Saving for a Rainy Day: Experimental Evidence on Prize-Linked Saving and Financial Shocks *

Kaden Grace[†‡]

This Version: December 2, 2025

Abstract

Liquidity constraints and inadequate precautionary savings create substantial financial vulnerability for low-income households who face costly or inaccessible credit markets when unexpected expenses arise. This paper presents a laboratory experiment integrating a dynamic life-cycle savings model with prize-linked savings accounts (PLSAs, which offer lottery-style prizes in lieu of guaranteed interest) to investigate whether the behaviorally-motivated intervention can increase savings under financial uncertainty. I find that PLSAs crowd-out traditional savings accounts by 38.5 to 33.6 percent. Total savings does not increase. This portfolio reallocation imposes costs: participants lose 9.1 to 17.8 percent of potential earnings by forgoing compound interest, with the largest effects concentrated among risk-seeking individuals who exhibit 93.7 percent crowding-out. PLSAs function primarily as portfolio substitutes rather than savings-creation tools. Heterogeneity across customer risk preferences suggests that PLSAs may be most attractive to risk-seeking households.

*I am grateful for comments from participants at the annual meeting of the Southern Economic Association. All remaining errors are my own.

[†]University of Tennessee - Knoxville

[‡]Direct correspondence to Kaden Grace, Department of Economics, University of Tennessee, Knoxville, TN 37996. E-mail: kgrace7@vols.utk.edu. This paper reports research involving the collection of data on human participants. Approval from the University of Tennessee Institutional Review Board was obtained, as protocol UTK IRB-23-07883-XM. Funding was provided by the J. Fred Holly Chair of Excellence endowment.

1 Introduction

Nearly two out of five U.S. adults report they would be unable to access $2,000 in the next month if faced with an unexpected need like a car accident or a trip to the emergency room (New York Fed, 2025).These liquidity constraints can bind households into suboptimal financial decisions like liquidating long-term investments at low prices, reducing consumption, or taking on high-interest debt (including credit cards, payday loans, and buy-now-pay-later agreements). While these alternatives are better than default, they are a clear second best to saving from a long run optimization perspective.

Liquidity constraints are directly linked to inadequate household savings. This problem can partially be addressed by credit markets where households take on debt during downturns to smooth their consumption. Limited access to credit, poor credit ratings, high interest rates, and predatory lending practices can make credit very costly. [1] Why, then, do some households fail to build adequate precautionary savings? In a canonical economics model of consumption, there are several primitives that can lead to inadequate saving: high discount rates, low levels of risk aversion, serially correlated shocks, external income constraints, lack of financial literacy, and debt aversion.

Interventions from policymakers and the market have attempted to both address and capitalize on inadequate saving. Apps such as Acorns encourage savings by rounding up every purchase made on the paying subscriber's debit or credit card to the next dollar. Behavioral "nudges" proposed by Thaler and Sunstein (2009) include automatically opting workers into retirement savings accounts. A recent and widely accepted behavioral intervention is the prize-linked savings account (PLSA). PLSAs make saving more engaging by offering consumers lottery-style prizes instead of interest earnings. Deposits in a PLSA function as recurring lottery tickets that offer returns from a skewed distribution where median earnings

[1] For example, Tennessee passed the Flexible Credit Act in 2015 allowing Flex Loans that offer credit-constrained households up to $4,000 at 279.5 percent interest. Previous regulations capped payday lending to a total of $425 at 24 percent interest. (Tenn. Code Ann. § 45-12-111). Advance Financial, the largest lender of Flex Loans, has sued over 110,000 Tennesseeans for unpaid Flex Loans since 2015 (Friedman, 2025).

are zero and any return comes only from winning the prize. Unlike a lottery ticket, the account holder does not lose their principal if they do not win the prize. PLSAs would appeal most to individuals with a high discount rate and low risk aversion, and this is the exact type of individual who is most likely to inadequately save.

Ex-ante, the overall effect of access to a PLSA on liquidity constrained households is ambiguous. Households may choose to invest money in the PLSA, but this investment could come from a reallocation of existing savings. crowd out savings in traditional accounts. It is possible that households do not increase total savings at all. Substitution away from traditional interest-bearing accounts into a stochastic PLSA could even decrease a household's well-being by causing the household to lose out on the steady compound returns of traditional saving.

This paper develops a laboratory experiment to evaluate PLSAs as an intervention for building precautionary saving. I utilize a dynamic life-cycle savings model to analyze the portfolio choices of credit-constrained participants who are offered a high-yield savings account (sixteen percent) and an account with lottery-style returns. The experimental design allows random assignment of financial shocks and access to savings mechanisms while observing complete portfolio choices. I test whether access to different savings products cause participants to achieve dynamically efficient consumption and savings behavior. I separately evaluate participants by their elicited risk aversion level to understand how PLSAs can appeal to and affect different types of households.

I find that access to a prize-linked savings account does not increase total precautionary saving but does cause participants to reduce their traditional savings by 38.5 to 33.6 percent, depending on the prize size. Individuals with access to a PLSA earn 9.1 to 17.8 percent less over the course of the experiment because they forego compound interest. This suggests the utility participants derive from entertainment is at least as great as the value of the foregone returns. Substitution from traditional to prize-linked savings is most pronounced among risk-seeking participants, who reduce traditional savings by 93.7 percent. Risk-averse participants

reduce traditional savings by 40.3 to 30.4 percent. Total savings do not significantly increase for any risk category of participant.

Previous work using laboratory experiments on liquidity constraints have established that participants systematically under-save when facing uncertainty and borrowing constraints (Brown et al., 2009; Ballinger et al., 2011; Duffy and Orland, 2025; Carbone and Hey, 2004; Hey and Dardanoni, 1988). Meissner (2016) identified debt aversion as a key behavioral factor, showing that participants are more reluctant to borrow than save when smoothing consumption. Jindapon et al. (2022), Filiz-Ozbay et al. (2015), and Atalay et al. (2014) conduct laboratory experiments confirming that PLSAs act as substitutes for both standard savings accounts and lotteries, with participants responding positively to higher PLSA returns. Field experiments find that introducing a PLSA increases total savings, especially among those households that were previously unbanked. Maynard et al. (2008) partner with a credit union to find that American demand for PLSAs is high and generally unresponsive to changes in the expected return of other savings products. Gertler et al. (2023) offer a PLSA in 110 bank branches across Mexico and observe that the accounts are still used long after the bank discontinued prizes and converted the accounts to standard savings. Dizon and Lybbert (2021) offer a lottery-linked savings account in Haiti and find that participants' total savings increase by 30 percent.[2] A comprehensive survey by Kearney et al. (2010) documents the global expansion of PLSAs.

This paper contributes by evaluating PLSAs as an intervention for building precautionary savings. PLSAs may be an effective policy tool for unbanked households with no existing savings accounts. Households that are already banked may substitute savings away from traditional savings accounts even if those accounts pay a high yield. This substitution shows the strong draw of PLSAs and the utility that households may receive from the lottery-style reward of saving in a PLSA. Financial institutions and governments who are considering

[2]A lottery-linked savings account returns a percentage of the principal, usually between 60 percent and 100 percent. A PLSA is a particular case of a lottery-linked savings account that pays 100 percent of the principal.

offering PLSAs should know that households may choose to invest in a PLSA instead of a high-yield savings account, which could increase revenue for the financial institution.

2 Theoretical Framework

The model is of a classical consumption-saving problem with a finite horizon in discrete time. Agents are indexed by $i \in (1, 2, ..., N)$, but agents' choices are fully independent of other agents' decisions. In each period, an agent i receives an exogenous income of y_{it} and decides how much to save and consume. Agent i receives utility in period t only from consumption, $u(c_{it})$. She seeks to maximize her discounted expected utility over the finite horizon of τ periods. That is,

$$\max_{c_{it}} \mathbb{E} \sum_{t=0}^{\tau} \beta^t u(c_{it}) \tag{1}$$

where each period is discounted by $\beta \in (0, 1]$. Following guidance by Carbone and Hey (2004), I assume a Constant Absolute Risk Aversion (CARA) utility function of the form

$$u(c_{it}) = 1 - e^{-R * c_{it}}$$

where R is the absolute risk aversion parameter. This utility function is strictly concave. The standard budget constraint in this type of model is given by

$$a_{i,t+1} = (1 + r)(a_{it} - c_{it}) + y_{i,t+1}$$

where agent i has a_{it} assets in period t, chooses a consumption amount c_{it}, gains an exogenous income of $y_{i,t+1}$, and earns a time-invariant rate of r on savings between periods. I make two significant changes to this budget constraint by introducing a PLSA and an Unexpected Expense.

Agent i deposits x_{it}^{PLS} tokens in the PLSA "Lottery Account." If the agent loses, she receives her original investment of x_{it}^{PLS}. If the agent wins, she receives her original investment of x_{it}^{PLS} plus a time-invariant prize Q.

In naturally-occurring settings, the probability of winning a PLSA prize is a function of other players' deposits. Individuals in the field behave atomistically and generally do not

consider other players' actions because of the large number of players. In the lab setting, the small number of players would cause one player's influence on other players to become large and unrealistic. Therefore, the probability of winning the PLSA prize in the model is a linear function of only this agent's deposit. The agent receives a common and time-invariant probability q for every token invested in the PLSA. This gives a total probability of agent i winning the prize in period t of qx_{it}^{PLS}. Investing $x_{it}^{PLS} = 0$ gives a probability of 0.

Substitutability between standard savings and the PLSA is determined by the relative rates of return and the agent's risk preference. A risk-averse agent would build a savings buffer early on to protect themselves from the shock in later periods. The savings buffer generates returns and could increase consumption in later periods, but it comes at the cost of consumption in early periods. If the agent is risk-neutral and the expected return on the PLSA is less than the expected return on standard savings, then the risk-neutral agent will never invest in PLS. While this result is intuitive, Kearney et al. (2010) reports that it contradicts empirical evidence from observational and experimental work. Many PLSAs offered in the field pay a lower expected return than a comparable saving mechanism, yet the PLSAs continue to attract deposits. A risk-taking agent would over-consume in each period (similar to living paycheck-to-paycheck). If this agent had to pay an unexpected expense, she would be forced to take out a high-interest loan. This risk-seeking behavior is also seen in the literature on gambling, where the agent places a bet that pays less-than-even odds. The agent loses utility from the lower returns but gains utility from the gamble. Maynard et al. (2008) applies this literature to PLSAs and estimates the agent's preference for skewness. The PLSA specifically appeals to risk-taking agents who may not choose to save adequately with a standard savings account but may be better incentivized by a chance to win a prize.

The Lottery Account (PLSA) is directly comparable to the Bank Account (standard savings) because both accounts are designed to have the same expected return. This is achieved by solving for probability q of the agent winning prize Q as the q which satisfies

the equation,

$$(1+r)x = (1-qx)x + qx(Q+x) \tag{2}$$

The left-hand side is the expected return of investing x tokens in the Bank Account. The right-hand side is the expected return from the Lottery Account. Solving Equation 2 for probability q yields

$$q = \frac{r}{Q}$$

For example, if the prize of the PLSA is $Q = 60$ tokens, the interest rate on standard saving $r = 0.16$, and the agent invests $x_{it}^{PLSA} = 20$ tokens in the PLSA, then agent i would have a $\frac{0.16}{60} * 20 \approx 5.3$ percent chance of winning the prize in period t. It is important to note that this function does not bound $q \in [0, 1]$. The agent could invest a sufficiently large amount of tokens in the PLSA to guarantee a win. The agent's return from doing so would be equivalent to the return from investing that amount in the Bank Account.

The agent faces a time-invariant and known probability p of paying a time-invariant Unexpected Expense of K tokens. Income y_{it} takes one of two states, $y_{it} \in \{y^{max}, y^{min}\}$ where y_{max} is the standard income and $y_{min} = y_{max} - K$.

If the agent does not have enough tokens to pay the Unexpected Expense, she must take out a Bank Loan. She is charged interest on this loan at the same rate as the Bank Account. If the agent reaches the end of the finite horizon in debt, she incurs a utility penalty that is increasing in the amount of the debt. This ensures that agents do not engage in Ponzi behavior.

Solving the model gives optimal consumption, standard saving, and PLSA saving functions, $c_n^*(a)$, $x_n^{SS*}(a)$, and $x_n^{PLS*}(a)$, respectively. These functions are defined by and satisfy the first-order and envelope conditions. The functions are related such that

$$c_n^*(a) = a - x_n^{SS*}(a) - x_n^{PLS*}(a) \tag{3}$$

3 Experimental Design

3.1 Treatments

There are three treatments. Each participant faces two treatments randomized at the session level. In the first treatment, participants have no access to a PLSA. In the second treatment, participants are offered PLSA (called the "Lottery Account") with a relatively high prize of six times their normal income. In the third and final treatment, participants are offered a PLSA with a relatively low prize of three times their normal income. Table 1 summarizes the three treatments.

Treatment	**PLSA Prize**
1	No PLSA Offered, "No Prize"
2	6x(Income), "High Prize"
3	3x(Income), "Low Prize"

Table 1: PLSA Prizes by Treatment

3.2 Budget Management Task

The budget management task leverages the dynamic life-cycle income methods implemented by Carbone and Hey (2004). The participant is given an income of twenty tokens and told that tokens have no value outside the experiment. The only way to earn money in the experiment is by converting tokens to dollars. Tokens are converted to dollars at a rate that follows a CARA utility function asymptotically approaching \$3.[3] It is not possible for the participant to earn more than \$3 in any single period. This property of the conversion rate incentivizes consumption smoothing by encouraging the participants to spread their consumption over many periods. The payment structure does not change as the game progresses. There is no artificial discounting in the experiment. Any tokens the participant

[3]The table of token values and their equivalent dollar value can be found in the Appendix under "Token Conversion Chart." The specific CARA utility function used is $u(c_{it}) = 3 * (1 - exp(-0.01c_{it}))$.

does not consume will be stored in a Bank Account that pays compound interest of sixteen percent. The participant has a ten percent chance of incurring the "Unexpected Expense"

Parameter	**Value**
Income (y_t)	20 tokens
Discount Rate (β)	1
Interest rate (r)	16%
PLS Prize (Q)	None, 60, or 120 tokens
Expense (K)	60 tokens
Probability(Expense) (p)	10%
CARA Risk Aversion Parameter	0.01
Maximum Consumption per Period	\$3

Table 2: Parameters

in every period. If the participant does not have enough tokens to cover the expense, she must take out a loan with a compound interest rate of sixteen percent. If the participant ends the experiment in debt, her earnings are penalized.[4] The participant can not willingly enter debt by consuming more tokens than they have available.

In treatments two and three, the participant can also store tokens in a "Lottery Account" which is a PLSA. The size of the Lottery Account prize depends on the treatment, but the Lottery Account always pays the same expected return as the Bank Account. If the prize is doubled, the probability of winning is halved. In this way, the Lottery Account always pays the same expected return of sixteen percent. The participant's probability of winning the prize is independent of other participants' choices and linearly increases in her investment in the Lottery Account. The participant can allocate her tokens across any mix of these three options: consumption, savings, and/or PLSA.

Figures 1 and 2 show screenshots of the experiment interface for treatments where the

[4]The exact amount of the penalty for any level of debt can be found on the back of the participant's Token Conversion Chart in the Appendix. Penalties are equal to the "negative" of the CARA utility function. For example, 20 tokens are worth \$0.54, and ending the experiment with a debt of 20 tokens will incur a penalty of \$0.54.

participant can access the Lottery Account. In Figure 1, the participant can fill in two blanks representing the number of tokens she places in the Lottery Account and the number of tokens she consumes. Clicking "Calculate" automatically places the remainder of the participant's tokens in the Bank Account. The Bank Account pays interest of sixteen percent. The "Calculate" button also shows the participant her probability of winning the sixty-token prize given the number of tokens she has chosen to place in the Lottery Account. Figure 2 shows the participant's choices: she places five tokens in her Bank Account, which will increase to six tokens in the next period; she places ten tokens in her Lottery Account, which gives her a 2.67 percent probability of winning the sixty-token prize;[5] and she converts five tokens into \$0.15, which will be added to her earnings. The control treatment without PLSA access is similar, but the participant can only choose the number of tokens to convert to dollars. The remaining tokens are placed in her Bank Account. Screenshots of the control treatment can be found in the Appendix.

The household's lifetime is effectively compressed into a 60-minute experimental session. This simplification could seem spurious at face value. For the experiment to carry external validity, it is only necessary for the participant's incentive to match the household's incentive. The participant's motivation is to maximize their total earnings in the experiment; the household's motivation is to maximize their total consumption over a lifetime. This experiment is externally valid because these incentives are mathematically equivalent.

[5]Note that this allocation in the Lottery Account yields the same expected return as the Bank Account, which is 16 percent. The calculation is: 0.0267 * 60 tokens $\approx$ 1.6 tokens, which is a 16 percent return on the 10 tokens invested in the Lottery Account.

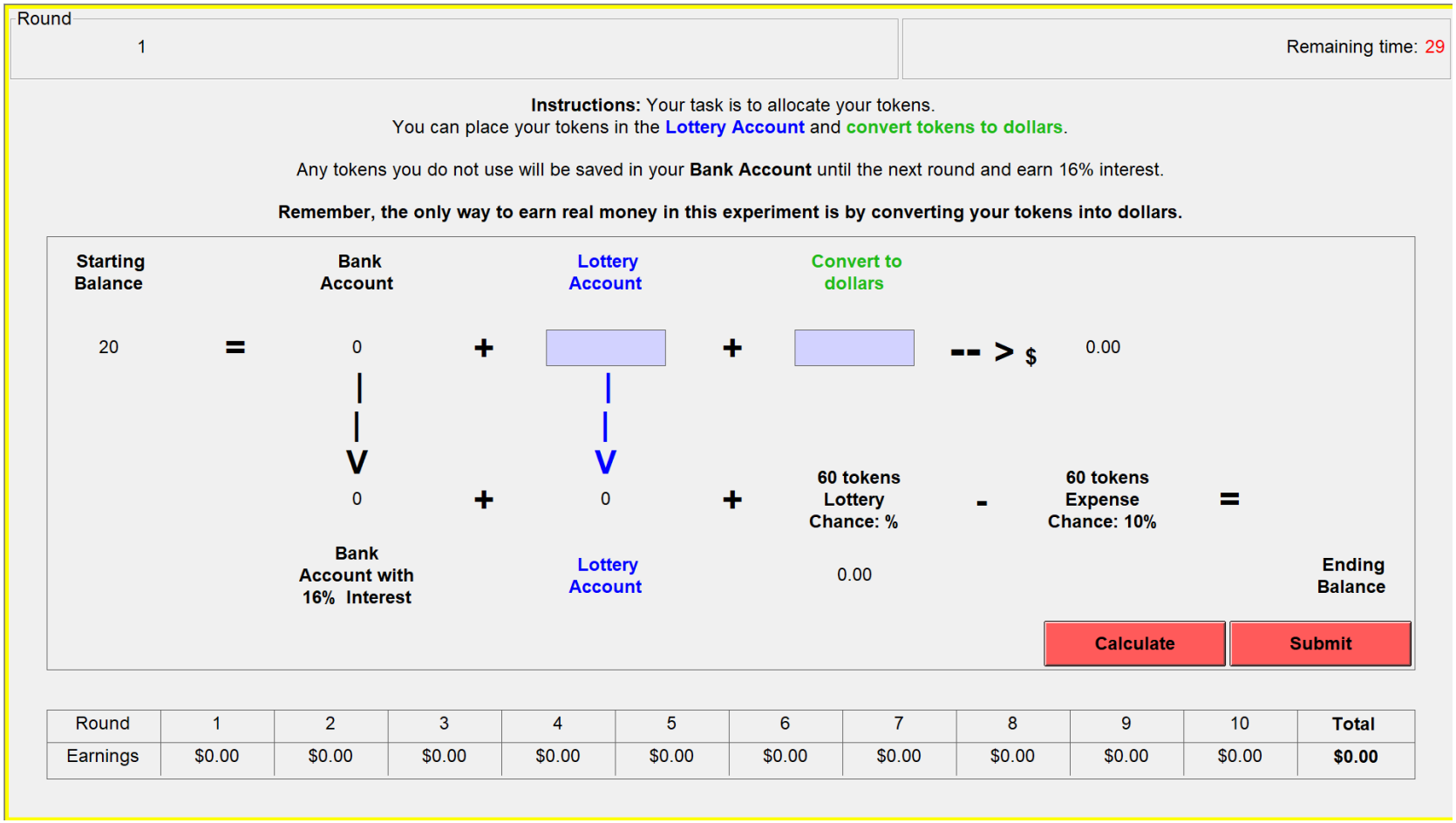


Figure 1: Starting Screen: This is the screen the participant would see when asked to input her decisions. The participant can choose between the Bank Account, the Lottery Account, or Convert to Dollars. Clicking Calculate will show the participant the projected interest she will earn on her Bank Account and her probability of winning the Lottery Prize.

