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

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SEA 2025

Household Liquidity Constraints

A Trip to the ER

- Nearly two-fifths of U.S. adults report inability to access $2,000 within one month

  FED Survey, (2025)

- Households may make suboptimal financial decisions: asset liquidation, high-interest borrowing, reducing consumption

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Credit markets costly or inaccessible:

- Limited access, adverse credit ratings, predatory lending
- Example: Tennessee Flex Loans charge 279.5% interest

Why don't households save more?

Determinants of insufficient savings:

- High discount rates (present bias)
- Low risk aversion
- External income constraints
- Serially correlated shocks (bad luck)
- Financial illiteracy

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Behavioral Intervention: Prize-Linked Savings Accounts

Design:

- Deposits function as lottery entries with stochastic returns
- Principal protected – "no-lose lottery"
- Win probability proportional to deposit

Target population:

- Individuals with high discount rates, low risk aversion
- Legal in 33 U.S. states following 2014 American Savings Promotion Act

Ambiguous Ex-Ante Effects on Total Saving

Benefits:

- Increased savings participation among under-savers
- Enhanced behavioral engagement
- **Appealling to the most vulnerable houeholds**

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- Foregone compound interest
- **Portfolio substitution without net savings increase**

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Research Question: Does access to a PLSA increase total precautionary savings for households facing financial shocks?

Preview of Results

PLSAs cause portfolio substitution without increasing total savings.

1. **Crowding out** traditional savings by 33.6–38.5%
   - Risk-seeking participants: 93.7% crowd out
2. **No net savings increase** for any risk preference group
3. **Earnings decline** 9.1–17.8% from foregone compound interest

We already know:

- PLSAs substitute for standard savings and lottery purchases Jindapon et al., (*GEB*, 2022); Filiz-Ozbay et al. (*J. Pub. Econ*, 2015)
- PLSAs can increase total savings among unbanked households Gertler et al, (*NBER WP*, 2023)

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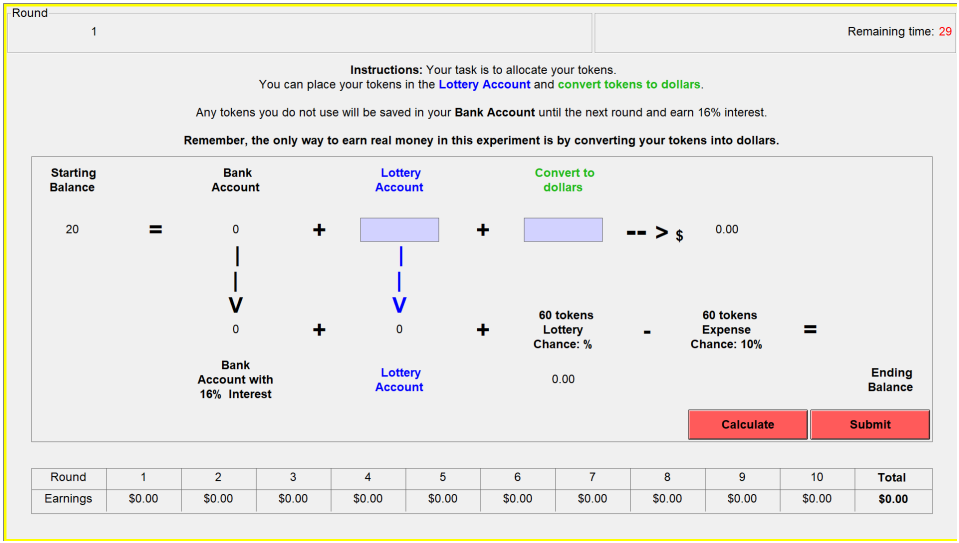
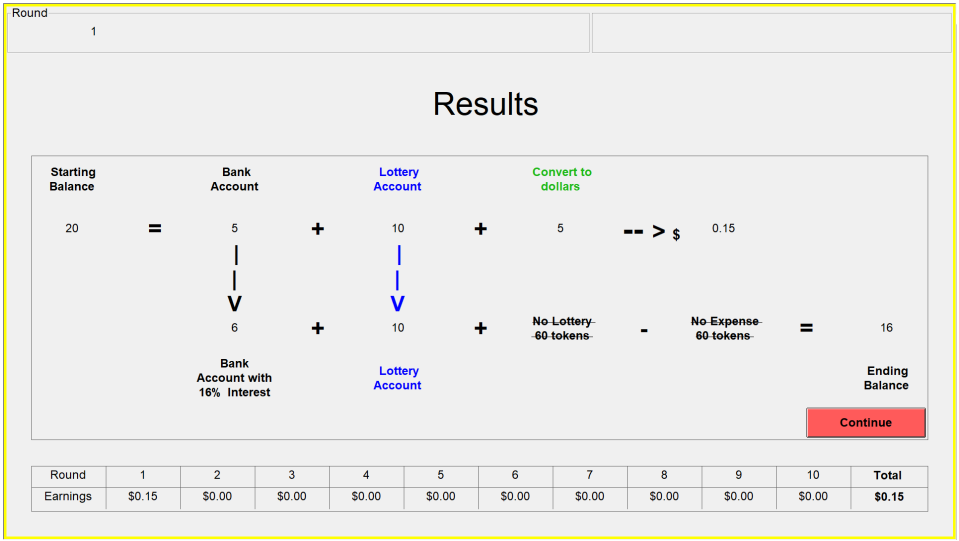
This paper:

