries with the same fundamentals.

[28] Follow-up experiments may, for instance, exogenously manipulate the social dimension of sports betting by having in-person vs. remote bets, and by varying the chosen bets according to whether the game is/is not broadcast on TV.

[29] We compute these values as the difference between participants' average winnings and the initial endowment of 10,000 TSh in the choice arm under the two framings.

5.2 External Validity

This study offers novel insights that are of interest well beyond the context of our experiment. In order to corroborate the external validity of our findings, however, it is important to offer some reflections on how our experiment succeeds in replicating general features of sports betting that are common across the world, and in targeting the relevant population. In doing so, we follow List (2020), who highlights four elements that should be considered in assessing the external validity of experimental results: *selection*, *attrition*, *naturalness*, and *scaling*.

First, our *selection* strategy clearly achieves the objective of targeting the relevant population for a study on misperceptions among sports bettors. We recruit random subjects in the most natural setting for a study of this kind (i.e., betting shops). We select shops owned by major betting companies, whose customers are akin to gamblers from other parts of the world, including advanced economies. Indeed, the subjects in our sample (young males from a lower-income background) share similar characteristics with typical sports bettors in advanced economies (e.g., Gassmann et al., 2017; Costes et al., 2020; Williams et al., 2021). Second, *attrition* does not pose a challenge in our context. Virtually all invited subjects agreed to participate, and since the experiment took place immediately after recruitment, there is no attrition between the invitation and participation. Third, *naturalness* of the choice task, setting, and time-frame is attained in our study by setting up an experiment that exactly replicates real betting on real sports events (UK Premier League matches) in a natural location (the betting shop), and at a natural time of the day (just before the match).[30] The fourth and final factor, *scaling*, is a concern with limited applicability in our context since the core of our study does not entail an intervention that would be subject to major issues of scalability. It is nonetheless interesting to reflect on this issue. In particular, if one were to devise a de-biasing treatment based on our results, it would be necessary to think about the general equilibrium implications of lowering gamblers' expectations. We speculate that this

[30] One potentially interesting extension in this respect would consist of allowing participants to choose whether to bet at all. Analyzing this margin was not the focus of the current design since we worked with a population of regular bettors recruited in betting shops, but may constitute an interesting extension.

may decrease their willingness to gamble and may have repercussions on both betting companies' profits and on the prices they would offer for their products.

Overall, we conclude that our experimental design succeeds in replicating a natural context and in targeting the population of interest. This lends important support to the external validity of our conclusions.

6 Conclusions

The rapid spread of sports betting, especially among the most disadvantaged in society, is a growing cause of concern globally. This is the first study that experimentally investigates the drivers of sports betting through a rigorous comparison with general gambling and quantifies the premium that gamblers attach to betting on sports. We achieve this objective by devising a novel lab-in-the-field experiment among regular gamblers that contrasts betting on real sports events (UK Premier League football matches) with neutrally framed betting with identical odds.

We find that the certainty equivalent of a bet is, on average, higher when the bet is framed as a sports bet compared to an equivalent neutral urn-and-balls lottery. We also find that sports bets trigger a higher subjective probability of winning compared to neutral lotteries. In reality, bettors under the sports framing are no more likely to win. We also offer unique evidence on betting habits, which makes the experimental findings all the more compelling. Bettors bet frequently, they allocate a significant share of their income to this activity, and they view betting as a source of income (akin to a job) as opposed to a game.

Our evidence on misperceptions resonates with a growing literature documenting misaligned beliefs of economic agents and obstacles to belief-updating in a range of domains. In the context of sports betting, misperceptions may be particularly difficult to eradicate as they are intertwined with sports bettors' self-perceived ability to predict the outcomes of sports events. If overly confident, bettors may be excessively optimistic about their chances of winning and, as a result, over-bet and incur heavier financial losses.

As the sports betting industry grows and aggressively targets consumers (e.g., The New York Times, 2022), our conclusions offer valuable insights for policymakers. 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. Our results suggest that such an argument may be partial since the expectations on which bettors' assessments are based may be incorrect. We also offer suggestive evidence that the provision of more detailed information on the odds of a bet (odds training) may not improve bettors' assessment nor reduce their financial losses. Further work is necessary to identify effective strategies to make bettors aware of their potential misperceptions.

References

Abebe, G., S. Caria, M. Fafchamps, P. Falco, S. Franklin, and S. Quinn (2022). Matching frictions and distorted beliefs: evidence from a job fair experiment in Africa. *Unpublished manuscript*.