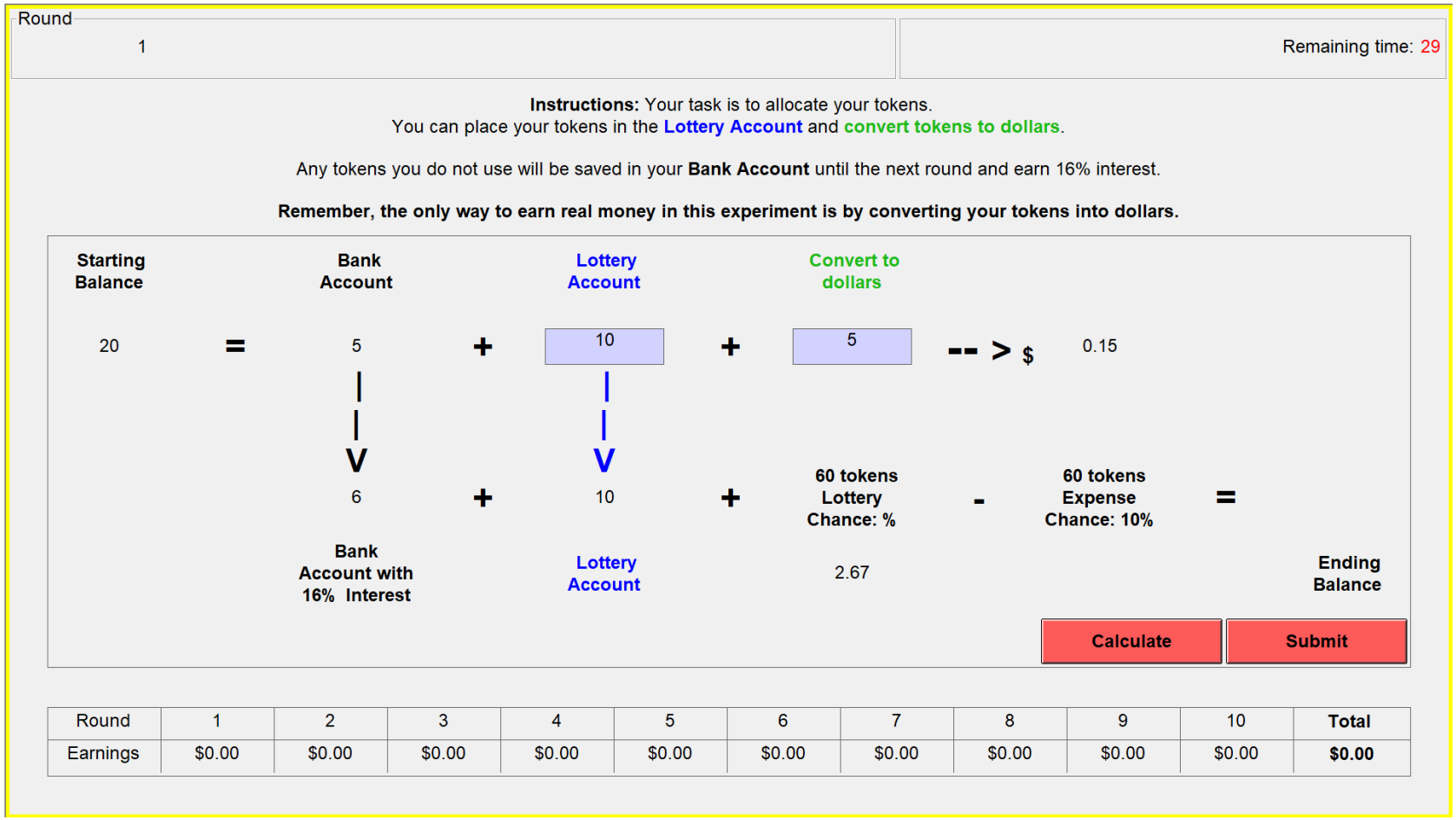


Figure 2: Choices: The participant has chosen to allocate ten tokens to the Lottery Account and convert five tokens into \$0.15. This leaves five tokens in her Bank Account, which will increase to six in the next period.

Figure 3: Order of Actions (No PLSA)

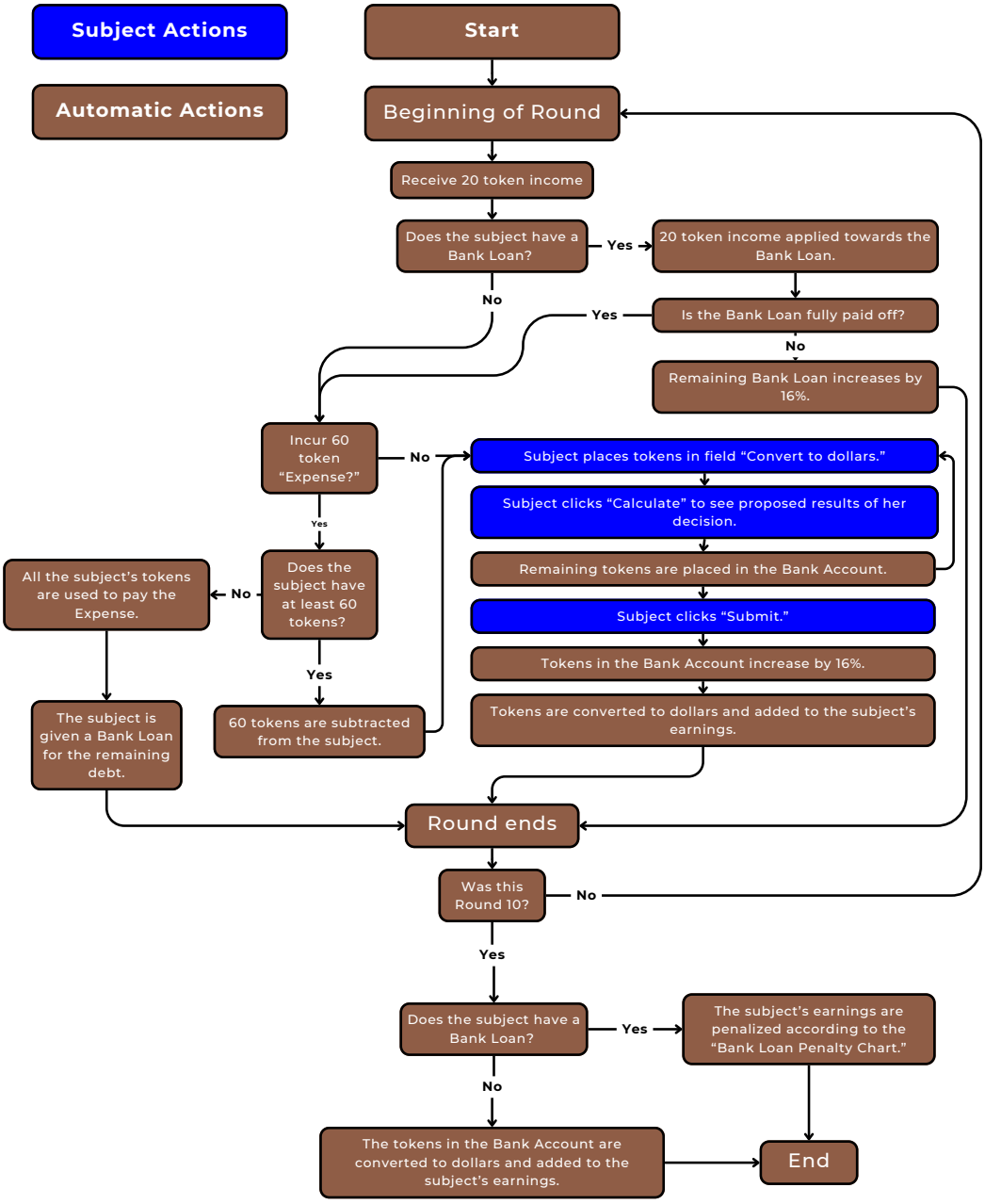


Figure 3: This flowchart shows the order of actions and calculations in a treatment with no Lottery Account (PLSA).

Figure 4: Order of Actions (With PLSA)

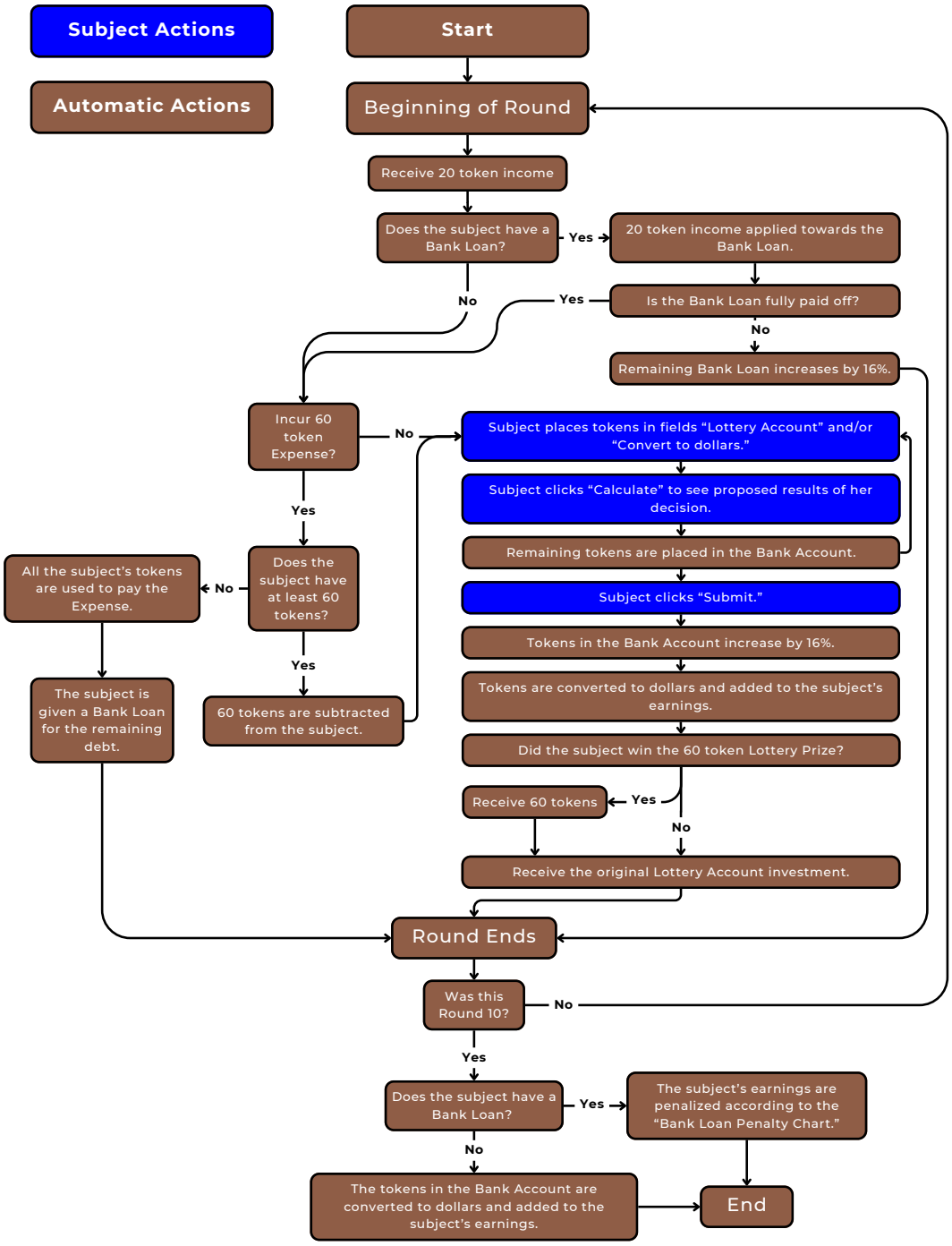


Figure 4: This flowchart shows the order of actions and calculations in a treatment with access to the Lottery Account (PLSA).

To characterize a participant's choice as optimal or suboptimal, I recursively solve the

model for the optimal policy function c^*. After calculating what the participant should have done for every observed choice, the participant's consumption error is defined as

$$\text{Error}_{it} = c_{it}^{\text{observed}} - c^*(a_{it})$$

The participant's consumption error is then divided by the level of their assets in that period. This yields the difference between participant i's observed marginal propensity to consume (MPC) and participant i's theoretically optimal MPC in period t. The resulting fraction MPC Error_{it} is bounded $[-1, 1]$. Positive values of MPC Error_{it} mean over-consumption, and negative values of MPC Error_{it} mean under-consumption. MPC Error_{it} is the first outcome variable used in empirical analysis.

$$\frac{\text{Error}_{it}}{a_{it}} = \frac{c_{it}^{\text{observed}} - c^*(a_{it})}{a_{it}} = \text{MPC}_{it}^{observed} - \text{MPC}_{it}^{*} = \text{MPC Error}_{it} \in [-1, 1] \qquad (4)$$

The second outcome measure is the participant's earnings from the experiment. The participant's earnings represent her welfare. Earnings between participants may vary due to the participants' luck with shocks and prizes, but these variations are orthogonal to treatment and do not bias the estimate of the treatment effect. Participants know their earnings at all times, but participants do not receive any information on the optimality of their choices.

3.3 Theoretical Predictions

A Monte-Carlo simulation of N=10,000 repetitions was used to demonstrate a participant's theoretically optimal behavior. Figures 5, 6, and 7 show the results of this simulation.

Figure 5 shows a participant's optimal asset and consumption paths. The participant consumes very little early in the experiment. Once a stock of tokens is built up as assets, the participant draws down the stock towards the end of the experiment.

Figure 6 shows the optimal MPC for a subject across periods. Participants should consume very little in early periods to build savings. At the end of the experiment, subjects

Figure 5: Average MPC Error by Treatment

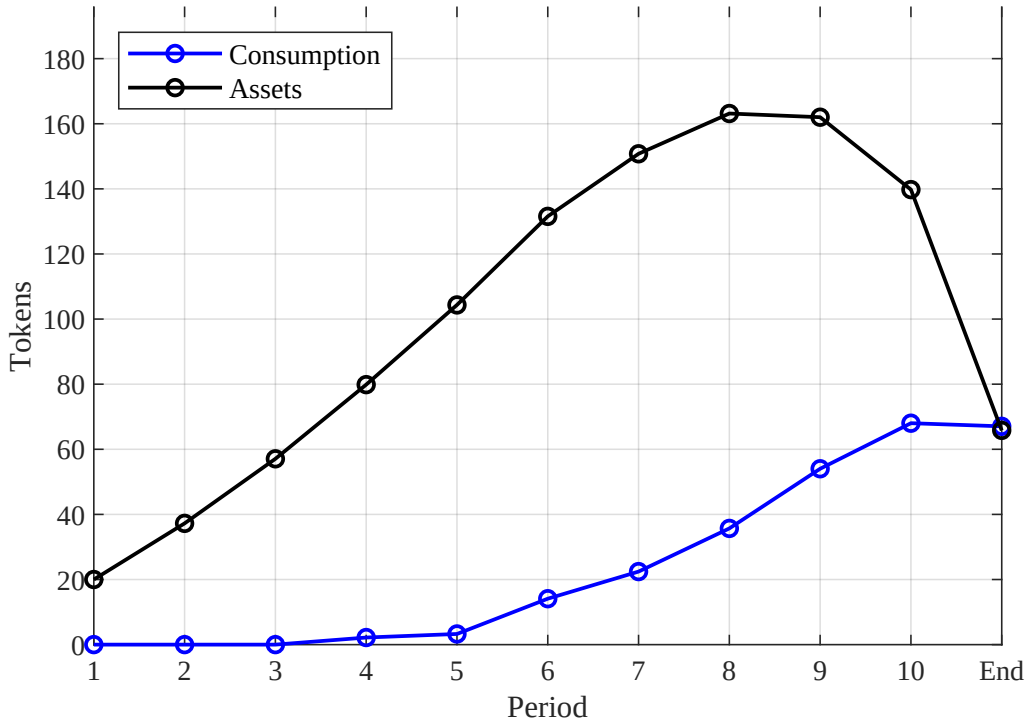


Figure 5: This figure shows results from a Monte-Carlo simulation (N=10,000) of a participant's optimal asset and consumption paths. The participant consumes very little early in the experiment. Once a stock of tokens is built up as assets, the participant draws down the stock towards the end of the experiment.

should consume their entire stock of assets.

Figure 7 shows the distribution of theoretically predicted earnings for participants who play the optimal strategy at every step of the experiment. Approximately 34.9 percent of simulated participants earn the maximum amount of $7.89 because of the construction of the shock probability. If participants have a 10 percent probability of receiving the shock in any of 10 periods, then there is a 34.9 percent probability of never receiving the shock.

3.4 Testable Hypotheses and Power Analysis

The experiment allows me to test the following hypotheses:

1. Introducing a PLSA does not affect participants' MPC Error or earnings.

Figure 6: Predicted MPC Across Periods

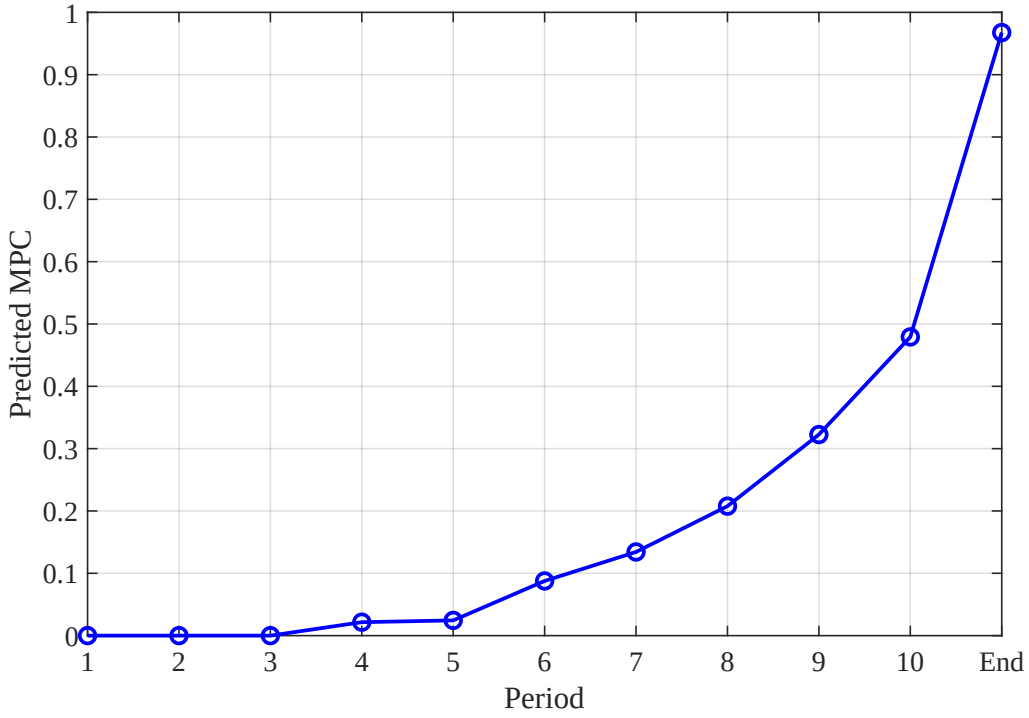


Figure 6: This figure shows the optimal MPC for a subject across periods. The figure was created using a Monte-Carlo simulation of N=10,000 "participants" playing the optimal strategy at every step. Participants should consume very little in early periods to build savings. At the end of the experiment, subjects should consume their entire stock of assets.

2. Varying the amount of the PLSA prize while holding its expected return fixed does not affect MPC Error or earnings.

These hypotheses will be tested using a within-participants method. In each session, the participants will be randomly assigned to play two different treatments of the experiment. This will allow for comparisons that control for the participant's unobservable confounding factors. The treatments are outlined in Table 1. Hypothesis 1 is tested by comparing the participant's consumption error between Treatment 2 and Treatment 1. Hypothesis 2 is tested by comparing the participant's consumption error between Treatment 3 and Treatment 1. Table 3 shows which treatments were implemented in each session type with the number of participants. The other parameter values used in the experiment are shown in Table 2.