- Heterogeneous treatment effects by risk preference
- First test of PLSA crowding out for *very high-yield* savings (16%)



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



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**

Experimental Design

- Dynamic life-cycle framework: 10 periods, each prticipant plays two treatments
- Exog. income 20 tokens per period
- Portfolio allocation: consumption, bank savings (16%), or PLSA CARA Utility
- Shock: 10% probability of 60-token expense per period
- PLSA expected return equals bank account (16%)

All Parameters Why an experiment?

Experimental Design

Three within-subject treatments:

- Control: No PLSA access
- High-prize PLSA: 120-token prize
- Low-prize PLSA: 60-token prize

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Session Type	N
No Prize/High Prize	56
High Prize/Low Prize	49
No Prize/Low Prize	52
Total	**157**

Summary Statistics

	Mean	St. Dev.	Min.	Max
Standard Savings	57.62	85.19	-294	624
PLSA Savings	20.82	58.43	0	680
Tokens Consumed	9.92	26.81	0	455
Shock Incurred	0.09	0.29	0	1
Female	0.52	0.50	0	1
Observations	3140			

Estimating Equation

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

$$\text{where Outcome}_{ist} \in \left\{ \begin{array}{l} \text{Bank Savings}_{ist} \\ \text{Bank + PLSA Savings}_{ist} \\ \text{Earnings}_{is} \\ |\text{MPC Error}_{ist}| \end{array} \right\}$$

Crowding Out Bank Savings

- Bank account savings decline 33.6–38.5%
- **Risk-seeking**: 93.7% crowding out
- **Risk-averse**: 30.4–40.3% crowding out

	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

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No Increase in Total Savings

- Total savings unchanged
- PLSAs induce **portfolio reallocation** without increasing savings

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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)
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Lower Earnings from Foregone Returns

- Realized earnings decline 9.1–17.8%
- Opportunity cost: foregone compound interest
- Utility from lottrry experience must compensate

	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)
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Summary of findings:

- PLSAs crowd out bank savings by 33.6–38.5%, total savings are unchanged
- **Stronger effect on risk-seeking individuals**
- Earnings decline 9.1–17.8% from foregone returns

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Policy implications:

- **For Banks:** PLSAs can increase profit; crowd-out is sensitive to size of prize
- **For Gov't:** PLSAs appeal to the most vulnerable households
- **Overall: PLSAs are most profitable and engaging when marketed towards risk-seeking, unbanked households.**

Thank You!

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Why use a lab experiment?

- Observational data limitations:
  - Identification of exogenous shocks problematic
  - Complete household portfolio allocation unobserved
- Experimental advantages:
  - Random treatment assignment ensures exogeneity
  - Precise parameterization of choice environment
  - Full observability of portfolio decisions

Back

Tokens	Dollars	Tokens	Dollars	Tokens	Dollars
10	$ 0.29	110	$ 2.00	210	$ 2.63
20	$ 0.54	120	$ 2.10	220	$ 2.67
30	$ 0.78	130	$ 2.18	230	$ 2.70
40	$ 0.99	140	$ 2.26	240	$ 2.73
50	$ 1.18	150	$ 2.33	250	$ 2.75
60	$ 1.35	160	$ 2.39	260	$ 2.78
70	$ 1.51	170	$ 2.45	270	$ 2.80
80	$ 1.65	180	$ 2.50	280	$ 2.82
90	$ 1.78	190	$ 2.55	290	$ 2.83
100	$ 1.90	200	$ 2.59	300	$ 2.85

Back

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

Back

Enhanced Consumption Smoothing

- Consumption 13.1–19.2% closer to optimal
- **Risk-seeking**: 52.2–60.6% improvement
- **Risk-averse**: Null effect

	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