Abel, M., S. Cole, and B. Zia (2020). Changing gambling behavior through experiential learning. *The World Bank Economic Review 35*(3), 745–763.

Agenzia delle Accise, Dogane e Monopoli (2022). Note informative sulle probabilità di vincita. https://www.adm.gov.it/portale/monopoli/giochi/lotterie/lotterie_istantanee/lot_ist_note. Last accessed September 7, 2022.

Ali, M. M. (1977). Probability and utility estimates for racetrack bettors. *Journal of Political Economy 85*(4), 803–815.

AP News (2022). As sports betting grows in Africa, many see a real scourge. https://apnews.com/article/sports-africa-argentina-betting-uganda-a4ca722242be807cd12865043dbe773a. Last accessed April 10, 2023.

Bandiera, O., V. Bassi, R. Burgess, I. Rasul, M. Sulaiman, and A. Vitali (2023). The

search for good jobs: Evidence from a six-year field experiment in Uganda. Working Paper 31570, National Bureau of Economic Research.

Banerjee, A. and S. Sequeira (2023). Learning by searching: Spatial mismatches and imperfect information in southern labor markets. *Journal of Development Economics 164*, 103111.

Barber, B. M. and T. Odean (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics 116*(1), 261–292.

Barsbai, T., U. Schmidt, and U. Zirpel (2022). Overconfidence and risk taking in the field: Evidence from Ethiopian farmers. *Economic Development and Cultural Change 70*(3), 1065–1102.

Benabou, R. and J. Tirole (2002). Self-confidence and personal motivation. *The Quarterly Journal of Economics 117*(3), 871–915.

Björkman Nyqvist, M., L. Corno, D. de Walque, and J. Svensson (2018). Incentivizing safer sexual behavior: Evidence from a lottery experiment on hiv prevention. *American Economic Journal: Applied Economics 10*(3), 287–314.

Blumenstock, J. E. and M. Olckers (2021). Gamblers learn from experience. *Working paper* (arXiv:2011.00432).

Business Daily (2023). Bets plunge by sh240bn after betin, sportpesa crackdown. https://www.businessdailyafrica.com/bd/economy/bets-plunge-by-sh240bn-after-betin-sportpesa-crackdown--4182604. Last accessed April 10, 2023.

Cain, D. M., D. A. Moore, and U. Haran (2015). Making sense of overconfidence in market entry. *Strategic Management Journal 36*(1), 1–18.

Camerer, C. and D. Lovallo (1999). Overconfidence and excess entry: An experimental approach. *American Economic Review 89*(1), 306–318.

Caria, S. and P. Falco (2022). Sceptical employers: Experimental evidence on biased beliefs constraining firm growth. *The Review of Economics and Statistics*.

Chegere, M., P. Falco, M. Nieddu, L. Pandolfi, and M. Stein (2021). What drives sports betting? AEA RCT Registry. December 19. https://doi.org/10.1257/rct.8447-1.0.

Citizen (2021). The evolution of betting industry in Tanzania. https://www.thecitizen.co.tz/tanzania/news/business/tanzania-works/the-evolution-of-betting-industry-in-tanzania-2609608. Original article of October 20, 2017; updated on March 29, 2021. Last accessed April 10, 2023.

Clotfelter, C. T. and P. J. Cook (1991). *Selling Hope: State Lotteries in America*. Harvard University Press.

Cole, S., B. Iverson, and P. Tufano (2022). Can gambling increase savings? empirical evidence on prize-linked savings accounts. *Management science 68*(5), 3282–3308.

Conlisk, J. (1993). The utility of gambling. *Journal of Risk and Uncertainty 6*(3), 255–275.

Costes, J.-M., J.-B. Richard, V. Eroukmanoff, O. L. Nézet, and A. Philippon (2020). Les Francais et les jeux d'argent et de hasard. Résultats du Baromètre de Santé publique France 2019. Tendances n° 138.

Crossley, T. F., H. Low, and S. Smith (2016). Do consumers gamble to convexify? *Journal of Economic Behavior & Organization 131*, 276–291.

Daniel, K. and D. Hirshleifer (2015). Overconfident investors, predictable returns, and excessive trading. *Journal of Economic Perspectives 29*(4), 61–88.

Della Vigna, S. and U. Malmendier (2006). Paying not to go to the gym. *American Economic Review 96*(3), 694–719.

Dizon, F. and T. J. Lybbert (2021). Leveraging the lottery for financial inclusion: Lotto-linked savings accounts in haiti. *Economic Development and Cultural Change 69*(4).

Donkor, K., L. Goette, M. W. Müller, E. Dimant, and M. Kurschilgen (2023). Identity and economic incentives. Working Paper 10860, CESifo.