Figure 7: Distribution of Predicted Earnings

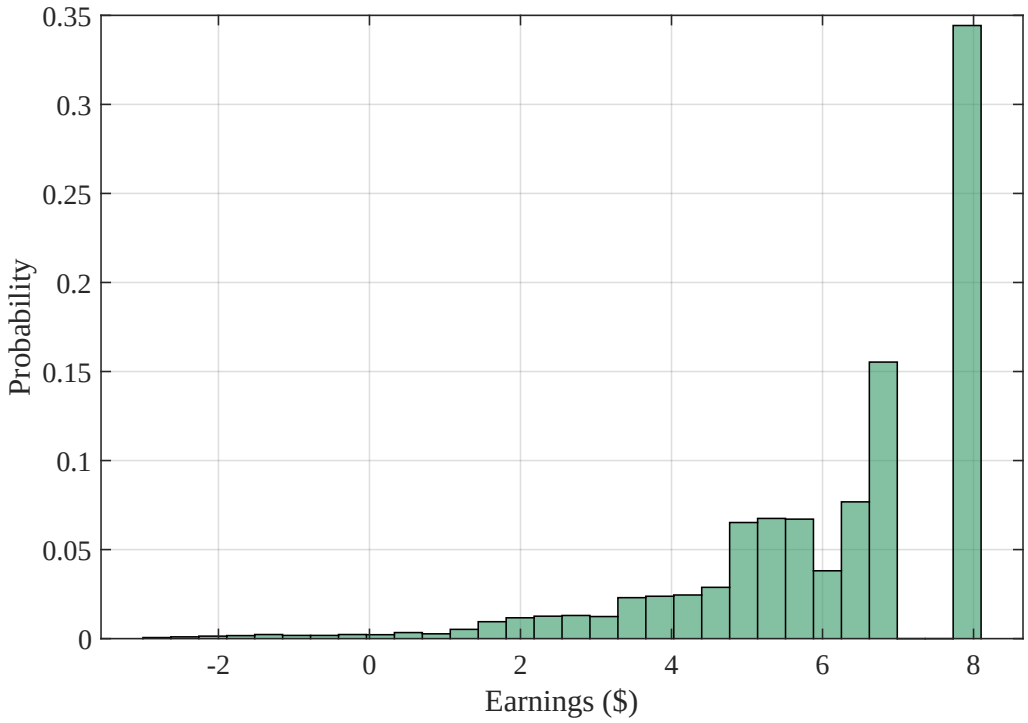


Figure 7: This figure shows the distribution of theoretically predicted earnings from a Monte-Carlo simulation (N=10,000) of participants who play the optimal strategy at every step of the experiment. Approximately 34.9 percent of simulated participants earn the maximum amount of $7.89 because of the construction of the shock probability. If participants have a 10 percent probability of receiving the shock in any of 10 periods, then there is a 34.9 percent probability of never receiving the shock.

A pilot session of the experiment was conducted on April 24, 2024, with twenty-four participants. Procedures and instructions closely followed those of the actual experiment, and participants were drawn from the same subject pool. Assuming the standard deviation from the pilot session, a power analysis was conducted to determine sample size. A sample size of forty-four participants per treatment allows me to detect a minimum treatment effect of 10 percent with 80 percent power at the 5 percent significance level. This analysis assumes a panel data structure with participant-level clustered standard errors. To place some perspective on these numbers, I can detect a change in MPC greater than $\approx 2.1 percent$ and a change in earnings greater than $\approx \$0.42$. The experimental design is well-powered to detect a modest degree of behavior change.

3.5 Experimental Procedures

Experiment sessions were conducted in the University of Tennessee - Knoxville Experimental Economics Laboratory. The experiment is computerized and implemented using the software z-Tree (Fischbacher, 2007). A typical session proceeds as follows. An experiment moderator verifies registrations with Student ID cards. Written instructions are provided to students. A moderator reads the instructions aloud while participants follow along. The moderator emphasizes that instructions contain only true information and that all individual decisions are anonymous. Participants enter decisions on individual lab computers, and seating is randomly assigned. The moderator encourages and answers questions.

The experiment has three stages. Participants first take part in the paid risk-elicitation survey by Holt and Laury (2002). In the second stage, participants engage in the main budget management task. At the beginning of the budget management task, participants play three practice periods and answer five paid quiz questions. Participants finish the session in stage three by completing a computerized survey on their financial behavior and demographics. Participants are confidentially paid their earnings in cash. Copies of the instructions, quiz questions, token conversion chart, survey, and screenshots of the experiment are located in the Appendix under "Supplementary Materials.".

3.6 Participants

Participants were recruited from an existing database of undergraduate students at the University of Tennessee that had previously registered to receive invitations for economics experiments. Participants were only allowed to attend one session of the experiment. Eleven sessions were conducted between April 24 and October 4, 2024. Participants each played two paid sequences of ten periods of the experiment. The average earning was $20.09. Participants earned money from a paid risk elicitation, a paid quiz, two sequences of the budget management task, and an $8 show-up fee. The average session time was approximately 61 minutes. Including the pilot, I use data from 157 participants. A summary of the data

collection by session type can be found in Table 3.

Session Type	Treatments	# Participants
No Prize/High Prize	1 & 2	56
No Prize/Low Prize	1 & 3	52
High Prize/Low Prize	2 & 3	49
Total		157

Table 3: Totals for the number of participants from whom data have been collected in each type of session.

4 Results

4.1 Data

Summary statistics from the experiment are shown in Table 4. There was a large amount of variation in the participants' assets. One unlucky participant ended with a debt of 294 tokens, while another participant won the lottery and at one time held 680 tokens. Negative balances in Standard Savings represent loans. On average, participants under-consumed by 9.06 tokens per period. This figure is heavily skewed by a few participants who hoarded a large number of tokens in the late periods. Participants incurred the Unexpected Expense in about nine percent of rounds (ten percent was the structural parameter). PLSA High and PLSA Low are indicators for whether the data came from a treatment with a high- or low-prized Lottery Account. PLSA pools these two treatments together. Second is an indicator variable that equals one if the sequence of ten rounds was the second sequence played by the participant within the session. Just over half of the participants were female.

Figure 8 shows the observed distribution of incurred expenses by period for the participants during the experiment. The independent probability of incurring the Unexpected Expense is 10 percent in any period. The ten-period experiment is played twice by every subject for a total of twenty periods played by each subject. A technical error in the experi-

Table 4: Summary Statistics

	Mean	St. Dev.	Min.	Max
Assets	88.34	95.59	-294	680
Standard Savings	57.62	85.19	-294	624
PLSA Savings	20.82	58.43	0	680
Tokens Consumed	9.92	26.81	0	455
Optimal Consumption	18.98	38.82	0	311
Dev. from Optimal Cons.	-9.06	42.68	-311	232
Abs. MPC Error	0.21	0.25	0	1
Expense Incurred	0.09	0.29	0	1
High Prize PLSA	0.33	0.47	0	1
Low Prize PLSA	0.32	0.47	0	1
Any PLSA	0.66	0.48	0	1
Second	0.50	0.50	0	1
Female	0.52	0.50	0	1
Observations	3140			

Table 4: This table shows summary statistics from all treatments of the experiment. A total of 157 participants each played two sequences of ten periods, resulting in 3,140 participant-period observations.

ment's code prevented all subjects from incurring the Unexpected Expense in the first period of the first sequence of the experiment. This error did not affect participant behavior and does not affect any calculations regarding optimality. This technical error was common to all participants. The results of the paper are robust to splitting the sample into "first sequence only" and "second sequence only." Robustness checks can be found in the Appendix.

Figure 8: Observed Distribution of Expenses by Period

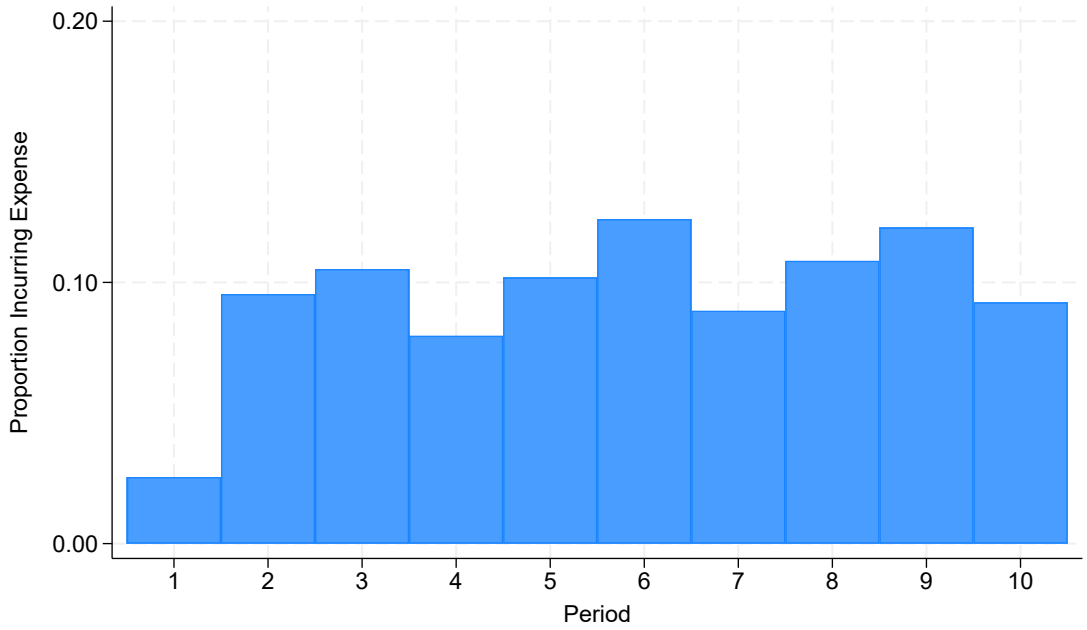


Figure 8: This figure shows the observed distribution of incurred expenses by period for the participants during the experiment. The independent probability of incurring the Unexpected Expense is 10 percent in any period. A technical error prevented subjects from experiencing the Unexpected Expense in the first period of the first sequence of the experiment. The results of the paper are robust to separating results by "first sequence only" and "second sequence only."

4.2 The Effect of PLSA Access on Savings and Earnings

I exploit variation in the treatments assigned to each participant. This within-participants design allows me to account for unobserved participant characteristics with the following specification:

$$\text{Outcome}_{ist} = \alpha + \beta_1 \cdot \underbrace{\text{PLSA High}_{is}}_{\substack{=1 \\ \text{if PLSA} \\ \text{offered} \\ \text{(High Prize)}}} + \beta_2 \cdot \underbrace{\text{PLSA Low}_{is}}_{\substack{=1 \\ \text{if PLSA} \\ \text{offered} \\ \text{(Low Prize)}}} + \delta \cdot \underbrace{\text{Second}_{is}}_{\substack{=1 \\ \text{if played} \\ \text{second} \\ \text{in session}}} + \bar{\gamma} \cdot \underbrace{\bar{X}_i}_{\substack{\text{part.} \\ \text{demog.}}} + \underbrace{u_{ist}}_{\substack{\text{error} \\ \text{corr. w/in} \\ \text{participants}}} \quad (5)$$

$$\text{where Outcome}_{ist} \in \left\{ \begin{array}{ll} \text{Bank Savings}_{ist} & \text{Table 5} \\ \text{Bank } + \text{PLSA Savings}_{ist} & \text{Table 6} \\ \text{Earnings}_{is} & \text{Table 7} \\ |\text{MPC Error}_{ist}| & \text{Table 8} \end{array} \right\}$$

where $\text{Bank Savings}_{ist}$ is participant i's tokens saved in the Bank Account in session s and period t; $\text{Bank } + \text{PLSA Savings}_{ist}$ is participant i's total tokens in the Bank Account and the PLSA Account in session s and period t; Earnings_{is} is participant i's earnings in dollars for experimental session s; MPC Error_{ist} is participant i's error in the marginal propensity to consume in period t in experimental session s; PLSA High_{is} is an indicator variable for whether the participant has access to a PLSA of the High Prize treatment; PLSA Low_{is} is an indicator variable for whether the participant has access to a PLSA of the Low Prize treatment; Second_{is} is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects;[6] and u_{it} is an error term, which I allow to be correlated across decisions made by the same participant. The coefficients of interest are β_1 and β_2.

The identifying assumption is that in the absence of treatment, the participant would behave similarly to a participant that was never treated. Treatment is assigned randomly, so the identifying assumption is strongly supported.

Equation 5 is estimated using OLS. The results are displayed in Tables 5, 6, 7, and 8. Column one shows results from the full sample, and the rest of the columns show results from estimating the equation using a subsample of participants in different categories of risk aversion.

Results in Table 6 show that access to a PLSA does not increase total precautionary savings, but Table 5 shows that PLSA access does cause portfolio reallocation. The treatment coefficients for both high prize and low prize PLSAs in Table 6 are imprecisely estimated in

[6]Whether the participant plays a type of the game first or second within a session is randomized at the participant level.

Table 5: Outcome: Bank Savings$_{ist}$ (Tokens), by Participant Risk Aversion

	All	Seeking	Neutral	Averse	V. Averse
High Prize PLSA	-27.17***	-27.47	-9.11	-31.89***	-21.34
	(7.25)	(16.65)	(14.91)	(9.32)	(65.90)
Low Prize PLSA	-23.68***	-48.61**	-1.88	-24.05**	-36.85
	(7.41)	(19.21)	(17.63)	(9.17)	(56.31)
Second	7.53	14.39	5.39	7.10	22.70
	(5.07)	(11.82)	(9.41)	(6.93)	(33.41)
Constant	70.56***	51.86***	45.36***	79.17***	93.52
	(5.92)	(10.68)	(13.57)	(7.38)	(54.55)
N	3140	480	480	2020	160

Table 5: Results from estimating Equation 5 for subsets of participants with varying risk aversion categories. The outcome variable is Bank Savings$_{ist}$: participant i's tokens saved in the Bank Account in period t of experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

the full sample, with point estimates near zero. This pattern persists across risk preference subgroups: neither treatment causes precisely estimated effects on total savings for risk-seeking, risk-neutral, or risk-averse participants.[7] The evidence indicates that PLSAs cause portfolio reallocation rather than new savings creation.

Access to a prize-linked savings account causes participants to shift their precautionary savings away from traditional bank accounts. Table 5 reports treatment effects on bank account balances. Column one presents results from the full sample: participants with

[7]The exception appears in the risk-neutral subsample, where access to the low prize PLSA is weakly associated with a 43.45 token increase in total savings, though this effect is not replicated in the high prize treatment. Table 6 contains twenty hypothesis tests; one false positive test should be expected.

Table 6: Outcome: Bank + PLSA Savings$_{ist}$ (Tokens), by Participant Risk Aversion

	All	Seeking	Neutral	Averse	V. Averse
High Prize PLSA	5.72	20.30	4.85	3.13	-14.72
	(7.03)	(16.56)	(15.24)	(8.94)	(61.48)
Low Prize PLSA	6.90	-19.08	43.45*	6.09	-27.79
	(8.25)	(20.62)	(22.57)	(10.14)	(55.24)
Second	8.49	1.23	9.94	12.19	17.78
	(5.57)	(11.49)	(13.40)	(7.48)	(32.79)
Constant	70.06***	58.83***	42.58***	76.81***	98.44
	(6.18)	(14.26)	(14.63)	(7.50)	(53.56)
N	3140	480	480	2020	160

Table 6: Results from estimating Equation 5 for subsets of participants with varying risk aversion categories. The outcome variable is Bank + PLSA Savings$_{ist}$: participant i's total combined savings between the Bank Account and the Lottery Account (PLSA) in period t of session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

access to the high prize PLSA maintain bank balances that are 27.17 tokens lower than control participants, a reduction of 38.5 percent.[8] Participants with access to the low prize PLSA maintain balances 23.68 tokens lower, a reduction of 33.6 percent.[9]

The magnitude of this substitution effect varies substantially across risk preference categories. Risk-seeking participants exhibit the strongest crowdout: the low prize PLSA causes a reduction of 48.61 tokens, or 93.7 percent,[10] while the high prize PLSA effect is imprecisely estimated. This relatively large crowdout toward the PLSA aligns with a risk-seeking

[8]Calculated as $-27.17/70.56 \approx 0.385$.
[9]Calculated as $-23.68/70.56 \approx 0.336$.
[10]Calculated as $-48.61/51.86 \approx 0.937$.

Table 7: Outcome: Earnings$_{is}$ ($), by Participant Risk Aversion

	All	Seeking	Neutral	Averse	V. Averse
High Prize PLSA	-0.397*	-0.333	-0.874	-0.305	0.744
	(0.215)	(0.634)	(0.552)	(0.263)	(0.490)
Low Prize PLSA	-0.774***	-1.080	-0.506	-0.793***	0.782
	(0.233)	(0.647)	(0.786)	(0.286)	(0.891)
Second	-0.353*	-0.374	-0.350	-0.322	0.465
	(0.184)	(0.568)	(0.564)	(0.214)	(0.808)
Constant	4.350***	4.678***	4.523***	4.287***	2.227**
	(0.178)	(0.410)	(0.568)	(0.214)	(0.801)
N	3140	480	480	2020	160

Table 7: Results from estimating Equation 5 for subsets of participants with varying risk aversion categories. The outcome variable is Earnings$_{is}$: participant i's earnings in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

participant's preference for stochastic returns over deterministic interest. Risk-neutral participants show minimal measurable response to treatment. Risk-averse participants reduce bank savings by 31.89 tokens (40.3 percent)[11] when offered the high prize PLSA and by 24.05 tokens (30.4 percent)[12] when offered the low prize PLSA.

Risk-averse participants maintain substantially higher baseline savings levels (76.81 tokens compared to 58.83 tokens for risk-seeking participants, as shown in Table 6), which allows them to allocate a portion toward the PLSA while retaining high savings.

Shifting savings to the PLSA causes participants to earn less in the experiment. Table 7

[11]Calculated as $-31.89/79.17 \approx 0.403$.
[12]Calculated as $-24.05/79.17 \approx 0.304$.

reports treatment effects on total earnings accumulated over the ten-period experiment. In the full sample, participants with access to the high prize PLSA earn approximately 0.397 dollars less than control participants, a reduction of 9.1 percent.[13] Participants with access to the low prize PLSA earn 0.774 dollars less, a reduction of 17.8 percent.[14] This earnings loss reflects foregone compound interest: participants who shift savings from the deterministic bank account (which pays sixteen percent interest per period) to the stochastic PLSA do not realize offsetting lottery gains over the ten-period experimental horizon. This suggests the entertainment utility derived from the lottery mechanism is at least as valuable as the foregone returns.

The earnings loss associated with PLSA access exhibits limited heterogeneity across risk preference categories, with only one subgroup effect precisely estimated. Risk-averse participants treated with the low prize PLSA experience an earnings decline of 0.793 dollars, representing approximately 18.5 percent of control group earnings for this subgroup.[15] Treatment effects for risk-seeking, risk-neutral, and very risk-averse participants are imprecisely estimated, as are effects of the high prize PLSA on risk-averse participants.

4.3 The Effect of PLSA Access on Behavior Optimality

Access to a PLSA causes participants to shift their consumption behavior closer to the optimal path. Table 8 reports treatment effects on absolute deviations from optimal marginal propensity to consume. In the full sample, the high prize PLSA causes participants to reduce consumption errors by 13.1 percent,[16] while the low prize PLSA reduces errors by 19.2 percent.[17] Both treatment effects are precisely estimated and economically meaningful, indicating that PLSA access helps participants smooth consumption more effectively across periods.

[13] Calculated as $-0.397/4.350 \approx 0.091$.
[14] Calculated as $-0.774/4.350 \approx 0.178$.
[15] Calculated as $-0.793/4.287 \approx 0.185$
[16] Calculated as $-0.038/0.291 \approx 0.131$.
[17] Calculated as $-0.056/0.291 \approx 0.192$.

