CBEAR | THE CENTER FOR Behavioral & Experimental Agri-Environmental Research

Overweighting Small Chances

Leveraging Randomness to Boost Participation

Background

For many of us, unlikely events can seem more likely than they are. This perception can explain why some people purchase insurance and also gamble. Insurance reduces risks to wealth -- while gambling increases them. Interestingly, we can attribute both of these behaviors to an individual's distorted perception of their actual chances.

Since most people perceive an unrealistic assessment of situations involving uncertainty, lotteries can boost the subjective monetary value of a reward.

For example, take a lottery that pays out a million dollars with a one-in-a-million chance. The (expected) value of this lottery is $1. However, suppose people overestimate their chances by perceiving their ''winning numbers'' to have a one-in-a-hundred- thousand chance of winning. In that case, their (subjective) value is ten times higher at $10. Policymakers can leverage these perceptions. Instead of paying $1 to a million individuals, they could give each $10 in value by offering each an equal chance at a million dollars or a one-in-a- million chance, at no additional cost.

Many studies have found evidence that people tend to overweigh small chances when assessing the value of lotteries. Participants in these paid research studies appear willing to exchange small chances for higher monetary payments, particularly at more unfavorable odds. Figure 1 shows how this perceived value may grow at lower probabilities.
Hence, policymakers can use lotteries to bolster behavioral incentives. For example, they can offer a slight chance of a large cash prize instead of guaranteed payments. Further, informational treatments centered around making the odds more salient than the payouts can also be effective.

In agriculture, crop insurance contracts are often framed as investments rather than risk mitigation tools. The evidence suggests that emphasizing risks can increase insurance take-up.

Success Story

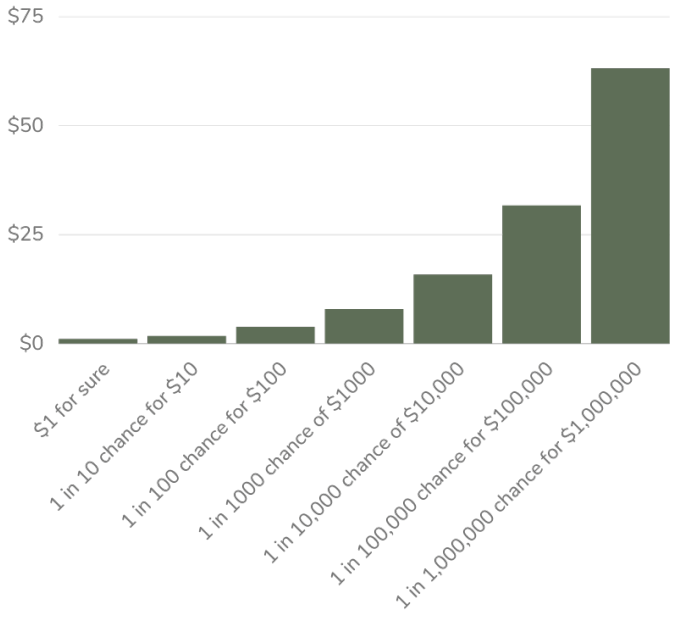
Several states used lotteries to incentivize individuals to get the COVID-19 vaccine. Given Ohio's million-dollar lottery initial success, several states (AR, CA, DE, MD, and OR) adopted similar schemes. Lotteries have additional advantages beyond increasing incentives at no extra cost:

• Once-in-a-lifetime prizes can be targeted to specific groups by offering opportunities like a permanent hunting license or free college.

•Advertising winners can leverage the regret non-participants feel and generate additional enrollments.

•Paying the “lucky” few can be easier from an administrative perspective.

Perceived Values for Different Lotteries with the Same Perceived Cost ($1)



Application Ideas

Public monitoring programs: Lotteries can be used as compensation for programs that require active participation. For example, when determining agricultural producers' water use or fertilizer applications via self-reports. These incentives may contribute to better and more prolonged engagement and better data.

Prevented planting insurance programs: The lack of take-up of crop insurance can be problematic. Already, several incentives and nudges are used to increase take-up. Often only informational approaches are feasible. Even in this case, emphasizing risks, as opposed to outcomes, can be a more effective policy for under- insured groups.

Conservation programs: The USDA's conservation reserve program has successfully aligned public environmental concerns and private financial interests. This program is often updated and incentive schemes tested. One new approach could test using lotteries as incentives for the amount of sequestered carbon. An intervention like this can complement existing programs and increase the number of effective acres.

Design Tips

When evaluating the perception boosts that lotteries can offer, several factors may affect their perceived values:

1. Subjective valuations of lotteries can be heterogeneous across individuals. Different people may react differently.

2. People may equate their chance to zero for low enough odds limiting the boost from lotteries.

3. Response to incentives may be driven by context and what aspect of the lottery is emphasized. For example, medical and non- medical attitudes towards risk may differ, and emphasizing chances or prizes plays a role.

Testing Ideas

Testing can inform behavioral changes, cost-savings, and program effectiveness when designing lottery incentives. Different lottery designs can be rigorously tested using randomized controlled trials. By testing, we can inform evidence-based programs with more engagement, satisfaction and help improve environmental outcomes.

For references and more information about Overweighting Small Chances Leveraging Randomness To Boost Participation (BehavioralInsights Brief no. 11), visit www.centerbear.org or email CBEAR co-Directors, Paul Ferraro (pferraro@jhu.edu) and Kent Messer (messer@udel.edu).

Funded by USDA, CBEAR is a consortium of major research universities that uses the most modern science and methods to improve agri-environmental programs.