DW (2017). Sports betting fever grips Africa. https://www.dw.com/en/sports-betting-fever-grips-africa/a-37502606.

Eil, D. and J. M. Rao (2011). The good news-bad news effect: Asymmetric processing of objective information about yourself. *American Economic Journal: Microeconomics 3*(2), 114–138.

Friedman, M. and L. J. Savage (1948). The utility analysis of choices involving risk. *Journal of Political Economy 56*(4), 279–304.

FSGA (2022). Fantasy Sports & Gaming Association: Records broken in legal sports wagering and fantasy sports participation. https://thefsga.org/records-broken-in-legal-sports-wagering-and-fantasy-sports-participation/.

Gaming Board of Tanzania (2021). Annual report 2019/20. https://www.gamingboard.go.tz/uploads/documents/sw-1667540488-2019-20%20GBT%20REPORT.pdf. Last accessed April 10, 2023.

Gaming Board of Tanzania (2022). Restriction on advertisement of gaming activities in tanzania. https://www.gamingboard.go.tz/news/restriction-on-advertisement-of-gaming-activities-in-tanzania. Original article dated February 6, 2019; published online on June 1, 2022. Last accessed April 10, 2023.

Garrett, T. A. and R. S. Sobel (1999). Gamblers favor skewness, not risk: Further evidence from United States' lottery games. *Economics Letters 63*(1), 85–90.

Gassmann, F., E. Emrich, and C. Pierdzioch (2017). Who bets on sports? Some further empirical evidence using German data. *International Review for the Sociology of Sport 52*(4), 391–410.

Gilovich, T., R. Vallone, and A. Tversky (1985). The hot hand in basketball: On the misperception of random sequences. *Cognitive Psychology 17*(3), 295–314.

Grossman, P. J. and C. C. Eckel (2015). Loving the long shot: Risk taking with skewed lotteries. *Journal of Risk and Uncertainty 51*(3), 195–217.

Grubb, M. D. (2015). Overconfident consumers in the marketplace. *Journal of Economic Perspectives 29*(4), 9–36.

Habibu, N. A., I. F. Iramba, and Y. Kambuga (2020). The prevalence of sports betting in tanzania secondary school students. *Journal La Edusci 1*(3), 23–32.

Haisley, E., R. Mostafa, and G. Loewenstein (2008). Myopic risk-seeking: The impact of narrow decision bracketing on lottery play. *Journal of Risk and Uncertainty 37*, 57–75.

Herskowitz, S. (2021). Gambling, saving, and lumpy liquidity needs. *American Economic Journal: Applied Economics 13*(1), 72–104.

Jensen, R. (2010). The (perceived) returns to education and the demand for schooling. *The Quarterly Journal of Economics 125*(2), 515–548.

Le Menestrel, M. (2001). A process approach to the utility for gambling. *Theory and Decision 50*(3), 249–262.

Levitt, S. D. (2004). Why are gambling markets organised so differently from financial markets? *The Economic Journal 114*(495), 223–246.

List, J. A. (2020). Non est disputandum de generalizability? a glimpse into the external validity trial. Working Paper 27535, National Bureau of Economic Research.

Malmendier, U. and G. Tate (2015). Behavioral CEOs: The role of managerial overconfidence. *Journal of Economic Perspectives 29*(4), 37–60.

Menkhoff, L., M. Schmeling, and U. Schmidt (2013). Overconfidence, experience, and professionalism: An experimental study. *Journal of Economic Behavior & Organization 86*, 92–101.

Michailova, J. and U. Schmidt (2016). Overconfidence and bubbles in experimental asset markets. *Journal of Behavioral Finance 17*(3), 280–292.

Miller, J. B. and A. Sanjurjo (2017). A visible (hot) hand? expert players bet on the hot hand and win. Working paper, Available at SSRN: https://ssrn.com/abstract=3032826.

Miller, J. B. and A. Sanjurjo (2018). Surprised by the hot hand fallacy? a truth in the law of small numbers. *Econometrica 86*(6), 2019–2047.

Miller, J. B. and A. Sanjurjo (2021). Is it a fallacy to believe in the hot hand in the nba three-point contest? *European Economic Review 138*, 103771.

Möbius, M. M., M. Niederle, P. Niehaus, and T. S. Rosenblat (2022). Managing self-confidence: Theory and experimental evidence. *Management Science*.

Polaris (2022). Polaris Market Research: Sports betting market share, size, trends, industry analysis report. https://www.polarismarketresearch.com/industry-analysis/sports-betting-market. Last accessed September 7, 2022.