Table 8: Outcome: |MPC Error$_{ist}$| (Tokens), by Participant Risk Aversion

	All	Seeking	Neutral	Averse	V. Averse
High Prize PLSA	-0.035*	-0.094*	-0.129**	-0.001	0.030
	(0.018)	(0.051)	(0.050)	(0.019)	(0.057)
Low Prize PLSA	-0.055***	-0.086	-0.142***	-0.029	0.010
	(0.018)	(0.056)	(0.043)	(0.020)	(0.025)
Second	-0.026**	-0.025	-0.039	-0.026*	-0.045*
	(0.013)	(0.039)	(0.033)	(0.014)	(0.019)
Constant	0.252***	0.329***	0.332***	0.219***	0.172***
	(0.017)	(0.033)	(0.050)	(0.020)	(0.019)
N	3140	480	480	2020	160

Table 8: Results from estimating Equation 5 for subsets of participants with varying risk aversion categories. The outcome variable is |MPC Error$_{ist}$|: participant i's error in the marginal propensity to consume in period t in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

The magnitude of this behavioral improvement varies substantially across risk preference categories. Risk-seeking participants experience the largest gains in optimality: the high prize PLSA causes consumption errors to decline by 60.6 percent,[18] while the low prize PLSA causes consumption errors to decline by 52.2 percent.[19] This pattern aligns with risk-seeking participants starting furthest from optimal behavior in the control condition (baseline error of 0.226 tokens compared to 0.291 tokens overall). Risk-neutral participants also exhibit substantial improvements, with the high prize PLSA reducing errors by 19.0 percent[20] and

[18] Calculated as $-0.137/0.226 \approx 0.606$.
[19] Calculated as $-0.118/0.226 \approx 0.522$.
[20] Calculated as $-0.114/0.601 \approx 0.190$.

the low prize PLSA reducing errors by 29.3 percent.[21] In contrast, treatment effects for risk-averse and very risk-averse participants are imprecisely estimated, suggesting PLSA access does not meaningfully improve their consumption optimality. Risk-averse participants already exhibit relatively optimal behavior in the control condition (baseline error of 0.287 tokens), leaving limited room for improvement through PLSA access.

4.4 The Effect of Financial Shocks

The experiment's dynamic design allows examination of how participants respond to unexpected financial shocks over multiple periods. Four key questions arise: First, does access to a PLSA cause participants to build a larger protective savings buffer against unexpected expenses? Second, how do participants change their savings behavior after experiencing a shock? Third, does PLSA access affect the probability of needing to borrow when facing an unexpected expense? Fourth, do participants move closer to optimal consumption after experiencing a shock?

Figure 10 shows participants' deviations from optimal consumption after incurring the Unexpected Expense. Positive values represent over-consumption and negative values represent under-consumption. Participants over-consume after experiencing the shock relative to those who never incurred the expense. This pattern is consistent with the gambler's fallacy, causing participants to believe they are less likely to face another expense in the future and leading them to consume too many tokens, leaving themselves vulnerable to subsequent shocks.

Figure 9 demonstrates savings behavior after the Unexpected Expense. Participants incur a sixty-token expense, causing immediate asset decreases of approximately sixty tokens. The expense has persistent effects: participants attempt to rebuild savings but experience further asset declines in later periods. The effect is larger for participants with PLSA access. This occurs because PLSA users miss the opportunity to benefit from compound interest in the

[21] Calculated as $-0.176/0.601 \approx 0.293$.

Bank Account. When participants experience the expense early in the experiment and have allocated savings to the PLSA rather than the high-interest bank account, they lose the exponential growth opportunity that compounds over the remaining periods.

Table 9 examines the probability that participants must borrow when facing the Unexpected Expense. The outcome variable equals one if participants lack sufficient tokens to cover the expense and must take out a loan. Control group participants borrow with probability 56 percent. The low prize PLSA causes the borrowing probability to increase by 24.4 percent,[22] while the high prize PLSA effect is imprecisely estimated. This increased vulnerability follows directly from the portfolio substitution documented earlier: participants who shift savings from the Bank Account to the PLSA forego compound interest, leaving them with fewer accumulated assets when the shock occurs.

Figure 9: Effect of Unexpected Expense on Assets

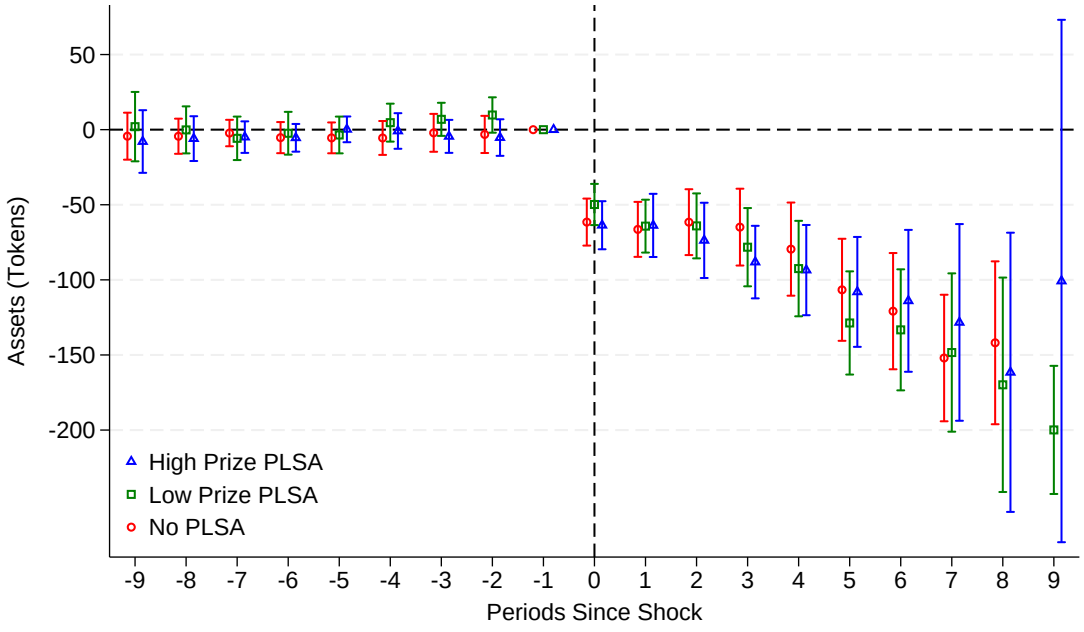


Figure 9: This event study graph shows the effect of incurring the Unexpected Expense on the participant's assets. The event study model includes period fixed effects to demean the predictably parabolic time trend of a subject's assets from compound interest. The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income. The confidence intervals shown are at the 95 percent level.

[22] Calculated as $0.1366/0.5602 \approx 0.244$.

Figure 10: Effect of Unexpected Expense on Optimal Consumption

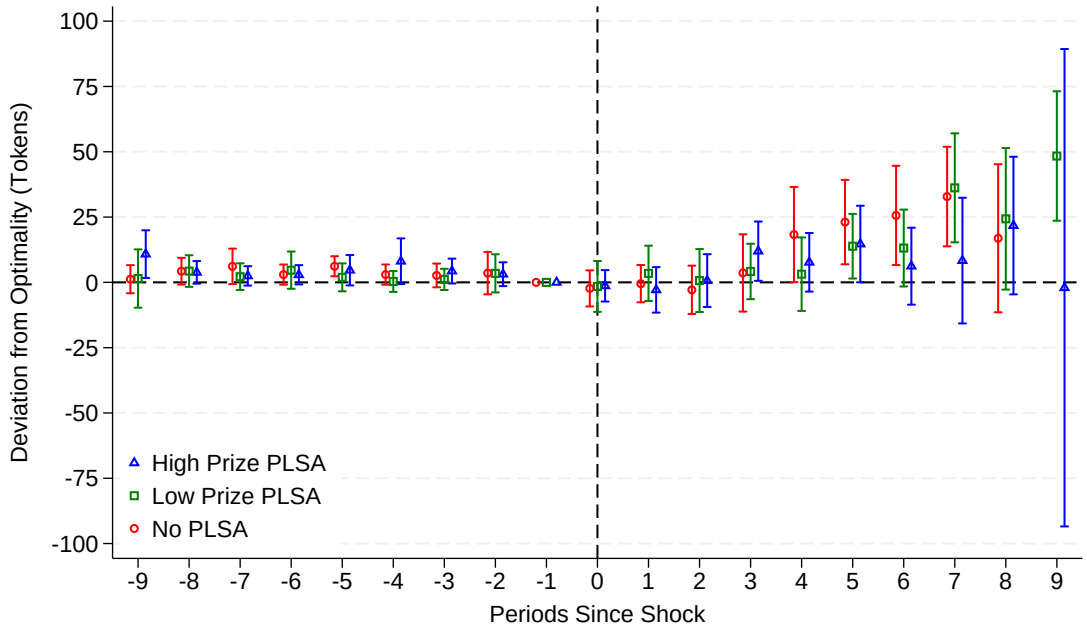


Figure 10: This event study graph shows the effect of incurring the Unexpected Expense on the participant's deviations from optimal consumption. A positive amount of tokens represents over-consumption, and a negative amount of tokens represents under-consumption. The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income. Confidence intervals shown are at the 95 percent level.

Table 9: Outcome: Prob(Borrow when Shocked)

	(1)	(2)	(3)	(4)
Any PLSA	0.0760	0.0760		
	(0.0708)	(0.0713)		
Second		0.0003		0.0124
		(0.0708)		(0.0695)
High Prize PLSA			0.0086	0.0070
			(0.0828)	(0.0834)
Low Prize PLSA			0.1366*	0.1367*
			(0.0815)	(0.0815)
Constant	0.6237**	0.6234**	0.5728*	0.5602*
	(0.2973)	(0.3050)	(0.2918)	(0.2993)
N	296	296	296	296

Table 9: This table shows the probability a participant must borrow when she incurs the Unexpected Expense. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. Column 1 estimates the model without controlling for learning effects, and Column 2 controls for learning effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 3 and 4 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

4.5 Robustness

Robustness checks were conducted for all major results and can be found in the Appendix. The results are robust to omitting participant demographics and limiting observations to only the first sequence of rounds played by participants.

5 Discussion

This paper investigates whether prize-linked savings accounts can increase precautionary savings for households facing liquidity constraints and unexpected financial shocks. PLSAs do not create new savings among participants with access to traditional bank accounts; PLSAs cause substantial portfolio reallocation, with participants reducing bank savings by 38.5 to 33.6 percent depending on prize structure. This substitution imposes measurable costs. When offered a PLSA, participants earn between 9.1 to 17.8 percent less money in the experiment. Reallocating savings from the interest-bearing account to the stochastic PLSA with equal expected return causes participants to lose out on compound interest.

The portfolio reallocation mechanism operates through risk preferences. Risk-seeking participants exhibit the most dramatic crowdout, reducing traditional bank savings by 93.7 percent when offered the low prize PLSA. This substitution reflects their preference for random returns over steady interest. This is consistent with the theoretical prediction that PLSAs appeal most to individuals with low risk aversion. Risk-averse participants display more moderate responses, reducing bank savings by 40.3 to 30.4 percent, while maintaining higher baseline savings levels that permit diversification across both account types. The entertainment utility participants derive from the lottery mechanism must be substantial to rationalize this behavior. This entertainment value constitutes a form of behavioral engagement.

These findings carry implications for financial institutions considering PLSA offerings. Banks should recognize that PLSAs can have different appeal for existing savers and previously unbanked households. This creates both opportunities and risks. On the revenue side, substitution away from high-yield savings accounts toward PLSAs with lower expected payouts could improve bank profitability, particularly if the PLSA prize structure is carefully calibrated. The magnitude of crowdout varies substantially with prize design: high prize PLSAs cause 38.5 percent reductions in traditional savings, while low prize PLSAs cause 33.6 percent reductions. Banks can exploit this sensitivity to optimize prize structures

that balance customer appeal against payout costs. However, institutions must also consider that customers who substitute into PLSAs over short horizons forfeit compound interest protection, potentially leaving them more exposed to liquidity shocks.

Regulators and governments should understand that PLSAs excel at behavioral engagement. The heterogeneous treatment effects across risk preference categories demonstrate that one-size-fits-all policy design is inappropriate. PLSAs deliver the largest optimality improvements for risk-seeking participants (60.6 percent) who exhibit the worst baseline consumption behavior, indicating these accounts function as engagement tools for precisely the households least likely to save adequately. Meanwhile, risk-averse participants experience minimal treatment effects. Optimal policy design should target PLSAs toward unbanked and risk-seeking populations while steering risk-averse banked households toward traditional high-yield accounts where compound interest protection matters most over short horizons.

References

Kadir Atalay, Fayzan Bakhtiar, Stephen Cheung, and Robert Slonim. Savings and Prize-Linked Savings Accounts. *Journal of Economic Behavior & Organization*, 107:86–106, 2014.

T Parker Ballinger, Eric Hudson, Leonie Karkoviata, and Nathaniel T Wilcox. Saving Behavior and Cognitive Abilities. *Experimental Economics*, 14(3):349–374, 2011.

Alexander L Brown, Zhikang Eric Chua, and Colin F Camerer. Learning and Visceral Temptation in Dynamic Saving Experiments. *The Quarterly Journal of Economics*, 124 (1):197–231, 2009.

Enrica Carbone and John D. Hey. The Effect of Unemployment on Consumption: An Experimental Analysis. *The Economic Journal*, 114(497):660–683, 06 2004. ISSN 0013-0133. doi: 10.1111/j.1468-0297.2004.00236.x.

Felipe Dizon and Travis J Lybbert. Leveraging the Lottery for Financial Inclusion: Lotto-Linked Savings Accounts in Haiti. *Economic Development and Cultural Change*, 69(4): 1323–1349, 2021. doi: 10.1086/705681.

John Duffy and Andreas Orland. Liquidity Constraints, Income Variance, and Buffer Stock Savings: Experimental Evidence. *International Economic Review*, 2025.

Emel Filiz-Ozbay, Jonathan Guryan, Kyle Hyndman, Melissa Kearney, and Erkut Y Ozbay. Do Lottery Payments Induce Savings Behavior? Evidence from the Lab. *Journal of Public Economics*, 126:1–24, 2015.

Urs Fischbacher. z-Tree: Zurich Toolbox for Ready-Made Economic Experiments. *Experimental Economics*, 10:171–178, 2007.

Adam Friedman. This Lender Said Its Loans Would Help Tennesseans. It Has Sued More

Than 110,000 of Them. — propublica.org. https://www.propublica.org/article/flex-loans-tennessee-advance-financial, 2025. [Accessed 01-10-2025].

Paul Gertler, Sean Higgins, Aisling Scott, and Enrique Seira. The Long-Term Effects of Temporary Incentives to Save: Evidence from a Prize-Linked Savings Field Experiment. *NBER w31529*, 2023.

John D. Hey and Valentino Dardanoni. Optimal Consumption Under Uncertainty: An Experimental Investigation. *The Economic Journal*, 98(390):105–116, 1988. ISSN 0013-0133. doi: 10.2307/2233308.

Charles A Holt and Susan K Laury. Risk Aversion and Incentive Effects. *American Economic Review*, 92(5):1644–1655, 2002.

Paan Jindapon, Pacharasut Sujarittanonta, and Ajalavat Viriyavipart. Prize-Linked Savings Games: Theory and Experiment. *Games and Economic Behavior*, 133:202–229, 2022.

Melissa Schettini Kearney, Peter Tufano, Jonathan Guryan, and Erik Hurst. Making Savers Winners: An Overview of Prize-Linked Savings Products. *NBER w16433*, 2010.

Nick Maynard, Jan-Emmanuel De Neve, and Peter Tufano. Consumer Demand for Prize-Linked Savings: a Preliminary Analysis. *Harvard Business School Finance Working Paper*, 08-061, 2008.

Thomas Meissner. Intertemporal Consumption and Debt Aversion: an Experimental Study. *Experimental Economics*, 19(2):281–298, 2016.

New York Fed. SCE Credit Access Survey. newyorkfed.org/microeconomics/sce/credit-access#/financial-fragility1, 2025. [Accessed 4-11-2025].

Richard H Thaler and Cass R Sunstein. *Nudge: Improving decisions about health, wealth, and happiness*. Penguin, 2009.

6 Appendix: Supplementary Materials

6.1 PLSA Legality in the United States

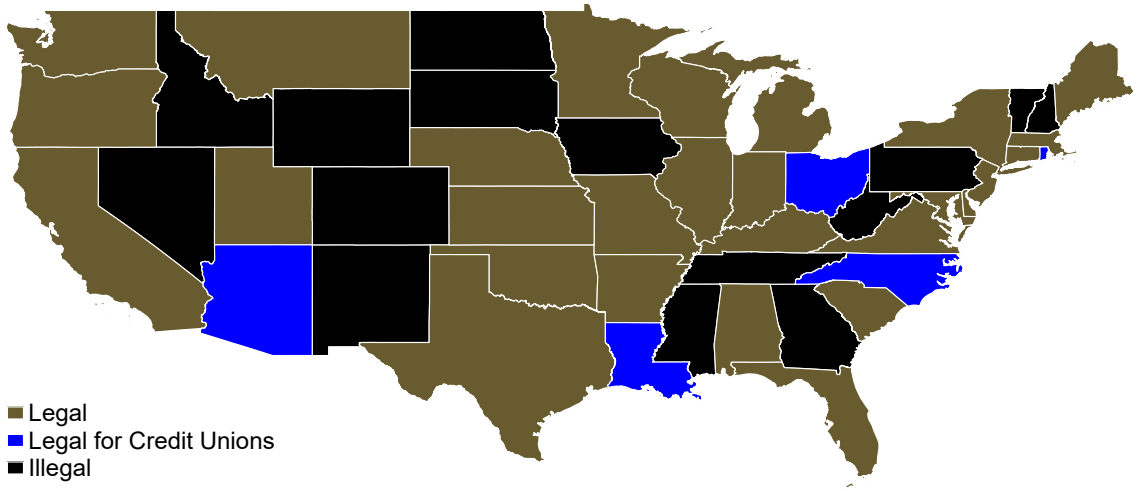


Figure 11: This map shows the legal status of prize-linked savings accounts (PLSAs) in the United States as of October 11, 2024.

6.2 Robustness Checks

Table 10: Outcome: Bank Savings$_{ist}$ (Tokens)

	(1)	(2)	(3)	(4)
Any PLSA	-25.1337***	-24.9165***		
	(6.5892)	(6.5107)		
Second		7.5225		7.5465
		(5.0957)		(5.0836)
High Prize PLSA			-26.8523***	-26.6727***
			(7.2684)	(7.2356)
Low Prize PLSA			-23.3338***	-23.0758***
			(7.5115)	(7.4097)
Constant	51.6648***	47.7980***	50.5533***	46.6494***
	(17.6574)	(17.7067)	(17.6560)	(17.6714)
N	3140	3140	3140	3140

Table 10: Results from estimating Equation 5. The outcome variable is Bank Savings$_{ist}$: participant i's earnings in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

6.3 Experiment Materials

The following pages contain copies of the materials given to participants of the experiment.

Introduction (H/L)

Thank you for participating in today's study. Please follow the instructions carefully. At any time, please feel free to raise your hand if you have a question. At the end of today's session, you will be paid your earnings privately and in cash.

You have been randomly assigned an ID number for this session. You will make decisions using a computer. You will never be asked to reveal your identity to anyone. Your name will never be associated with any of your decisions. In order to keep your decisions private, please do not reveal your choices or otherwise communicate with any other participant. Importantly, please refrain from verbally reacting to events that occur.

Today's session has four parts: Experiment 1, 2, 3, and a short questionnaire. We will proceed through the written materials together. Please do not enter any decisions on the computer until instructed to do so.

Instructions for Experiment 1

Please refer to your computer screen while we read the instructions.

We would like you to make a decision for each of the 10 scenarios. Each scenario involves a choice between playing a lottery that pays either $4 or $0 according to specified chances (Option A) or receiving $2 for sure (Option B).

You will notice that the only differences across scenarios are the chances of receiving the high or low prize for the lottery. At the end of today's session, ONE of the 10 scenarios will be selected at random and you will be paid according to your decision for this selected scenario ONLY. Each scenario has an equal chance of being selected.

Please consider your choice for each scenario carefully. Since you do not know which scenario will be played out, it is in your best interest to treat each scenario as if it will be the one used to determine your earnings.

Before making decisions, are there any questions?

Please proceed to enter decisions on your computer. Once you are ready to submit your decisions, please click the "Submit" button.

Instructions for Experiments 2 and 3

Please refer to your computer screen while we read the instructions.

For this experiment, you will be working independently from everyone else. Your decisions do not affect the other players. Similarly, the other players do not affect your outcomes.

In this experiment, you will be asked to manage a budget over a time period of 10 rounds. Each round will be split into 2 phases: Action and Results.

Phase One: Action

At the beginning of each round, you will be given 20 digital tokens. You have several options on how to allocate your tokens. You can:

- **Convert tokens to dollars** at the rate found on the sheet "Token Conversion Chart."
- Place your tokens in the **Bank Account** until the next round and earn interest.
- Place your tokens in the **Lottery Account**, which I will give more details on in a moment.

You may allocate your tokens across any blend of these options you wish. In other words, you do not have to only choose one of these options.

Lottery Account: For every token you put in the Lottery Account, you get entered in a drawing for a prize. In other words, the more tokens invested in your Lottery Account, the higher chance you have of winning the prize. For example, if the probability of winning is 0.05% and you invest 50 tokens, your probability of winning the prize is (50) x (0.05) = 2.5%.

It is important to remember that other players' choices do not affect your chances of winning the prize, nor do your choices affect their chances. Multiple people can win the prize in a round, and it is possible that no one wins the prize in a round.

Tokens invested in the Lottery Account do not earn interest, but they are not lost. If you do not win the prize, your tokens will roll over to be used in the next round. Again, you keep your original investment even if you do not win the prize. The prize will be drawn at the end of the round and your status (Win or Lose) will be displayed during the Results phase.

The amount of the prize will be different in Experiment 3.

Phase Two: Results

After you have made your token allocation choice, you will see a summary of your decision. You will also see the results of the Lottery Account, whether you WON the prize or not.

You will then start the next round. You will be given:

- another "income" of bonus tokens,
- the tokens you chose to save in the last period,
- the interest earned on those saved tokens,
- the tokens you chose to invest in the Lottery Account, and
- the prize, if you won.

You will then begin again with the Action phase.

Your earnings for Experiments 2 and 3 will be the total of all the dollars you've gained by converting tokens. Please note that tokens have no value by themselves. The only way to earn money in Experiments 2 and 3 is by converting tokens to dollars.

Any tokens left over in your accounts when the experiment ends will automatically be converted to dollars. For example, if you end Experiment 2 with 50 tokens, those tokens will be converted into $1.18.

The Unexpected Expense: There is a chance at the start of every period that you will have to pay the Unexpected Expense. If you have to pay the expense, two situations may happen:

- If you have enough tokens on hand, you will pay the expense "out of pocket." These tokens will be "spent," and then can not be converted or saved.
- If you do not have enough tokens to pay the expense "out of pocket," you must take out a Bank Loan. The Bank Loan will charge you interest until the debt is paid off. While you have a Bank Loan, your income in each period will automatically be allocated to paying off your Bank Loan.
- **If you end Experiment 2 or Experiment 3 with a Bank Loan, your earnings will be penalized.** The exact amount of the penalty can be found on the back of your "Token Conversion Chart." For example, if you end Experiment 2 with a Bank Loan of 50 tokens, $1.18 will be **subtracted** from your Experiment 2 earnings.

At the end of Experiment 2, any tokens you have left over will automatically be converted into dollars. Everything will reset, and we will begin Experiment 3 with a "clean slate." Your decisions in Experiment 2 will not affect anything in Experiment 3. In other words, Experiments 2 and 3 are fully independent.

We will now play unpaid practice rounds. Before we begin the practice rounds, are there any questions?

Please now turn to your screen, where we will play practice rounds. If you have any questions, please raise your hand.

Practice Round Screens

- This practice round gives an example of the screen you will see. Whatever tokens you do not convert to dollars or place in the Lottery Account will be saved in your Bank Account. Clicking "Calculate" will show you the proposed results of your decision. Please note that you have a limited amount of time to make your decision, and no one can move on until you've made your decision. Please practice allocating your tokens between the **Bank Account**, the **Lottery Account**, and **Converting tokens to dollars.** Once you've made your decision, please click **Submit.**
- This screen shows the result of the second practice round. You did not incur the Unexpected Expense and you did not win the Lottery Prize. In the next round, you would be given another 20 bonus tokens, and then you would make your decisions again.

Quiz

We will now take a short quiz about Experiments 2 and 3 to check your understanding. Please refer to your "Token Conversion Chart" as you answer the quiz questions. You will earn $0.50 for each correct answer.

Before we begin the quiz, are there any questions?

Before making decisions in Experiment 2, are there any questions?

<u>Instructions for Experiment 3</u>

Experiment 3 will be similar to Experiment 2. The only difference will be in the size of the prize of the Lottery Account. Your decisions from Experiment 2 will not affect your earnings in Experiment 3, and vice versa.

Before making decisions in Experiment 3, are there any questions?

Introduction (N/L & N/H)

Thank you for participating in today's study. Please follow the instructions carefully. At any time, please feel free to raise your hand if you have a question. At the end of today's session, you will be paid your earnings privately and in cash.

You have been randomly assigned an ID number for this session. You will make decisions using a computer. You will never be asked to reveal your identity to anyone. Your name will never be associated with any of your decisions. In order to keep your decisions private, please do not reveal your choices or otherwise communicate with any other participant. Importantly, please refrain from verbally reacting to events that occur.

Today's session has four parts: Experiment 1, 2, 3, and a short questionnaire. We will proceed through the written materials together. Please do not enter any decisions on the computer until instructed to do so.

Instructions for Experiment 1

Please refer to your computer screen while we read the instructions.

We would like you to make a decision for each of the 10 scenarios. Each scenario involves a choice between playing a lottery that pays either $4 or $0 according to specified chances (Option A) or receiving $2 for sure (Option B).

You will notice that the only differences across scenarios are the chances of receiving the high or low prize for the lottery. At the end of today's session, ONE of the 10 scenarios will be selected at random and you will be paid according to your decision for this selected scenario ONLY. Each scenario has an equal chance of being selected.

Please consider your choice for each scenario carefully. Since you do not know which scenario will be played out, it is in your best interest to treat each scenario as if it will be the one used to determine your earnings.

Before making decisions, are there any questions?

Please proceed to enter decisions on your computer. Once you are ready to submit your decisions, please click the "Submit" button.

Instructions for Experiments 2 and 3

Please refer to your computer screen while we read the instructions.

For this experiment, you will be working independently from everyone else. Your decisions do not affect the other players. Similarly, the other players do not affect your outcomes.

In this experiment, you will be asked to manage a budget over a time period of 10 rounds. Each round will be split into 2 phases: Action and Results.

Phase One: Action

At the beginning of each round, you will be given 20 digital tokens. You have several options on how to allocate your tokens. You can:

- **Convert tokens to dollars** at the rate found on the sheet "Token Conversion Chart."
- Place your tokens in the **Bank Account** until the next round and earn interest.
- Place your tokens in the **Lottery Account**, which I will give more details on in a moment.

You may allocate your tokens across any blend of these options you wish. In other words, you do not have to only choose one of these options.

Lottery Account: You will have access to the Lottery Account during **EITHER** Experiment 2 or Experiment 3. If you do not have access to the Lottery Account in Experiment 2, it will be turned on in Experiment 3, and vice versa. Whether you have access to the Lottery Account in Experiment 2 versus Experiment 3 is decided **randomly**.

For every token you put in the Lottery Account, you get entered in a drawing for a prize. In other words, the more tokens invested in your Lottery Account, the higher chance you have of winning the prize. For example, if the probability of winning is 0.05% and you invest 50 tokens, your probability of winning the prize is (50) x (0.05) = 2.5%.

It is important to remember that other players' choices do not affect your chances of winning the prize, nor do your choices affect their chances. Multiple people can win the prize in a round, and it is possible that no one wins the prize in a round.

Tokens invested in the Lottery Account do not earn interest, but they are not lost. If you do not win the prize, your tokens will roll over to be used in the next round. Again, you keep your original investment even if you do not win the prize. The prize will be drawn at the end of the round and your status (Win or Lose) will be displayed during the Results phase.

Phase Two: Results

After you have made your token allocation choice, you will see a summary of your decision. You will also see the results of the Lottery Account, whether you WON the prize or not.

You will then start the next round. You will be given:

- another "income" of bonus tokens,
- the tokens you chose to save in the last period,
- the interest earned on those saved tokens,
- the tokens you chose to invest in the Lottery Account, and
- the prize, if you won.

You will then begin again with the Action phase.

Your earnings for Experiments 2 and 3 will be the total of all the dollars you've gained by converting tokens. Please note that tokens have no value by themselves. The only way to earn money in Experiments 2 and 3 is by converting tokens to dollars.

Any tokens left over in your accounts when the experiment ends will automatically be converted to dollars. For example, if you end Experiment 2 with 50 tokens, those tokens will be converted into $1.18.

The Unexpected Expense: There is a chance at the start of every period that you will have to pay the Unexpected Expense. If you have to pay the expense, two situations may happen:

- If you have enough tokens on hand, you will pay the expense "out of pocket." These tokens will be "spent," and then can not be converted or saved.
- If you do not have enough tokens to pay the expense "out of pocket," you must take out a Bank Loan. The Bank Loan will charge you interest until the debt is paid off. While you have a Bank Loan, your income in each period will automatically be allocated to paying off your Bank Loan.
- **If you end Experiment 2 or Experiment 3 with a Bank Loan, your earnings will be penalized.** The exact amount of the penalty can be found on the back of your "Token Conversion Chart." For example, if you end Experiment 2 with a Bank Loan of 50 tokens, $1.18 will be **subtracted** from your Experiment 2 earnings.

At the end of Experiment 2, any tokens you have left over will automatically be converted into dollars. Everything will reset, and we will begin Experiment 3 with a "clean slate." Your decisions in Experiment 2 will not affect anything in Experiment 3. In other words, Experiments 2 and 3 are fully independent.

We will now play two unpaid practice rounds. Before we begin the practice rounds, are there any questions?

Please now turn to your screen, where we will play two practice rounds. If you have any questions, please raise your hand.

Practice Round Screens

1. This practice round gives an example of what it looks like if you do not have access to the **Lottery Account**. Please practice allocating your tokens between the **Bank Account** and **Converting tokens to dollars.** Whatever tokens you do not convert to dollars will be saved in your Bank Account. Clicking "Calculate" will show you the proposed results of your decision. Please note that you have a limited amount of time to make your decision, and no one can move on until you've made your decision. Once you've made your decision, please click **Submit.**
2. This screen shows the result of the first practice round. You did not incur the Unexpected Expense. In the next round, you would be given another 20 bonus tokens, and then you would make your decisions again.
3. This practice round gives an example of what it looks like if you have access to the **Lottery Account**. Whatever tokens you do not convert to dollars or place in the Lottery Account will be saved in your Bank Account. Clicking "Calculate" will show you the proposed results of your decision. Please practice allocating your tokens between the **Bank Account**, the **Lottery Account**, and **Converting tokens to dollars.** Once you've made your decision, please click **Submit.**
4. This screen shows the result of the second practice round. You did not incur the Unexpected Expense and you did not win the Lottery Prize. In the next round, you would be given another 20 bonus tokens, and then you would make your decisions again.

Quiz

We will now take a short quiz about Experiments 2 and 3 to check your understanding. Please refer to your "Token Conversion Chart" as you answer the quiz questions. You will earn $0.50 for each correct answer.

Before we begin the quiz, are there any questions?

Before making decisions in Experiment 2, are there any questions?

<u>Instructions for Experiment 3</u>

Experiment 3 will be similar to Experiment 2. If you had access to the Lottery Account in Experiment 2, you will not have access to the Lottery Account in Experiment 3. Similarly, if you did not have access to the Lottery Account in Experiment 2, you will have access to the Lottery Account in Experiment 3. Your decisions from Experiment 2 will not affect your earnings in Experiment 3, and vice versa.

Before making decisions in Experiment 3, are there any questions?

Token Conversion Chart

Tokens	Dollars
1	$0.03
2	$0.06
3	$0.09
4	$0.12
5	$0.15
6	$0.17
7	$0.20
8	$0.23
9	$0.26
10	$0.29
11	$0.31
12	$0.34
13	$0.37
14	$0.39
15	$0.42
16	$0.44
17	$0.47
18	$0.49
19	$0.52
20	$0.54
21	$0.57
22	$0.59
23	$0.62
24	$0.64
25	$0.66
26	$0.69
27	$0.71
28	$0.73
29	$0.76
30	$0.78
31	$0.80
32	$0.82
33	$0.84
34	$0.86
35	$0.89
36	$0.91
37	$0.93
38	$0.95
39	$0.97

Tokens	Dollars
40	$0.99
41	$1.01
42	$1.03
43	$1.05
44	$1.07
45	$1.09
46	$1.11
47	$1.12
48	$1.14
49	$1.16
50	$1.18
51	$1.20
52	$1.22
53	$1.23
54	$1.25
55	$1.27
56	$1.29
57	$1.30
58	$1.32
59	$1.34
60	$1.35
61	$1.37
62	$1.39
63	$1.40
64	$1.42
65	$1.43
66	$1.45
67	$1.46
68	$1.48
69	$1.50
70	$1.51
71	$1.53
72	$1.54
73	$1.55
74	$1.57
75	$1.58
76	$1.60
77	$1.61
78	$1.62

Tokens	Dollars
79	$1.64
80	$1.65
81	$1.67
82	$1.68
83	$1.69
84	$1.70
85	$1.72
86	$1.73
87	$1.74
88	$1.76
89	$1.77
90	$1.78
91	$1.79
92	$1.80
93	$1.82
94	$1.83
95	$1.84
96	$1.85
97	$1.86
98	$1.87
99	$1.89
100	$1.90
101	$1.91
102	$1.92
103	$1.93
104	$1.94
105	$1.95
106	$1.96
107	$1.97
108	$1.98
109	$1.99
110	$2.00
111	$2.01
112	$2.02
113	$2.03
114	$2.04
115	$2.05
116	$2.06
117	$2.07

Tokens	Dollars
118	$2.08
119	$2.09
120	$2.10
121	$2.11
122	$2.11
123	$2.12
124	$2.13
125	$2.14
126	$2.15
127	$2.16
128	$2.17
129	$2.17
130	$2.18
131	$2.19
132	$2.20
133	$2.21
134	$2.21
135	$2.22
136	$2.23
137	$2.24
138	$2.25
139	$2.25
140	$2.26
150	$2.33
160	$2.39
170	$2.45
180	$2.50
190	$2.55
200	$2.59
210	$2.63
220	$2.67
230	$2.70
240	$2.73
250	$2.75
260	$2.78
270	$2.80
280	$2.82
290	$2.83
300	$2.85

Token Conversion Chart – Bank Loan Penalty

If you *end* Experiment 2 or Experiment 3 with a Bank Loan, your earnings will be penalized by the following amount:

Loan	Dollars
1	- $0.03
2	- $0.06
3	- $0.09
4	- $0.12
5	- $0.15
6	- $0.17
7	- $0.20
8	- $0.23
9	- $0.26
10	- $0.29
11	- $0.31
12	- $0.34
13	- $0.37
14	- $0.39
15	- $0.42
16	- $0.44
17	- $0.47
18	- $0.49
19	- $0.52
20	- $0.54
21	- $0.57
22	- $0.59
23	- $0.62
24	- $0.64
25	- $0.66
26	- $0.69
27	- $0.71
28	- $0.73
29	- $0.76
30	- $0.78
31	- $0.80
32	- $0.82
33	- $0.84
34	- $0.86
35	- $0.89
36	- $0.91
37	- $0.93
38	- $0.95
39	- $0.97

Loan	Dollars
40	- $0.99
41	- $1.01
42	- $1.03
43	- $1.05
44	- $1.07
45	- $1.09
46	- $1.11
47	- $1.12
48	- $1.14
49	- $1.16
50	- $1.18
51	- $1.20
52	- $1.22
53	- $1.23
54	- $1.25
55	- $1.27
56	- $1.29
57	- $1.30
58	- $1.32
59	- $1.34
60	- $1.35
61	- $1.37
62	- $1.39
63	- $1.40
64	- $1.42
65	- $1.43
66	- $1.45
67	- $1.46
68	- $1.48
69	- $1.50
70	- $1.51
71	- $1.53
72	- $1.54
73	- $1.55
74	- $1.57
75	- $1.58
76	- $1.60
77	- $1.61
78	- $1.62

Loan	Dollars
79	- $1.64
80	- $1.65
81	- $1.67
82	- $1.68
83	- $1.69
84	- $1.70
85	- $1.72
86	- $1.73
87	- $1.74
88	- $1.76
89	- $1.77
90	- $1.78
91	- $1.79
92	- $1.80
93	- $1.82
94	- $1.83
95	- $1.84
96	- $1.85
97	- $1.86
98	- $1.87
99	- $1.89
100	- $1.90
101	- $1.91
102	- $1.92
103	- $1.93
104	- $1.94
105	- $1.95
106	- $1.96
107	- $1.97
108	- $1.98
109	- $1.99
110	- $2.00
111	- $2.01
112	- $2.02
113	- $2.03
114	- $2.04
115	- $2.05
116	- $2.06
117	- $2.07

Loan	Dollars
118	- $2.08
119	- $2.09
120	- $2.10
121	- $2.11
122	- $2.11
123	- $2.12
124	- $2.13
125	- $2.14
126	- $2.15
127	- $2.16
128	- $2.17
129	- $2.17
130	- $2.18
131	- $2.19
132	- $2.20
133	- $2.21
134	- $2.21
135	- $2.22
136	- $2.23
137	- $2.24
138	- $2.25
139	- $2.25
140	- $2.26
150	- $2.33
160	- $2.39
170	- $2.45
180	- $2.50
190	- $2.55
200	- $2.59
210	- $2.63
220	- $2.67
230	- $2.70
240	- $2.73
250	- $2.75
260	- $2.78
270	- $2.80
280	- $2.82
290	- $2.83
300	- $2.85

Table 11: Outcome: Earnings$_{is}$ ($)

	(1)	(2)	(3)	(4)
Any PLSA	-0.5490***	-0.5591***		
	(0.1897)	(0.1875)		
Second		-0.3498*		-0.3525*
		(0.1849)		(0.1843)
High Prize PLSA			-0.3486	-0.3570*
			(0.2168)	(0.2144)
Low Prize PLSA			-0.7589***	-0.7709***
			(0.2378)	(0.2363)
Constant	4.8528***	5.0326***	4.9824***	5.1648***
	(0.3255)	(0.3405)	(0.3482)	(0.3640)
N	3140	3140	3140	3140

Table 11: Results from estimating Equation 5. The outcome variable is Earnings$_{is}$: participant i's earnings in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. Column 1 estimates the model without controlling for learning effects, and Column 2 controls for learning effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 3 and 4 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

Quiz (Computerized)

$0.50 paid for every correct answer.

1. You have 20 tokens to allocate. True or False: If you convert all your tokens to dollars, you will earn $0.54 this round. Answer: TRUE

2. You have 20 tokens to allocate. True or False: If you allocate half your tokens to the Lottery Account (but do not win) and convert the other half to dollars, you will carry 10 tokens over to the next round. Answer: TRUE

Table 12: Outcome: |MPC Error$_{ist}$|

	(1)	(2)	(3)	(4)
Any PLSA	-0.0460***	-0.0468***		
	(0.0158)	(0.0156)		
Second		-0.0264**		-0.0265**
		(0.0125)		(0.0126)
High Prize PLSA			-0.0375**	-0.0381**
			(0.0176)	(0.0175)
Low Prize PLSA			-0.0550***	-0.0559***
			(0.0178)	(0.0176)
Constant	0.2717***	0.2853***	0.2772***	0.2909***
	(0.0281)	(0.0287)	(0.0285)	(0.0290)
N	3140	3140	3140	3140

Table 12: Results from estimating Equation 5. The outcome variable is |MPC Error$_{ist}$|: participant i's error in the marginal propensity to consume in period t in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. Column 1 estimates the model without controlling for learning effects, and Column 2 controls for learning effects. The variables PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 3 and 4 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

3. You have 20 tokens to allocate. If you allocate half your tokens to the Lottery Account (but do not win) and convert the other half to dollars, how many dollars will you earn this round? $_____ Answer: $0.29

4. If you convert 134 tokens to dollars, how many dollars will you earn this round? $_____ Answer: $2.21

5. If you end the experiment with a debt of -20 tokens, how much will be SUBTRACTED

Table 13: Outcome: |MPC Error$_{ist}$|
(Not Controlling for Participant Demographics)

	(1)	(2)	(3)	(4)
Any PLSA	-0.0443***	-0.0451***		
	(0.0159)	(0.0159)		
Second		-0.0264**		-0.0265**
		(0.0125)		(0.0125)
High Prize PLSA			-0.0347*	-0.0354*
			(0.0181)	(0.0180)
Low Prize PLSA			-0.0543***	-0.0552***
			(0.0177)	(0.0176)
Constant	0.2383***	0.2520***	0.2383***	0.2521***
	(0.0157)	(0.0167)	(0.0157)	(0.0167)
N	3140	3140	3140	3140

Table 13: Results from estimating Equation 5. The outcome variable is |MPC Error$_{ist}$|: participant i's error in the marginal propensity to consume in period t in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. Column 1 estimates the model without controlling for learning effects, and Column 2 controls for learning effects. The variables PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 3 and 4 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

from your earnings? \$_____ Answer: \$0.54

Table 14: Outcome: |MPC Error$_{ist}$|
(Data from First Sequence Only)

	(1)	(2)
Any PLSA	-0.0485*	
	(0.0249)	
High Prize PLSA		-0.0312
		(0.0268)
Low Prize PLSA		-0.0658**
		(0.0280)
Constant	0.3603***	0.3705***
	(0.0296)	(0.0306)
N	1570	1570

Table 14: Results from estimating Equation 5. The outcome variable is |MPC Error$_{ist}$|: participant i's error in the marginal propensity to consume in period t in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. The variables PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

Part 1: About the Experiment

We would now like for you to complete a short questionnaire. Please answer the following questions to the best of your knowledge. All information is completely anonymous and confidential. The first questions relate to your experience in today's experiment.