Sandroni, A. and F. Squintani (2013). Overconfidence and asymmetric information: The case of insurance. *Journal of Economic Behavior & Organization 93*, 149–165.

Seither, J. (2021). Keeping up with the joneses: economic impacts of overconfidence in micro-entrepreneurs. Working paper, Available at SSRN: https://ssrn.com/abstract=3825971.

Snowberg, E. and J. Wolfers (2010). Explaining the favorite-long shot bias: Is it risk-love or misperceptions? *Journal of Political Economy 118*(4), 723â–746.

Tanzania National Bureau of Statistics (2021). Integrated labour force survey 2020/21: Key labour market indicators for the united republic of Tanzania. https://www.nbs.go.tz/nbs/takwimu/labour/KILM_with_Policy_Brief%202020_21_ILFS%20English.pdf. Last accessed December 20, 2022.

The Guardian (2021). People from poor UK areas more likely to be high-risk online gamblers - study. https://www.theguardian.com/society/2021/mar/12/people-from-poor-uk-areas-more-likely-to-be-high-risk-online-gamblers-study. Last accessed September 7, 2022.

The New York Times (2022). Key findings from The Times' investigation of sports betting. https://www.nytimes.com/2022/11/20/business/sports-betting-investigation.html. Last accessed November 20, 2022.

UK Gambling Commission (2020). Information to lottery players: Proceeds and prizes. Guidance note. https://www.gamblingcommission.gov.uk/licensees-and-businesses/guide/information-to-lottery-players-proceeds-and-prizes#1gHGAsyUhJAjQ79Qp4oDNw. Last accessed September 7, 2022.

Williams, L. V. and D. S. Siegel (2013). *The Oxford handbook of the economics of gambling*. Oxford University Press.

Williams, R. J. and D. Connolly (2006). Does learning about the mathematics of gambling change gambling behavior? *Psychology of Addictive Behaviors 20*(1), 62–68.

Williams, R. J., C. A. Leonard, Y. D. Belanger, D. R. Christensen, N. el-Guebaly, D. C. Hodgins, D. S. McGrath, F. Nicoll, G. J. Smith, and R. M. G. Stevens (2021). Predictors of gambling and problem gambling in Canada. *Canadian Journal of Public Health 112*(3), 521–529.

World Bank (2022). Tanzania national panel survey 2019-2020 - extended panel with sex disaggregated data (nps 2019-2020). https://microdata.worldbank.org/index.php/catalog/3885. Last accessed September 7, 2022.

Zenker, J., A. Wagener, and S. Vollmer (2016). Better knowledge need not affect behavior: A randomized evaluation of the demand for lottery tickets in rural Thailand. *The World Bank Economic Review 32*(3), 570–583.