1. Have you previously participated in a paid study that took place in an experimental economics laboratory?

   a. Yes

   b. No

2. Please indicate your level of agreement with the following statement: "I understood well the instructions for the budget management experiment."

   1 - Strongly Disagree;

Table 15: Outcome: |MPC Error$_{ist}$|
(Data from Second Sequence Only)

	(1)	(2)
Any PLSA	-0.0394	
	(0.0240)	
High Prize PLSA		-0.0340
		(0.0275)
Low Prize PLSA		-0.0452*
		(0.0262)
Constant	0.1818***	0.1855***
	(0.0379)	(0.0397)
N	1570	1570

Table 15: Results from estimating Equation 5. The outcome variable is |MPC Error$_{ist}$|: participant i's error in the marginal propensity to consume in period t in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. The variables PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

2 – Disagree;

3 – Neutral;

4 – Agree;

5 –Strongly Agree

3. Please indicate your level of agreement with the following statement: "I was well compensated for my participation in this study."

   1 - Strongly Disagree;

   2 – Disagree;

   3 – Neutral;

   4 – Agree;

Table 16: Outcome: Assets when incurring Unexpected Expense (Tokens)
(Not Controlling for Participant Demographics)

	(1)	(2)	(3)	(4)
Any PLSA	-22.9917	-21.8437		
	(14.4109)	(14.3683)		
Second		-15.9190		-16.9963
		(13.3077)		(13.2140)
High Prize PLSA			-17.0181	-14.7635
			(17.7770)	(17.5948)
Low Prize PLSA			-28.3136*	-28.0046*
			(15.7658)	(15.6346)
Constant	52.4773***	60.4368***	52.4773***	60.9754***
	(11.2578)	(12.7941)	(11.2770)	(12.7514)
N	296	296	296	296

Table 16: This table shows the effect on a participant's level of total assets at the moment of incurring the Unexpected Expense. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. Column 1 estimates the model without controlling for learning effects, and Column 2 controls for learning effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 3 and 4 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

5 – Strongly Agree

Part 2: Personality

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other. All questions below are to be rated from 1-7. 1 represents strongly disagree and 7 represents strongly agree.

Table 17: Outcome: Assets when incurring Unexpected Expense (Tokens)
(Data from First Sequence Only)

	(1)	(2)
Any PLSA	-0.2276	
	(19.3250)	
High Prize PLSA		12.0305
		(23.9002)
Low Prize PLSA		-10.5658
		(21.7123)
Constant	31.1262	34.4314
	(49.4882)	(48.6093)
N	133	133

Table 17: This table shows the effect on a participant's level of total assets at the moment of incurring the Unexpected Expense. PLSA is an indicator variable for whether the participant has access to a PLSA. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize. The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

I see myself as:
a. Extroverted, enthusiastic
b. Critical, quarrelsome
c. Dependable, self-disciplined
d. Anxious, easily upset
e. Impulsive, excitable
f. Reserved, quiet
g. Disorganized, careless
h. Calm, emotionally stable

Part 3: Financial Management

We'll now ask some questions about how you manage your personal finances.

1. In the next month, do you expect to be unable to fully pay any of the following bills? You may check more than one answer.

Table 18: Outcome: Assets when incurring Unexpected Expense (Tokens)
(Data from Second Sequence Only)

	(1)	(2)
Any PLSA	-26.9072	
	(19.9540)	
High Prize PLSA		-22.5539
		(23.2080)
Low Prize PLSA		-31.2678
		(23.1478)
Constant	47.2388	51.0731
	(31.3079)	(32.4483)
N	163	163

Table 18: This table shows the effect on a participant's level of total assets at the moment of incurring the Unexpected Expense. PLSA is an indicator variable for whether the participant has access to a PLSA. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize. The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

a. Rent or mortgage
b. Water, gas, or electric
c. Credit card
d. Phone
e. Student loan
f. Car Payment
g. Other bills

2. Imagine you have to pay an unexpected expense of $1,000 within the next week. How certain are you that you could pay it completely?

   a. I would not be able to pay $1,000 in the next week.

Table 19: Outcome: Prob(Borrow when Shocked)
(Not Controlling for Participant Demographics)

	(1)	(2)	(3)	(4)
Any PLSA	0.1014	0.0981		
	(0.0750)	(0.0751)		
Second		0.0462		0.0582
		(0.0722)		(0.0701)
High Prize PLSA			0.0264	0.0187
			(0.0918)	(0.0915)
Low Prize PLSA			0.1682**	0.1671**
			(0.0814)	(0.0810)
Constant	0.3409***	0.3178***	0.3409***	0.3118***
	(0.0577)	(0.0653)	(0.0578)	(0.0642)
N	296	296	296	296

Table 19: This table shows the probability a participant must borrow when she incurs the Unexpected Expense. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. Column 1 estimates the model without controlling for learning effects, and Column 2 controls for learning effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 3 and 4 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

b. .

c. I may be able to pay $1,000 in the next week.

d. .

e. I am certain I would be able to pay $1,000 in the next week.

3. If you had to pay an unexpected expense of $1,000 within the next week, how would you do so? You may check multiple answers.

Table 20: Outcome: Prob(Borrow when Shocked)
(Data from First Sequence Only)

	(1)	(2)
Any PLSA	0.0599	
	(0.1048)	
High Prize PLSA		0.0105
		(0.1166)
Low Prize PLSA		0.1016
		(0.1239)
Constant	0.5010*	0.4876*
	(0.2703)	(0.2700)
N	133	133

Table 20: This table shows the probability a participant must borrow when she incurs the Unexpected Expense. PLSA is an indicator variable for whether the participant has access to a PLSA. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

a. Pay with cash or its equivalent (debit card, savings)
b. Put it on a credit card and pay it off over time
c. Ask for money from parents
d. Borrow from a friend or family member
e. Sell something
f. Use a bank loan
g. Use a payday loan, cash advance, or overdraft
h. I would not be able to pay $1,000 in the next week

4. If you had to pay an unexpected expense of $1,000 within the next week, how would this affect your financial health? You may check multiple answers.

Table 21: Outcome: Prob(Borrow when Shocked)
(Data from Second Sequence Only)

	(1)	(2)
Any PLSA	0.0988	
	(0.1034)	
High Prize PLSA		0.0088
		(0.1207)
Low Prize PLSA		0.1889*
		(0.1096)
Constant	0.6777***	0.5985**
	(0.2332)	(0.2300)
N	163	163

Table 21: This table shows the probability a participant must borrow when she incurs the Unexpected Expense. PLSA is an indicator variable for whether the participant has access to a PLSA. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

a. I would not be able to buy food
b. I would not be able to pay rent/living expenses
c. I would not be able to fully pay my bills
d. I would have to put off buying something I was saving for
e. I would not be affected

5. If you know it, please give an estimated range of your credit score.

a. 200-300
b. 300-400
c. 400-500
d. 500-600

Table 22: Outcome: Earnings$_{is}$ ($)
(Not Controlling for Participant Demographics)

	(1)	(2)	(3)	(4)
Any PLSA	-0.5718***	-0.5817***		
	(0.1887)	(0.1870)		
Second		-0.3504*		-0.3529*
		(0.1846)		(0.1840)
High Prize PLSA			-0.3889*	-0.3971*
			(0.2168)	(0.2147)
Low Prize PLSA			-0.7620***	-0.7738***
			(0.2345)	(0.2333)
Constant	4.1667***	4.3483***	4.1667***	4.3496***
	(0.1518)	(0.1778)	(0.1519)	(0.1777)
N	3140	3140	3140	3140

Table 22: Results from estimating Equation 5. The outcome variable is Earnings$_{is}$: participant i's earnings in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. Second is an indicator that equals one if the data comes from the second game played by the participant during the session to control for learning and order effects. Column 1 estimates the model without controlling for learning effects, and Column 2 controls for learning effects. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 3 and 4 break up the variable PLSA to control for the size of the PLSA prize.
The model in this table does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

e. 600-700
f. 700-800
g. 800-900
h. I do not know my credit score

6. Please give an estimated range of your annual income. This includes wages from a job, money from family, and gifts.

Table 23: Outcome: Earnings$_{is}$ ($)
(Data from First Sequence Only)

	(1)	(2)
Any PLSA	-0.7664***	
	(0.2661)	
High Prize PLSA		-0.5318*
		(0.3061)
Low Prize PLSA		-1.0011***
		(0.3061)
Constant	6.1080***	6.2457***
	(0.2933)	(0.3287)
N	1570	1570

Table 23: Results from estimating Equation 5. The outcome variable is Earnings$_{is}$: participant i's earnings in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize. The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

a. $0 - $5,000
b. $5,001 - $10,000
c. $10,001 - $20,000
d. $20,001 - $40,000
e. $40,001 - $60,000
f. $60,001 - $100,000
g. $100,001 +

7. In the past year, have you skipped or postponed any of the following medical treatments due to cost? You may check multiple answers.

    a. Seeing a general care doctor

Table 24: Outcome: Earnings$_{is}$ ($)
(Data from Second Sequence Only)

	(1)	(2)
Any PLSA	-0.4234	
	(0.2982)	
High Prize PLSA		-0.2552
		(0.3368)
Low Prize PLSA		-0.6010
		(0.3745)
Constant	3.6670***	3.7821***
	(0.7041)	(0.6787)
N	1570	1570

Table 24: Results from estimating Equation 5. The outcome variable is Earnings$_{is}$: participant i's earnings in experimental session s. PLSA is an indicator variable for whether the participant has access to a PLSA. PLSA High and PLSA Low are indicator variables that equal one if the PLSA prize is 120 tokens or 60 tokens, respectively. Columns 1 and 2 break up the variable PLSA to control for the size of the PLSA prize. The model in this table also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Standard errors in parentheses are clustered at the participant level.
(*) $p < 0.10$; (**) $p < 0.05$; (***) $p < 0.01$

b. Seeing a specialist
c. Mental health / Counseling
d. Dental care
e. Follow-up care
f. Prescription medicine

8. How are you paying for college? You may check multiple answers.

a. Parents
b. Self - pay (working part time)
c. Self - pay (working full time)
d. Student loans

Figure 12: Average MPC Error by Treatment
(Not Controlling for Participant Demographics)

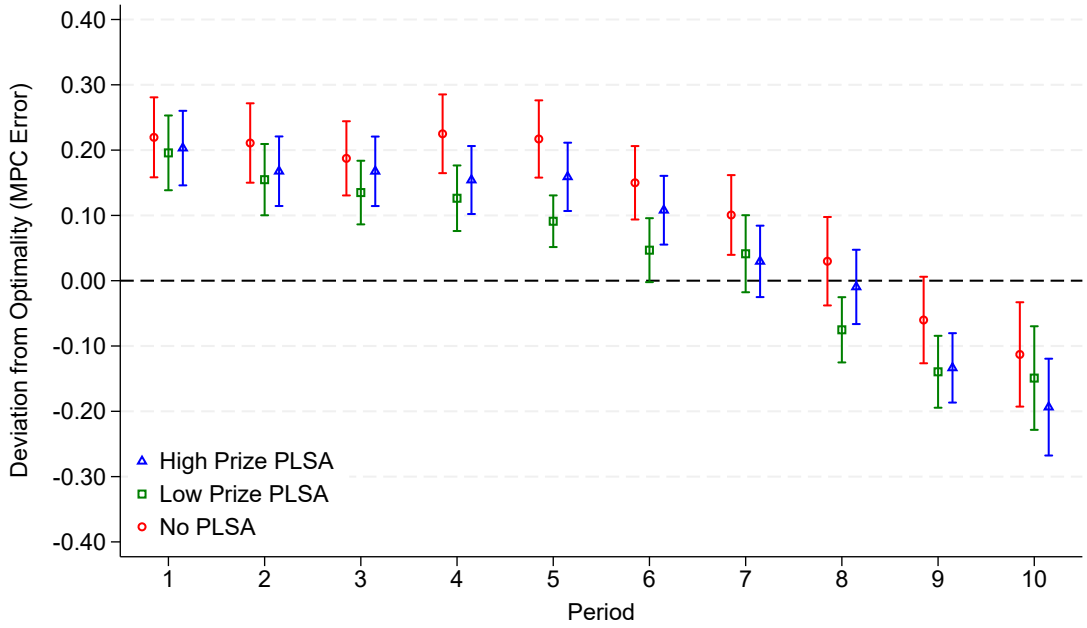


Figure 12: Average error in the participants' marginal propensity to consume (MPC Error) by period. Positive error represents over-consumption, and negative error represents under-consumption. Participants generally overconsumed early in the experiment, then, on average, moved closer to the optimal path.
The model in this figure does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

e. Scholarship

Part 4: About yourself

1. What is your age?
2. How do you describe yourself?
   a. Male
   b. Female
   c. Transgender
   d. Do not identify myself as female, male, or transgender
3. What is your academic major?
4. What is your current student classification?
   a. Freshman

Figure 13: Average MPC Error by Treatment
(Data from First Sequence Only)

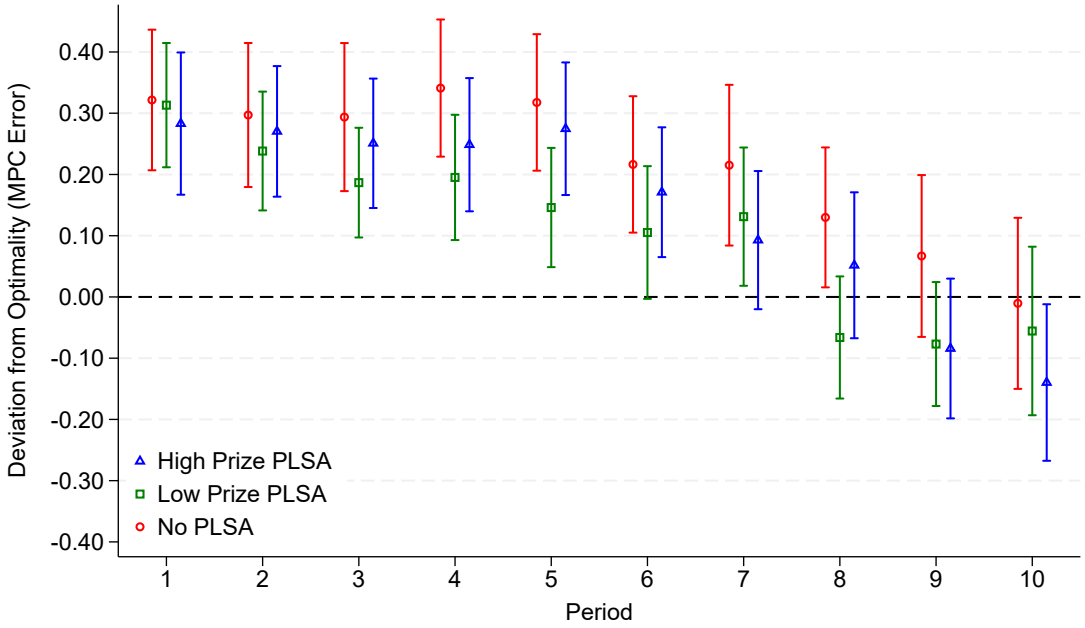


Figure 13: Average error in the participants' marginal propensity to consume (MPC Error) by period. Positive error represents over-consumption, and negative error represents under-consumption. Participants generally overconsumed early in the experiment, then, on average, moved closer to the optimal path.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

b. Sophomore
c. Junior
d. Senior
e. Master's Student
f. Law Student
g. Doctoral Student
h. Other

5. What is your student status?

a. Full-time student
b. Part-time student
c. Not a student

6. In what range is your cumulative GPA?

Figure 14: Average MPC Error by Treatment
(Data from Second Sequence Only)

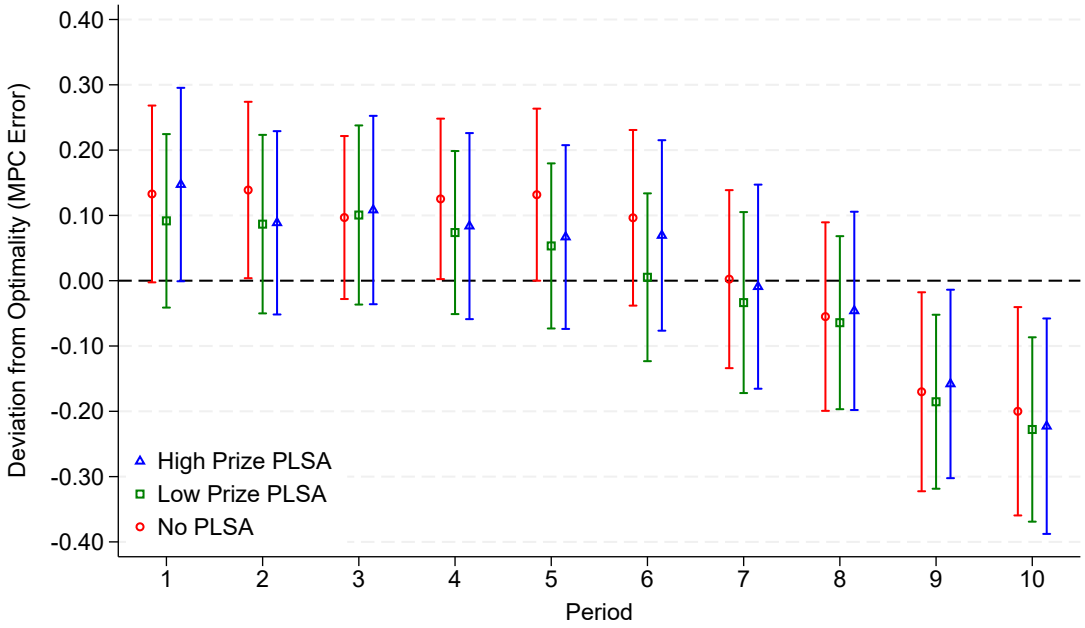


Figure 14: Average error in the participants' marginal propensity to consume (MPC Error) by period. Positive error represents over-consumption, and negative error represents under-consumption. Participants generally overconsumed early in the experiment, then, on average, moved closer to the optimal path.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

a. 0 to 2.0
b. 2.1 to 2.
c. 2.6 to 3.0
d. 3.1 to 3.5
e. 3.6 to 4.0

7. How many economics courses have you completed at the university level?

8. How would you best describe your current employment status?

a. Employed Full-Time
b. Employed Part-Time
c. Self-Employed Full-Time
d. Self-Employed Part-Time
e. Unemployed

Figure 15: Average |MPC Error| by Treatment
(Not Controlling for Participant Demographics)

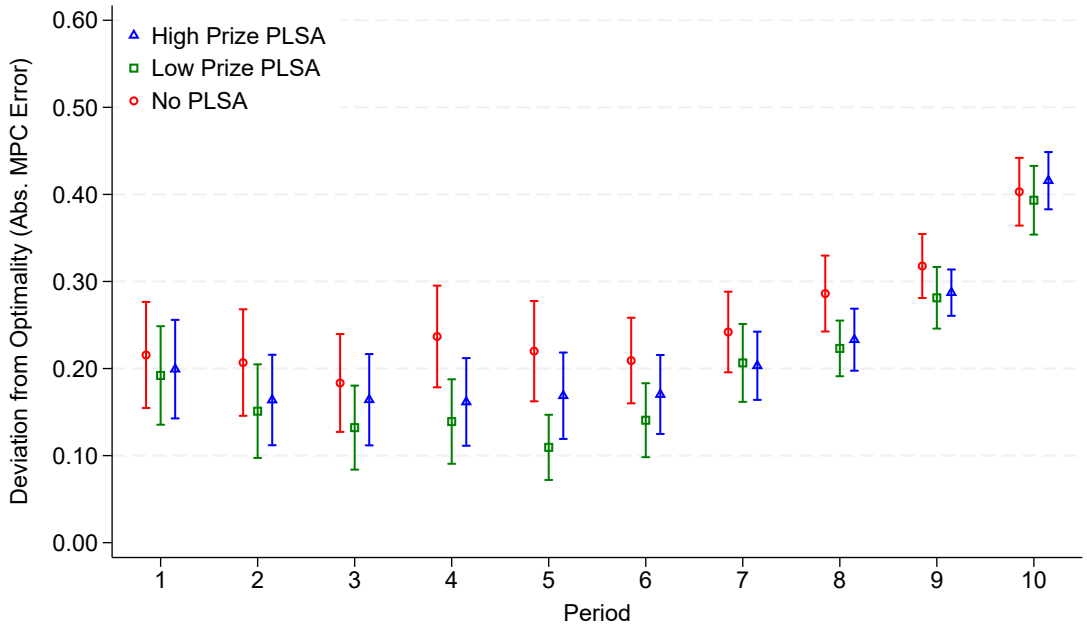


Figure 15: Average absolute error in the participants' marginal propensity to consume (MPC Error) by period. This figure shows the general deviations from optimality of participants in the experiment. Participants deviated further from optimality in later periods.
The model in this figure does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