Appendix - For Online Publication

Table A1: Balance

	(1) Group A mean/sd	(2) Group B mean/sd	(3) Group C mean/sd	(4) Group D mean/sd	(5) (1)-(2) b/t	(6) (3)-(4) b/t	(7) (1)-(3) b/t	(8) (2)-(4) b/t
Age	31.82	31.44	33.14	32.88	0.38	0.26	-1.32	-1.45
	(8.41)	(8.47)	(9.28)	(9.09)	(0.50)	(0.22)	(-1.36)	(-1.50)
Self-assessed football expert	0.78	0.72	0.72	0.79	0.06	-0.07	0.06	-0.08
	(0.42)	(0.45)	(0.45)	(0.41)	(1.58)	(-1.28)	(1.15)	(-1.60)
Education: None	0.04	0.02	0.05	0.02	0.01	0.03	-0.01	-0.00
	(0.19)	(0.15)	(0.22)	(0.16)	(0.81)	(1.06)	(-0.62)	(-0.02)
Education: Primary	0.37	0.44	0.47	0.42	-0.07	0.05	-0.10	0.02
	(0.48)	(0.50)	(0.50)	(0.50)	(-1.64)	(0.82)	(-1.90)	(0.39)
Education: Secondary (4 yrs)	0.43	0.42	0.41	0.45	0.01	-0.05	0.02	-0.04
	(0.50)	(0.49)	(0.49)	(0.50)	(0.21)	(-0.74)	(0.38)	(-0.65)
Education: Secondary (6 yrs) or univ.	0.16	0.11	0.07	0.10	0.05	-0.03	0.10*	0.01
	(0.37)	(0.32)	(0.25)	(0.30)	(1.62)	(-0.87)	(2.56)	(0.42)
Lives with 4+ family members	0.57	0.57	0.50	0.54	0.00	-0.04	0.07	0.03
	(0.50)	(0.50)	(0.50)	(0.50)	(0.06)	(-0.64)	(1.29)	(0.50)
Monthly family income <50k TSh	0.26	0.27	0.34	0.21	-0.02	0.13*	-0.08	0.07
	(0.44)	(0.45)	(0.47)	(0.41)	(-0.43)	(2.27)	(-1.61)	(1.37)
Monthly family income 50k-200k TSh	0.40	0.40	0.47	0.50	0.00	-0.03	-0.07	-0.10
	(0.49)	(0.49)	(0.50)	(0.50)	(0.02)	(-0.52)	(-1.22)	(-1.85)
Monthly family income 200k-500k TSh	0.26	0.23	0.15	0.21	0.02	-0.06	0.10*	0.02
	(0.44)	(0.42)	(0.36)	(0.41)	(0.60)	(-1.27)	(2.25)	(0.36)
Monthly family income >500k TSh	0.09	0.09	0.04	0.07	-0.01	-0.03	0.04	0.02
	(0.28)	(0.29)	(0.20)	(0.26)	(-0.27)	(-1.07)	(1.54)	(0.61)
Self-employed	0.61	0.58	0.62	0.58	0.03	0.04	-0.01	0.00
	(0.49)	(0.49)	(0.49)	(0.50)	(0.62)	(0.68)	(-0.23)	(0.05)
Employed (worker)	0.24	0.28	0.27	0.26	-0.04	0.01	-0.03	0.02
	(0.43)	(0.45)	(0.45)	(0.44)	(-1.05)	(0.22)	(-0.62)	(0.49)
Unemployed	0.15	0.14	0.11	0.17	0.01	-0.06	0.04	-0.03
	(0.36)	(0.35)	(0.31)	(0.37)	(0.44)	(-1.26)	(1.11)	(-0.69)
Wage frequency daily	0.74	0.65	0.71	0.72	0.09	-0.00	0.03	-0.07
	(0.44)	(0.48)	(0.46)	(0.45)	(1.94)	(-0.07)	(0.52)	(-1.12)
Daily wage >10k TSh	0.52	0.57	0.58	0.63	-0.05	-0.05	-0.06	-0.06
	(0.50)	(0.50)	(0.50)	(0.49)	(-0.75)	(-0.63)	(-0.76)	(-0.86)
Monthly wage >150k TSh	0.69	0.61	0.57	0.74	0.07	-0.17	0.11	-0.13
	(0.47)	(0.49)	(0.50)	(0.45)	(0.81)	(-1.32)	(1.01)	(-1.17)
Monthly wage >300k TSh	0.25	0.27	0.25	0.22	-0.02	0.03	0.00	0.05
	(0.44)	(0.45)	(0.44)	(0.42)	(-0.20)	(0.24)	(0.05)	(0.49)
Sector: Agriculture, forestry, fishing	0.07	0.06	0.08	0.07	0.02	0.02	-0.01	-0.01
	(0.26)	(0.23)	(0.28)	(0.26)	(0.67)	(0.42)	(-0.38)	(-0.44)
Sector: Manuf., motor, constr., transp.	0.27	0.31	0.38	0.30	-0.04	0.08	-0.11*	0.01
	(0.44)	(0.46)	(0.49)	(0.46)	(-0.89)	(1.22)	(-2.01)	(0.17)
Sector: Retail, wholes., accomm., food	0.27	0.29	0.21	0.34	-0.02	-0.13*	0.06	-0.05
	(0.44)	(0.45)	(0.41)	(0.47)	(-0.47)	(-2.10)	(1.15)	(-0.88)
Sector: White collar	0.09	0.06	0.08	0.07	0.03	0.02	0.00	-0.01
	(0.28)	(0.23)	(0.28)	(0.26)	(1.22)	(0.42)	(0.07)	(-0.44)
Sector: Other	0.31	0.29	0.25	0.23	0.01	0.02	0.06	0.06
	(0.46)	(0.46)	(0.43)	(0.42)	(0.30)	(0.30)	(1.12)	(1.20)
Observations	243	246	119	121	489	240	362	367

NOTES.: This table shows balance tests for a range of participant characteristics across the four experimental groups. Group A is "Sports-betting, choice", Group B is "Sports-betting, no-choice", Group C is "Lottery, choice", and Group D is "Lottery, no-choice".

Table A2: Summary statistics on betting behavior

	mean	sd	min	max
Bets on sports every day; dummy=0 if less frequently	0.60	0.49	0.00	1.00
Bets on sports every day or several times a week	0.94	0.25	0.00	1.00
Avg single bet above 1k Tsh	0.54	0.50	0.00	1.00
Amount spent on SB last 2 wks (in 1000 Tsh)	40.27	160.16	0.00	4000.00
Number of SB last 2 wks	7.19	3.19	0.00	10.00
Spent less than usual past 2 wks	1.00	0.00	1.00	1.00
Amount won with SB last 2 wks (gross) (in 1000 Tsh)	108.21	762.68	0.00	20000.00
Amount won with SB last 2 wks (gross, noout) (in 1000 Tsh)	80.89	193.56	0.00	3000.00
Net amount won with SB last 2 wks (in 1000 Tsh)	67.95	774.35	-3974.00	19900.00
Net amount won with SB last 2 wks (noout) (in 1000 Tsh)	40.70	242.28	-3974.00	2700.00
Lost money with SB last 2 wks	0.49	0.50	0.00	1.00
Won 50k or more with SB last 2 wks	0.25	0.43	0.00	1.00
Feels sometimes bets more than should	0.57	0.49	0.00	1.00
Largest amount won above 250k Tsh	0.41	0.49	0.00	1.00
Largest amount heard of above 5mio Tsh	0.50	0.50	0.00	1.00
Reason bets: make money	0.88	0.33	0.00	1.00
Reason bets: for fun	0.11	0.32	0.00	1.00
Reason bets: watch game	0.05	0.21	0.00	1.00
Reason bets: friends do it	0.02	0.14	0.00	1.00
Reason bets: other	0.01	0.09	0.00	1.00
SB reliable income source==Not at all	0.24	0.43	0.00	1.00
SB reliable income source==Only a little	0.14	0.35	0.00	1.00
SB reliable income source==To some extent	0.43	0.49	0.00	1.00
SB reliable income source==Yes, absolutely	0.19	0.39	0.00	1.00
SB reliable income source (some ext,absol)	0.61	0.49	0.00	1.00
Use of winnings: save	0.09	0.29	0.00	1.00
Use of winnings: special purchases	0.32	0.47	0.00	1.00
Use of winnings: daily expenses	0.63	0.48	0.00	1.00
Use of winnings: bet again	0.09	0.28	0.00	1.00
Use of winnings: go out	0.02	0.14	0.00	1.00
Use of winnings: business invest	0.02	0.15	0.00	1.00
Use of winnings: other	0.02	0.14	0.00	1.00
Observations	729			

Table A3: Alternative measure of perceived probability of winning

	(1) Choice	(2) No choice	(3) Choice condit.
Sports Bet	6.68***	7.21***	4.93*
	(2.39)	(2.70)	(2.90)
Day-by-outcome FE	No	No	Yes
Mean dep. var (Neutral Lottery)	78.14	75.37	78.14
Std. dev. dep. var	21.21	24.69	21.21
Observations	361	367	361
R-squared	0.062	0.063	0.124

NOTES.: This table reports the estimated effect of the sports bet framing on an alternative measure of the participants' perceived probability of winning. This is defined as the answer to the question "How likely do you think it is you will win your bet on a scale from 0 to 100?". In all columns, Sports Bet is a dummy variable that equals one if an individual receives the sports bet and 0 if s/he receives the neutral lottery. All columns include controls for participants' age, education, income, and self-assessed football knowledge; Column 1 and 2 also include day fixed effects, while Column 3 includes day×outcome fixed effects. Column 1 and 3 consider only participants in the choice arm, who can choose the outcome to bet on. Column 2 considers participants in the no-choice arm, who were given a ticket for an already-placed bet. Coefficients in all columns are estimated through OLS. Robust standard errors in parentheses.