9. Please use the following space to write any comments (positive or negative) you may have about the experiment.

Figure 16: Average |MPC Error| by Treatment
(Data from First Sequence Only)

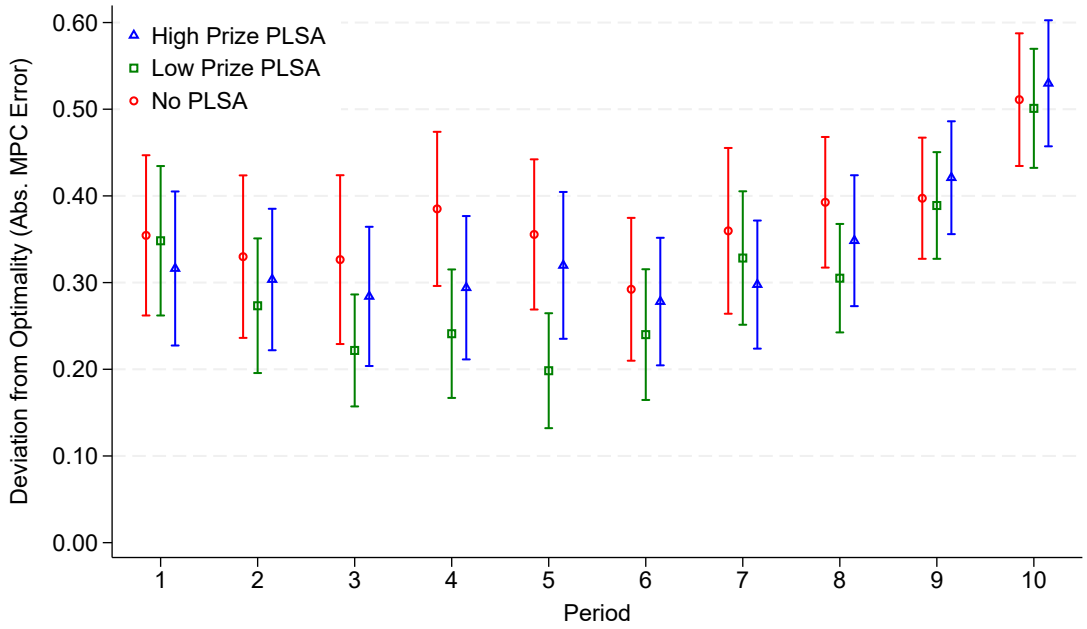


Figure 16: Average absolute error in the participants' marginal propensity to consume (MPC Error) by period. This figure shows the general deviations from optimality of participants in the experiment. Participants deviated further from optimality in later periods.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

6.4 Screenshots of the Experiment

Figure 17: Average |MPC Error| by Treatment
(Data from Second Sequence Only)

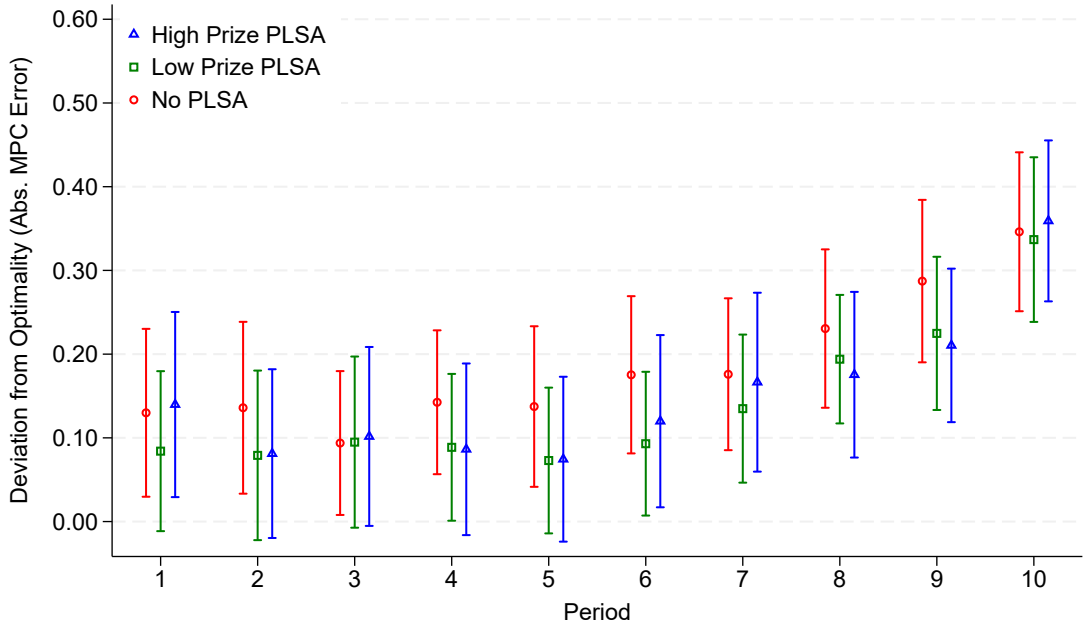


Figure 17: Average absolute error in the participants' marginal propensity to consume (MPC Error) by period. This figure shows the general deviations from optimality of participants in the experiment. Participants deviated further from optimality in later periods.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

Figure 18: Effect of Unexpected Expense on Assets
(Not Controlling for Participant Demographics)

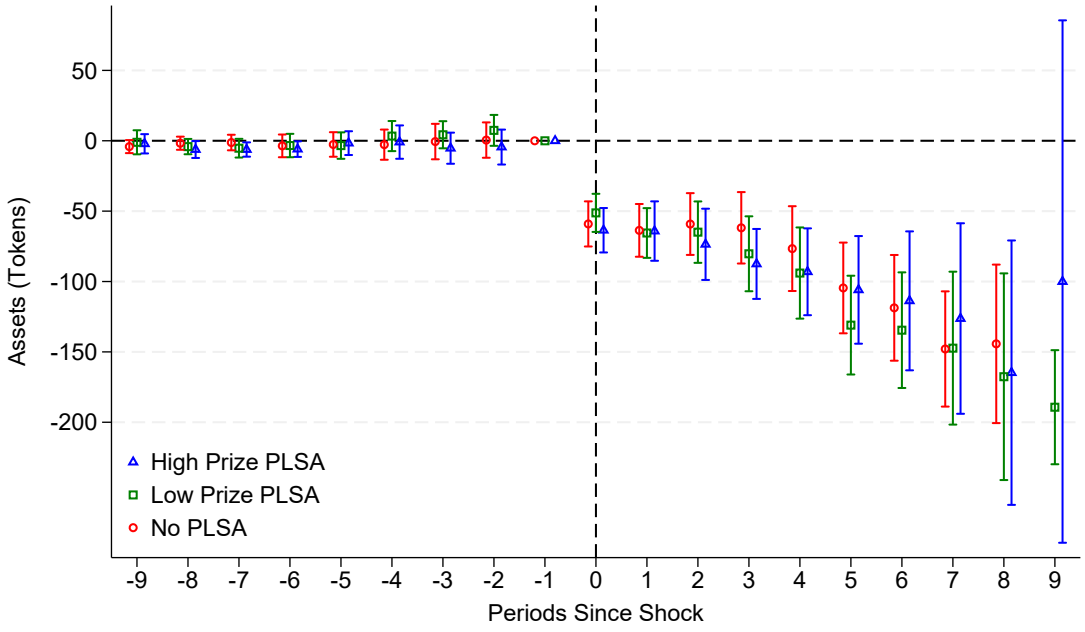


Figure 18: This event study graph shows the effect of incurring the Unexpected Expense on the participant's assets. The event study model includes period fixed effects to demean the predictably parabolic time trend of a subject's assets from compound interest.
The model in this figure does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

Figure 19: Effect of Unexpected Expense on Assets
(Data from First Sequence Only)

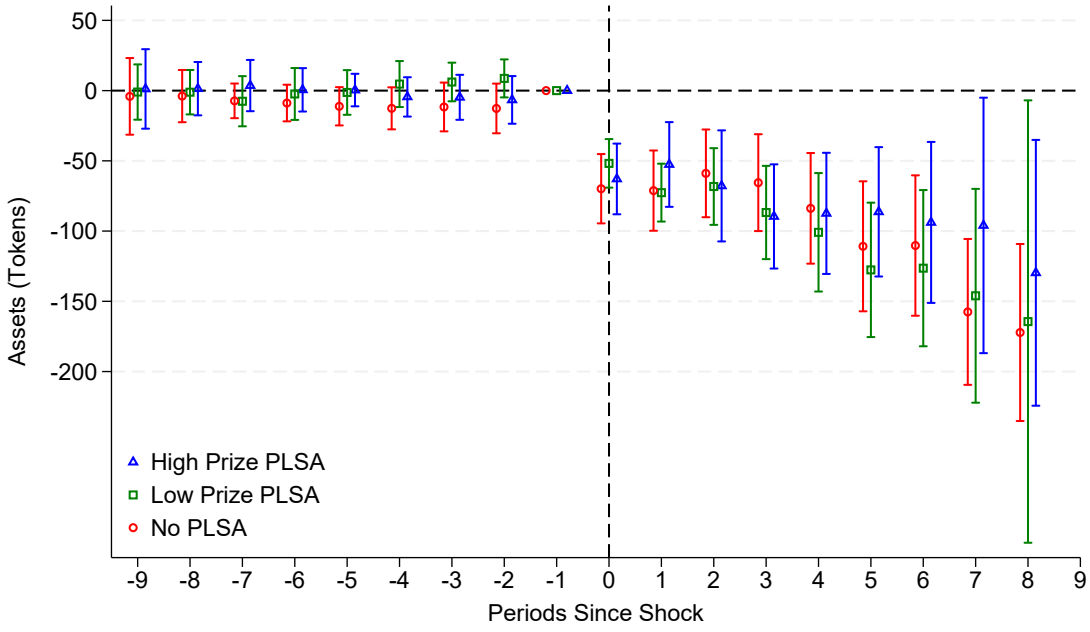


Figure 19: This event study graph shows the effect of incurring the Unexpected Expense on the participant's assets. The event study model includes period fixed effects to demean the predictably parabolic time trend of a subject's assets from compound interest.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

Figure 20: Effect of Unexpected Expense on Assets
(Data from Second Sequence Only)

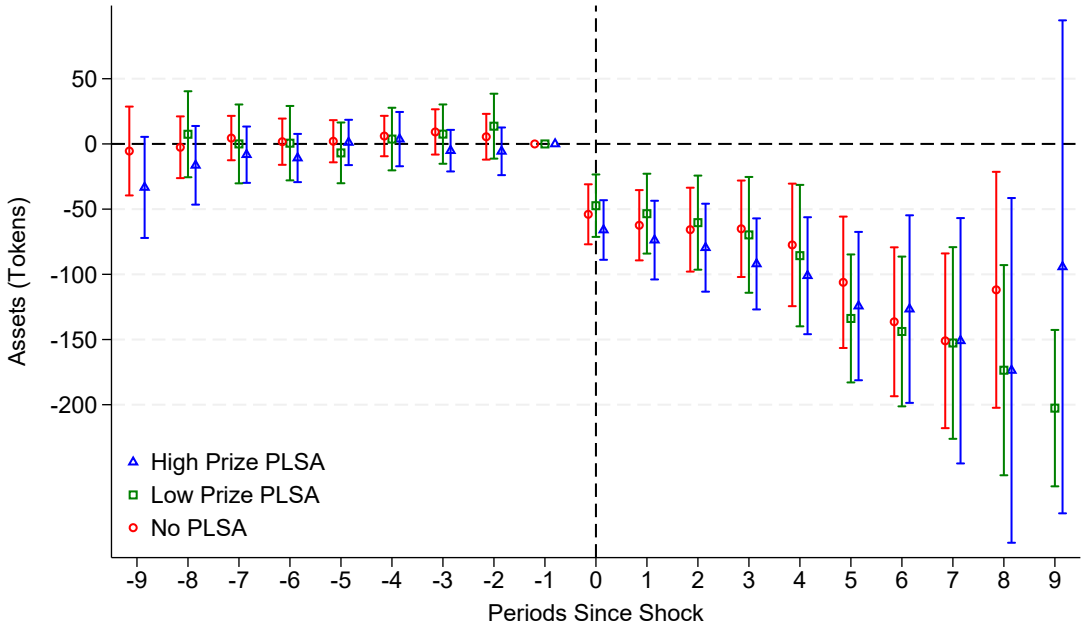


Figure 20: This event study graph shows the effect of incurring the Unexpected Expense on the participant's assets. The event study model includes period fixed effects to demean the predictably parabolic time trend of a subject's assets from compound interest.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
The confidence intervals shown are at the 95 percent level.

Figure 21: Effect of Unexpected Expense on Optimal Consumption
(Not Controlling for Participant Demographics)

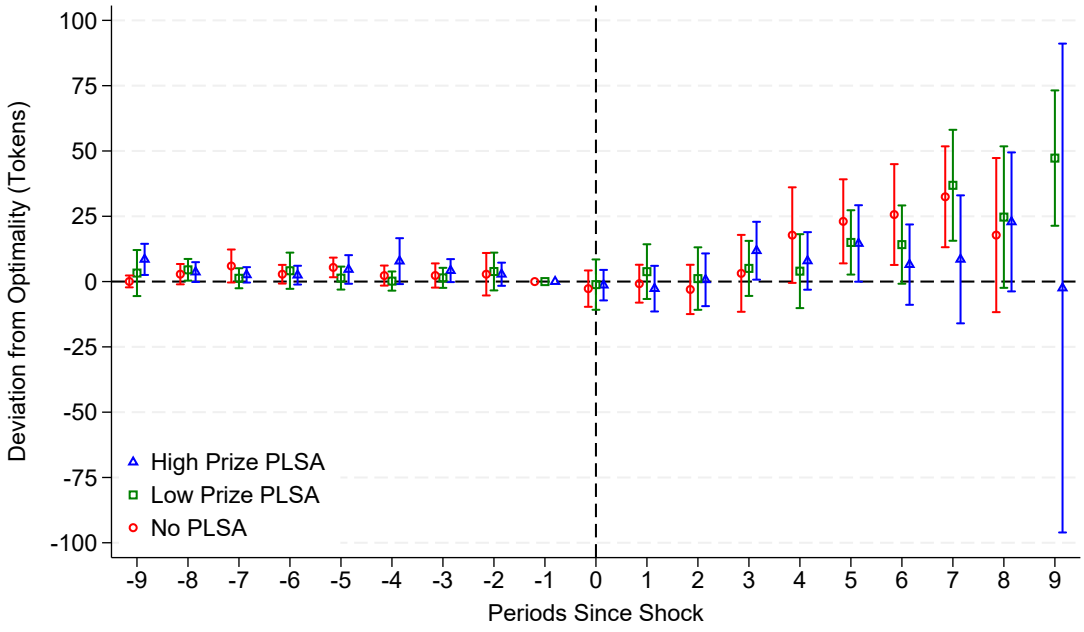


Figure 21: This event study graph shows the effect of incurring the Unexpected Expense on the participant's deviations from optimal consumption. A positive amount of tokens represents over-consumption, and a negative amount of tokens represents under-consumption.
The model in this figure does not control for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Confidence intervals shown are at the 95 percent level.

Figure 22: Effect of Unexpected Expense on Optimal Consumption
(Data from First Sequence Only)

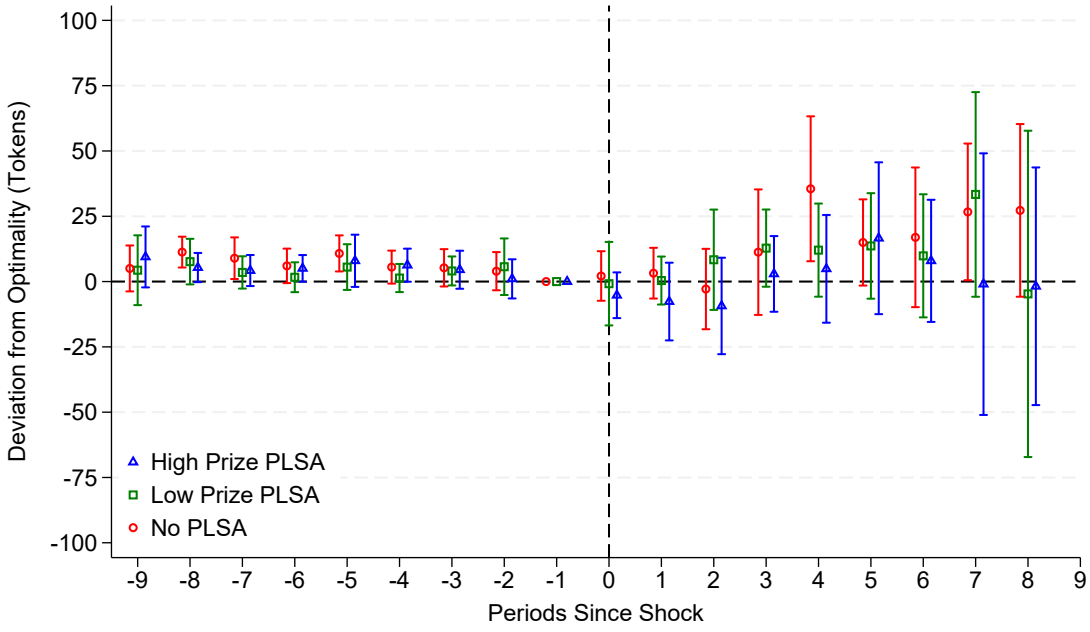


Figure 22: This event study graph shows the effect of incurring the Unexpected Expense on the participant's deviations from optimal consumption. A positive amount of tokens represents over-consumption, and a negative amount of tokens represents under-consumption.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Confidence intervals shown are at the 95 percent level.

Figure 23: Effect of Unexpected Expense on Optimal Consumption
(Data from Second Sequence Only)

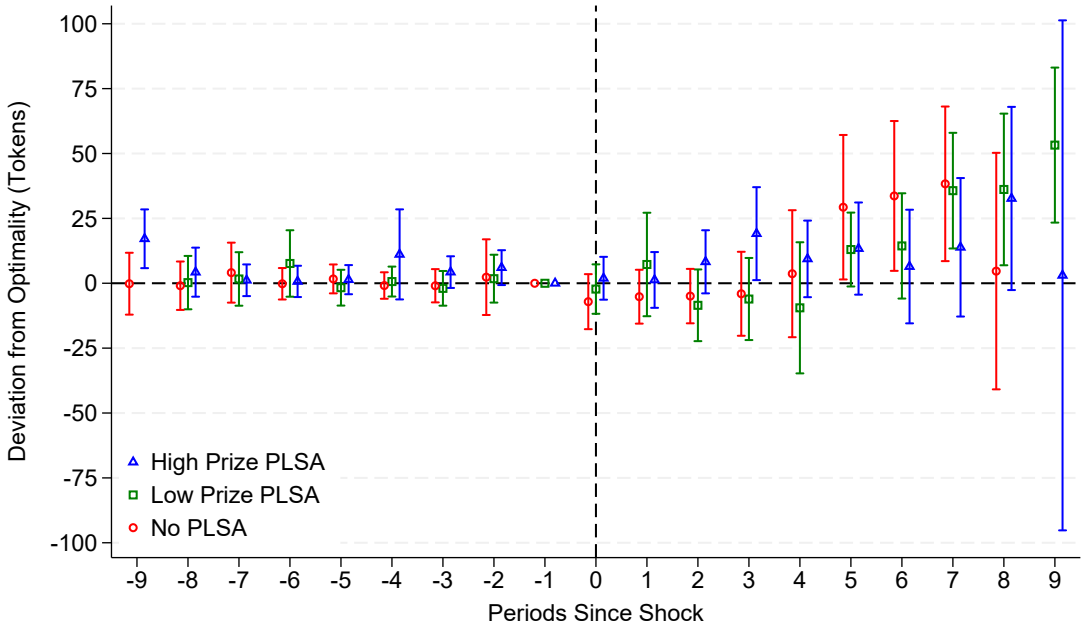


Figure 23: This event study graph shows the effect of incurring the Unexpected Expense on the participant's deviations from optimal consumption. A positive amount of tokens represents over-consumption, and a negative amount of tokens represents under-consumption.
The model in this figure also controls for participant characteristics: gender, GPA, year (freshman, sophomore, etc.), and income.
Confidence intervals shown are at the 95 percent level.