Table A4: Heterogeneous Impacts

	Choice				No choice			
	(1)		(2)		(3)		(4)	
	CE		Prob. win		CE		Prob. win	
Sports Bet	2038.17	(1265.09)	21.46***	(3.00)	3237.34**	(1460.47)	15.21***	(3.80)
$\geq$ median income	-818.02	(1660.68)	-0.52	(2.86)	-1010.67	(1635.11)	4.01	(3.30)
Sports Bet $\times \geq$ median income	-813.99	(1892.36)	-9.70**	(4.22)	-742.11	(1948.17)	-1.35	(4.80)
Sports Bet	2839.98**	(1366.62)	14.46***	(2.70)	1528.92	(1532.77)	16.43***	(3.31)
Secondary educ. or higher	2014.78	(1613.60)	2.01	(2.93)	-915.81	(1669.68)	3.10	(3.26)
Sports Bet $\times$ Secondary educ. or higher	-2727.55	(1871.93)	1.95	(4.20)	2224.85	(1988.54)	-3.17	(4.55)
Sports Bet	2646.94	(1844.21)	18.69***	(3.84)	2511.65	(2431.24)	14.64***	(5.20)
Football expert	2130.55	(1838.44)	2.49	(2.77)	-109.39	(2386.37)	-4.01	(4.35)
Sports Bet $\times$ Football expert	-1697.66	(2150.99)	-3.82	(4.63)	381.75	(2650.17)	-0.40	(5.81)
Sports Bet	2639.75*	(1517.21)	16.52***	(3.36)	5148.42***	(1544.08)	12.07***	(3.81)
Bets every day	2801.97*	(1682.26)	-0.99	(3.09)	2588.20	(1669.91)	-2.66	(3.44)
Sports Bet $\times$ Bets every day	-1951.90	(1933.72)	-1.31	(4.31)	-3855.92**	(1956.99)	4.15	(4.80)
Sports Bet	1775.69	(1086.36)	14.86***	(2.38)	2987.53***	(1127.56)	14.94***	(2.61)
Won 50K or more last two weeks	1526.66	(1962.38)	-0.99	(3.24)	-616.72	(1851.77)	-4.28	(3.58)
Sports Bet $\times$ Won 50K or more last two weeks	-1314.43	(2243.42)	4.09	(4.67)	-740.08	(2216.53)	-1.24	(5.60)
Sports Bet	1203.58	(989.79)	15.17***	(2.14)	2771.60***	(1044.86)	14.43***	(2.61)
Bet for fun	-3326.17	(2791.36)	-7.49	(4.81)	256.38	(2468.13)	-1.05	(3.49)
Sports Bet $\times$ Bet for fun	2191.73	(3196.82)	5.55	(6.65)	127.10	(2785.41)	1.51	(5.50)

NOTES.: This table shows impact heterogeneity for the sports framing treatment along a set of participants' characteristics and indicators of betting habits. The individual characteristics considered are an indicator equal to one if the income is higher than the sample median, an indicator equal to one for secondary education or higher. The variables capturing betting habits are a set of binary indicators equal to one if a participant defines himself/herself as a football expert, if s/he bets every day, if s/he won more than 50,000 TSh in the two weeks before the experiment, if s/he reports to bet for fun or to watch the games with friends. In Column 1 and 3 the dependent variable is the certainty equivalent, defined as the amount at which an individual starts preferring to sell the sports bet (or the lottery ticket) and receive that amount with certainty rather than keeping the ticket. In Columns 2 and 4, the dependent variable is the answer to the question "What do you think are the chances (in percentages) that each of the following events will happen?", where events are either the colors of the balls or the outcomes of the football match (1, X or 2), re-scaled by the sum of the three likelihoods stated. In Columns 1 and 2 the sample considers only participants in the choice arm, while in Columns 3 and 4 it considers participants in the no-choice arm. All columns include day fixed effects. Coefficients in all columns are estimated through OLS. Robust standard errors in parentheses.

Table A5: Information Treatment

	Certainty Equivalent		Perceived probability
	(1)	(2)	(3)
	OLS	Tobit	OLS
Info	-225.41	-665.44	-3.61
	(706.09)	(1441.96)	(2.28)
Mean dep. var (No info)	14786.32	14786.32	60.14
Std. dev. dep. var	7271.35	7271.35	25.03
Observations	458	458	489
R-squared	0.051		0.086