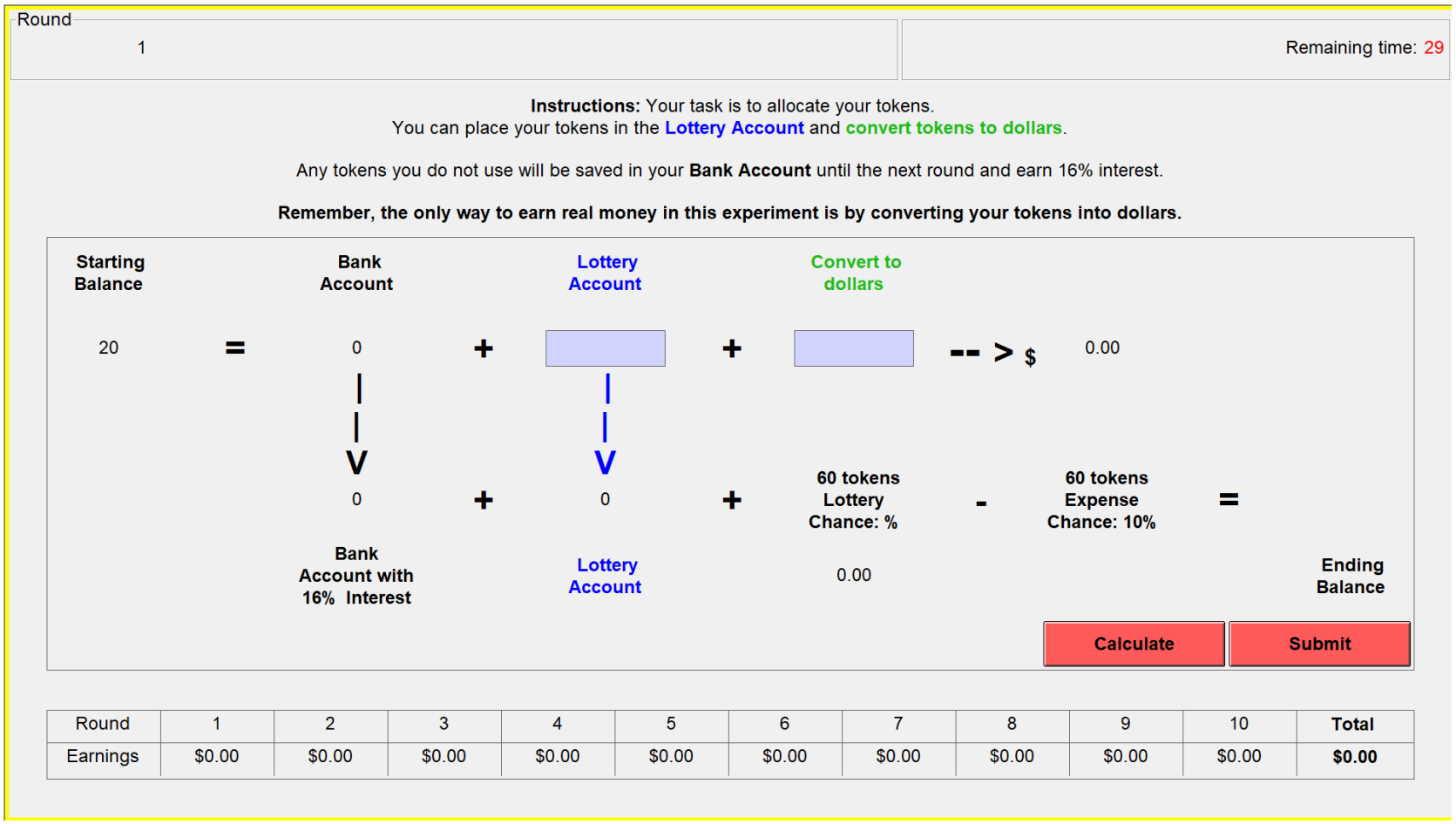


Figure 24: Starting Screen: This is the screen the participant would see when asked to input her decisions. The participant can choose between the Bank Account, the Lottery Account, or Convert to Dollars. Clicking Calculate will show the participant the projected interest she will earn on her Bank Account and her probability of winning the Lottery Prize.

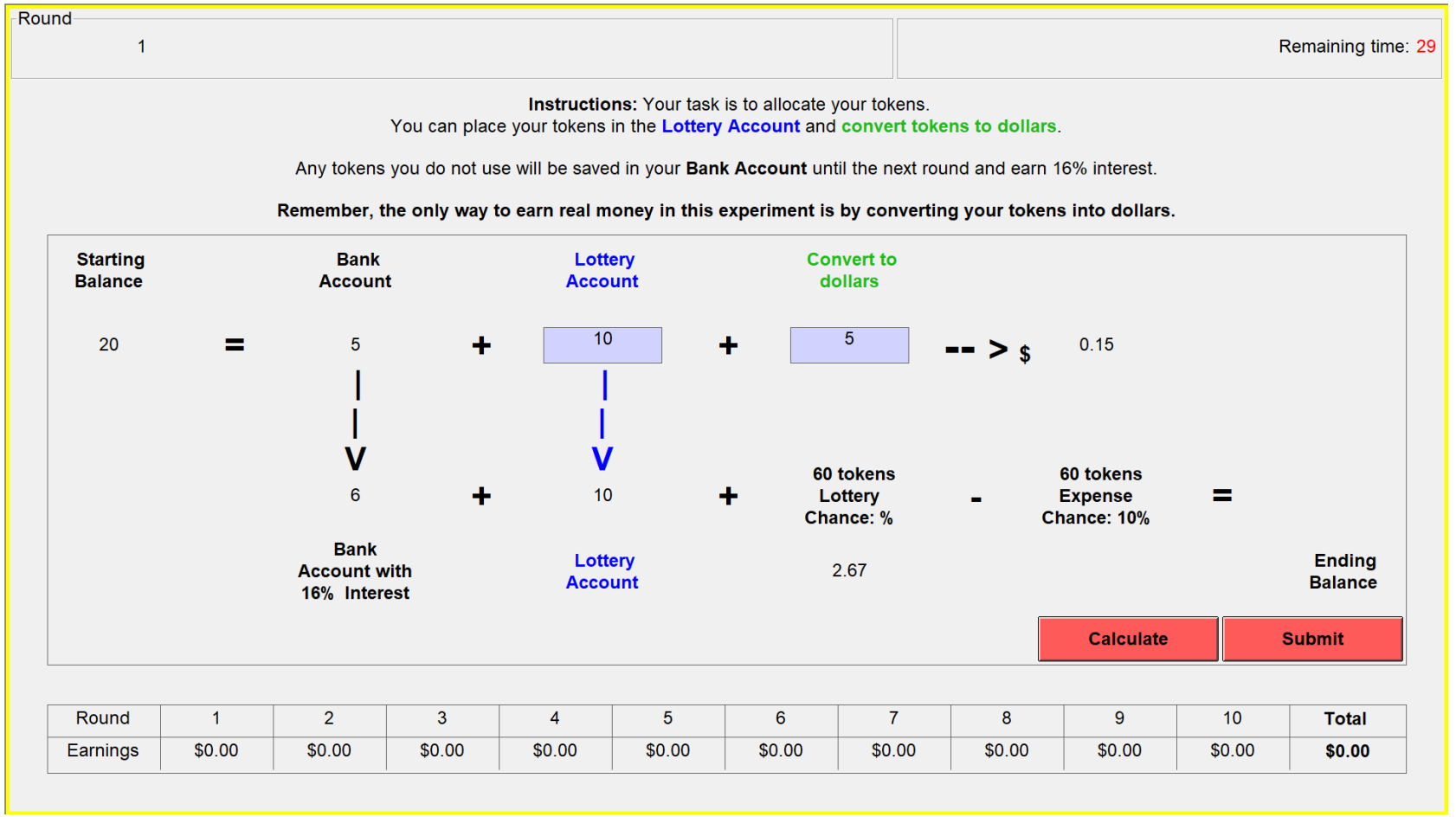
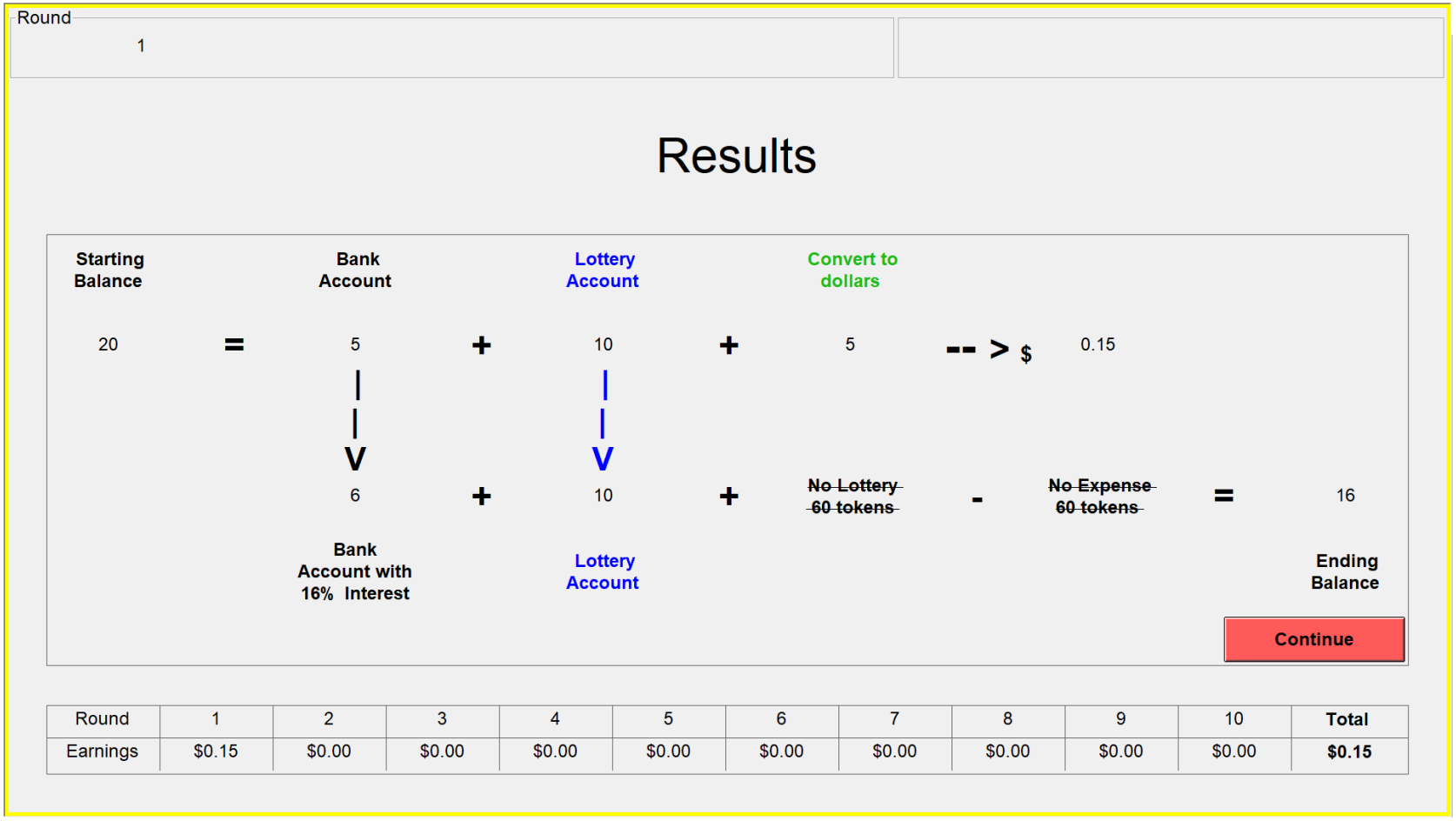
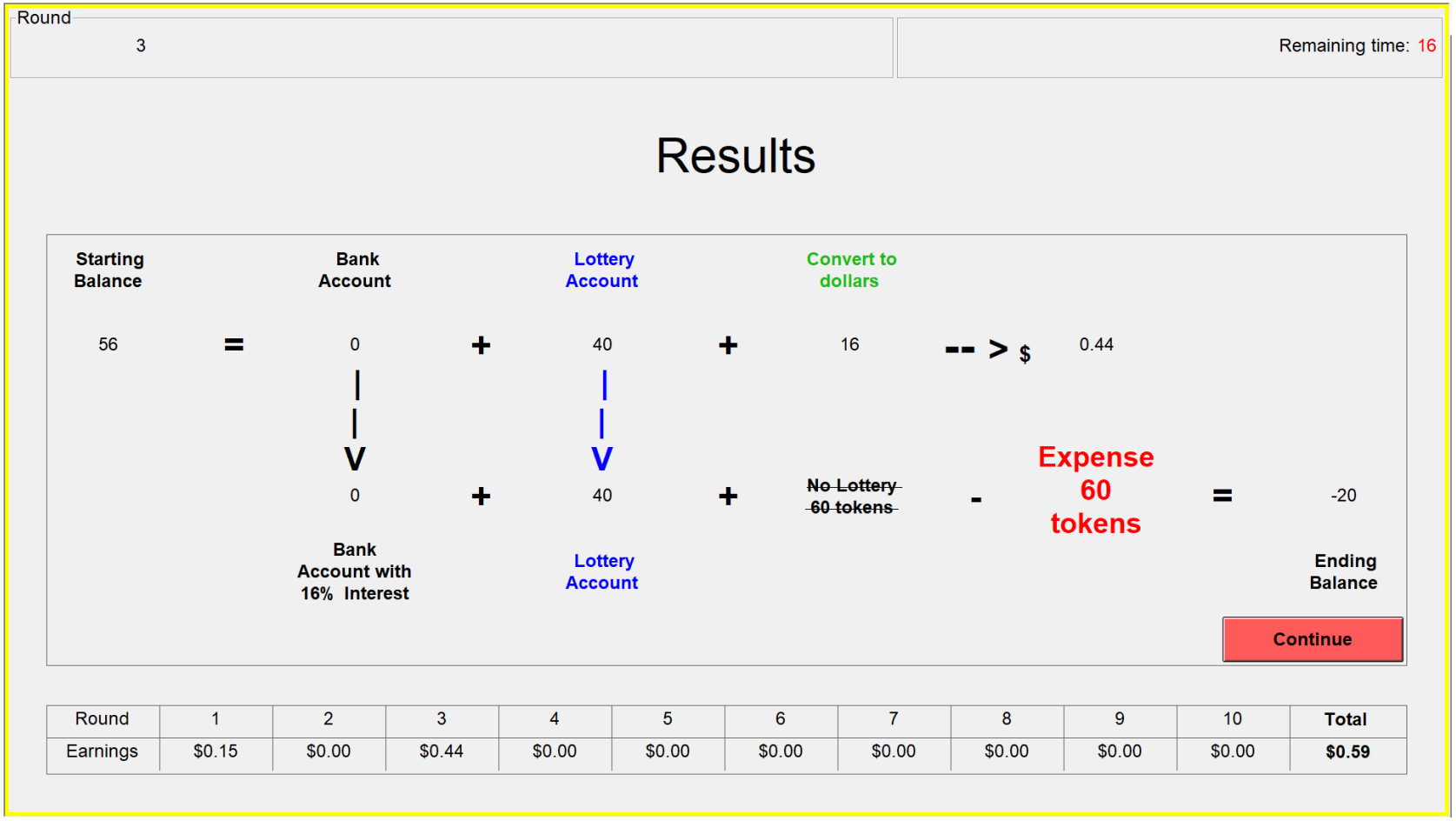


Figure 25: Choices: The participant has chosen to allocate ten tokens to the Lottery Account and convert five tokens into $0.15. This leaves five tokens in her Bank Account, which will increase to six in the next period.



Round	1	2	3	4	5	6	7	8	9	10	**Total**
Earnings	$0.15	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.15**

Figure 26: Results: The participant has clicked Submit, and she can now see the results of her choices. She did not win the Lottery Prize, and she did not incur the Expense. In the next period, the participant would be given the six tokens in her Bank Account, the ten tokens in her Lottery Account, and another income of 20 tokens.



Round	1	2	3	4	5	6	7	8	9	10	Total
Earnings	$0.15	$0.00	$0.44	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	**$0.59**

Figure 27: Expense: This screen shows that the participant has been shocked with the Unexpected Expense. She must pay sixty tokens. Because she only has forty tokens, she is in debt by twenty tokens. In the next period, she would be given another income of twenty tokens, which would be used to pay off her debt.

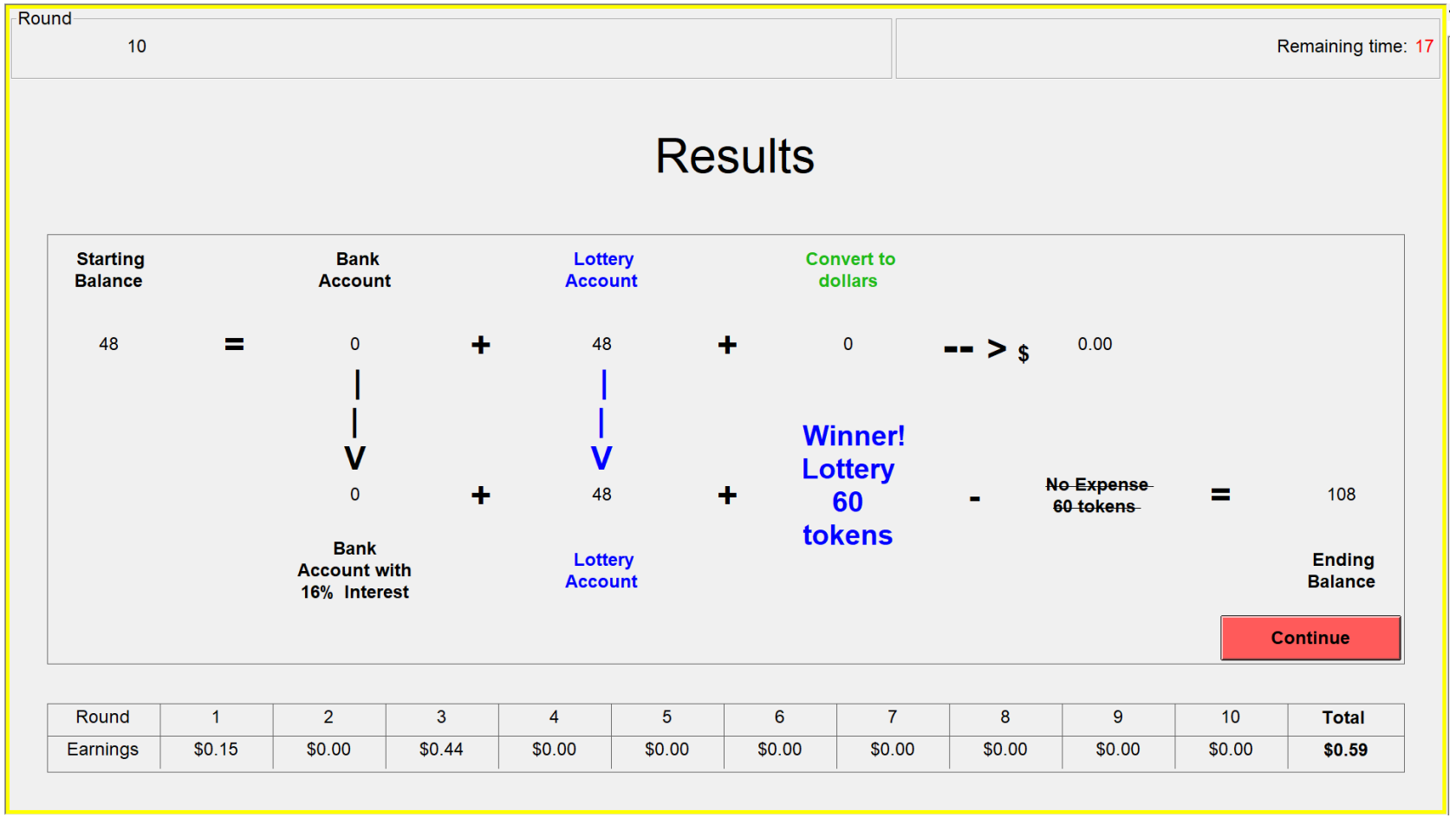


Figure 28: Lottery Prize: This screen shows that the participant has won the Lottery Prize. Sixty tokens will be added to her balance in the next period.