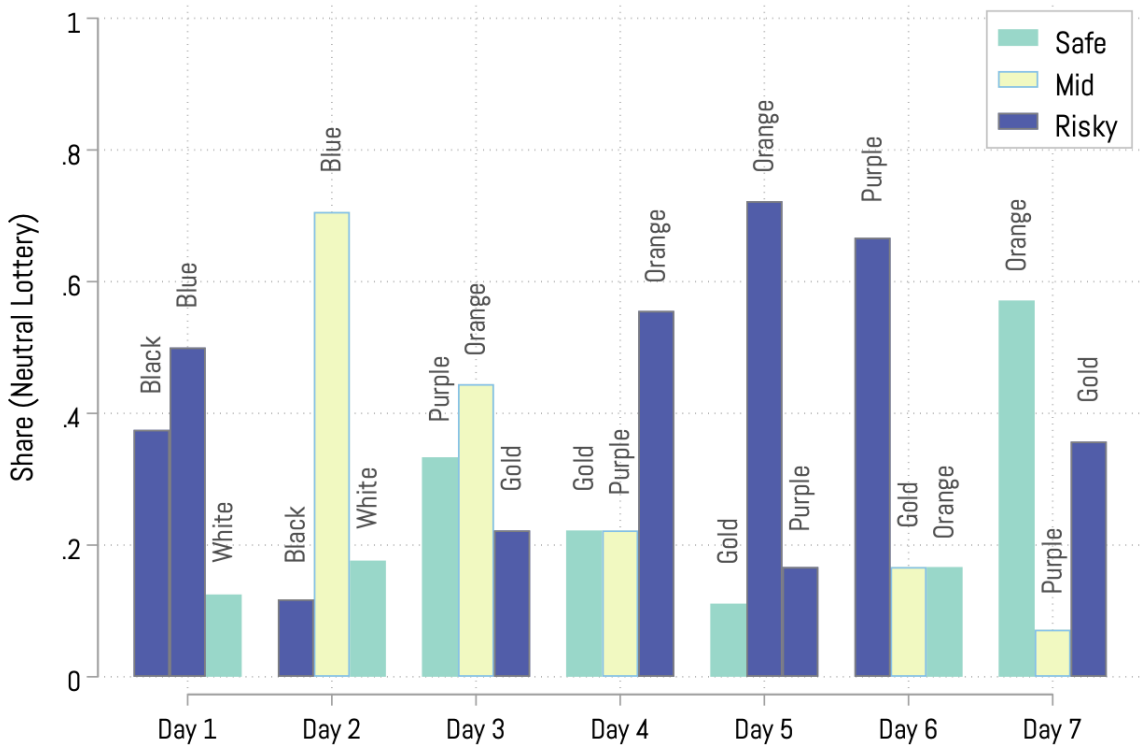
NOTES.: This table reports the estimated effect of the information treatment on the certainty equivalent and participants' perceived probability of winning. In Column 1 and 2, the dependent variable is defined as the amount at which an individual starts preferring to sell the sports bet (or the lottery ticket) and receive that amount with certainty rather than keeping the ticket. In Column 3, it is the answer to the question "What do you think are the chances (in percentages) that each of the following events will happen?", where events are either the colors of the balls or the outcomes of the football match (1, X, or 2), re-scaled by the sum of the three likelihoods stated. Info is a dummy variable that equals one if an individual receives the information treatment, and 0 otherwise. In all columns, the sample pools together participants in the choice and no-choice arm. All columns include an indicator that equals one if an individual is in the choice arm, day fixed effects, and controls for participants' age, education, income, and self-assessed football knowledge. Coefficients in Column 1 and 3 are estimated by OLS, while the ones in Column 2 are obtained from a Tobit model that accounts for the upper limit on the certain amount offered to participants (20,000 TSh). Robust standard errors in parentheses.

Table A6: Heterogeneous impacts by difference in bets b/n choice and no-choice arm

	(1) OLS	(2) OLS
Choice arm	-2138.7	-2122.2
	(2076.0)	(2071.9)
Choice arm × Disagreement	9724.1	9688.6
	(6090.3)	(6088.6)
Day FE	No	Yes
Mean dep. var (No choice)	14184.21	14184.21
Std. dev. dep. var	7700.41	7700.41
Observations	458	458
R-squared	0.009	0.030

NOTES: This table reports heterogeneous impacts of the sports framing on certainty equivalents by the difference (degree of disagreement) between the bets made by subjects in the choice arm and those pre-fixed in the no-choice arm. In all columns, the dependent variable is the certainty equivalent of the bet, defined as the amount at which an individual starts preferring to sell the sports bet (or the lottery ticket) and receiving that amount with certainty rather than keeping the ticket. The sample considers only participants in the sports bet group. *Choice arm* is a dummy variable that equals one if the participant is in the choice arm of the experiment (i.e., has the possibility to choose the outcome to bet on). *Disagreement* is the share of participants in the choice arm who choose to bet on an outcome that *differs* from the one we choose for the pre-fixed bet in the no-choice arm. This share ranges from a minimum of 21% (day 7) to a maximum of 56% (day 3). Coefficients in both column 1 and 2 are estimated by OLS. Robust standard errors in parentheses.

Figure A1: Participants' betting choices in the neutral lottery



NOTES. This figure depicts, for each day of the experiment, the share of participants in the choice arm of the neutral lottery group who chose to bet on each of the possible outcomes. The most likely (safest) outcome according to the likelihood is colored in light blue. The second most likely outcome is colored in yellow. The least likely outcome (riskiest) is colored in dark blue. Two bars have the same color when the two riskier outcomes are equally likely. In the no-choice arm, the pre-fixed bet is always on the most likely (safest) outcome.