Discussion of "Liquidity Requirements and the Interbank Loan Market: An Experimental Study"

Gabriele Camera

ESI, Chapman University

& University of Bologna

Money and Finance Conference, Chapman University, September 2019

ROADMAP FOR THE NEXT 10-15 MINUTES

1. Contribution of this paper

2. Methodology: experimental eye for the monetary guy

CONTRIBUTION OF THIS PAPER

A REASON FOR LIQUIDITY REGULATION

A bank's liquidity has a private and a social value:

- Private: obvious risk-return tradeoff (bankruptcy or profit?).

- Social: my excess liquidity can become your lifeline on an interbank market.

Concern: if externality not fully internalized, liquidity is undersupplied.

Cure: impose minimum liquidity requirement to boost overall liquidity.

Study skillfully conducts an intriguing exploratory analysis of interbank markets.
(no specific H0)

REFERENCE THEORY

A coordination task based on a hybrid version of Gale and Yorulmazer (2013).

There is bankruptcy risk, and two strategies can dissipate it:

- Self-insurance: invest little, and hold lots of cash under the mattress.

- Mutual insurance: invest lots, hold some cash, and trade it on interbank market.

Assume: rational players, payoff-maximizing, risk-neutral, introspection abilities.

Many equilibria. So: strategic uncertainty & likely inefficiency.

Game finitely repeated but theory is one-shot (why?).

EXPERIMENTAL DESIGN

Framed experiment: 8 subjects (banks) must choose a portfolio.

Portfolio choice is a dynamic stochastic optimization problem:

- Fully anticipate a liquidity decline that will affect half of us.

- Additional liquidity decline possible that will affect two of the remaining four.

Treatments: liquidity requirement (yes/no) × shocks (one/two)

Trouble ahead: humans do not shine for their backward induction skills.

DATA ANALYSIS: MAIN TAKE-AWAYS

One-shock case – we expect NO insolvent bank

- Banks underinvest (too liquid) but bankruptcies happen (undersupply cash).

- Liquidity requirement drives down investment and bankruptcies–maybe good.

Two-shock case – expect either 0 or some insolvent bank, but hard to tell

- Banks overinvest (too illiquid) and bankruptcies too frequent (undersupply cash).

- Liquidity requirement drives down investment but more insolvencies

Message: Frictions get in the way of socially optimal liquidity (re)allocation.

These same frictions may cause liquidity regulation to backfire.

FRICTIONS: TRIPLE WHAMMY

- Inability to communicate to coordinate strategy (Cooper et al.)

- Dynamic problem solved in isolation w/out market price guidance (Noussair-Lei)

- No dynamic incentives via reputation or relational contracting (Camera-Casari)

Are these relevant characteristics of interbank markets?

Would be interesting to build on this work to explore these aspects.

Indeed: tacit coordination is tricky even in more mundane settings ...

SHOULD I STAY OR SHOULD I GO?

Players' interest are *perfectly aligned* here . . .

		Stay	Go
	Stay	90, 90	0, 0
me	Go	0, 0	120, 120

SHOULD I STAY OR SHOULD I GO?

Players' interest are *perfectly aligned* here . . .

		Stay	Go
me	Stay	90, 90	0, 0
	Go	0, 0	120, 120

. . . and here too, but an action is "safe."

		Stay	Go
me	Stay	90, 90	90, 0
	Go	0, 90	120, 120

A coordination institution (public?) seems valuable in case 2, not so in 1.

METHODOLOGY:

EXPERIMENTAL EYE FOR THE MONETARY GUY

WHY IS THIS METHODOLOGY VALUABLE?

No justification really needed here (Vernon Smith and ESI)

A useful, complementary approach to identify or test operating principles:

- *construct* economies with desired features & complexity

- *minimize* confounding factors & spillover effects

- *observe* variables that are unobservable in the field

- *measure* how shocks or policy changes affect endogenous variables

- *perform* counterfactual tests

- *develop* insight when field experience is limited/non-existent

In the next 5 mins. I'd like to give you an example about this last point.

HOW TO DESIGN A CBDC

1. Nowadays outside money has a marginal role

2. But talk of interest-paying CBDC makes for an interesting future
   (back to the future: Tobin's idea of *deposited currency* dates back to 1985)

How should a CBDC look like? Theory suggests desirable traits:

- interest-bearing, with rate unconstrained by any effective lower bound.
  (Bordo and Levin 2017)

Let's bring it to the lab: barren tokens versus tokens w/ penalties or premia.

A LAB SOCIETY THAT NEEDS MONEY TO FUNCTION

Experimental design with 8 players — producers and consumers.

Producers   Consumers

- Game: uncertain number of rounds (16+) with alternating roles.

- Mix participants into producer-consumer pairs in each round.

  ⇒ Planner wants consumers to eat, but producers suffer.

- Consumer has no goods to offer, but may have a token (visible).

  ⇒ Options: exchange a token, rely on implicit contract, or do nothing.

Efficient outcome is an equilibrium: no consumer ever goes hungry.

ACTIONS & PAYOFFS WITH "FIAT" TOKENS

Producer light, consumer dark. Points below figurines are representative for utility.

EXPERIMENT 1: WILL A MONETARY SYSTEM DEVELOP?

SUPPLY INITIAL CONSUMERS WITH ONE FIAT TOKEN

EFFICIENCY IMPROVES WITH EXPERIENCE
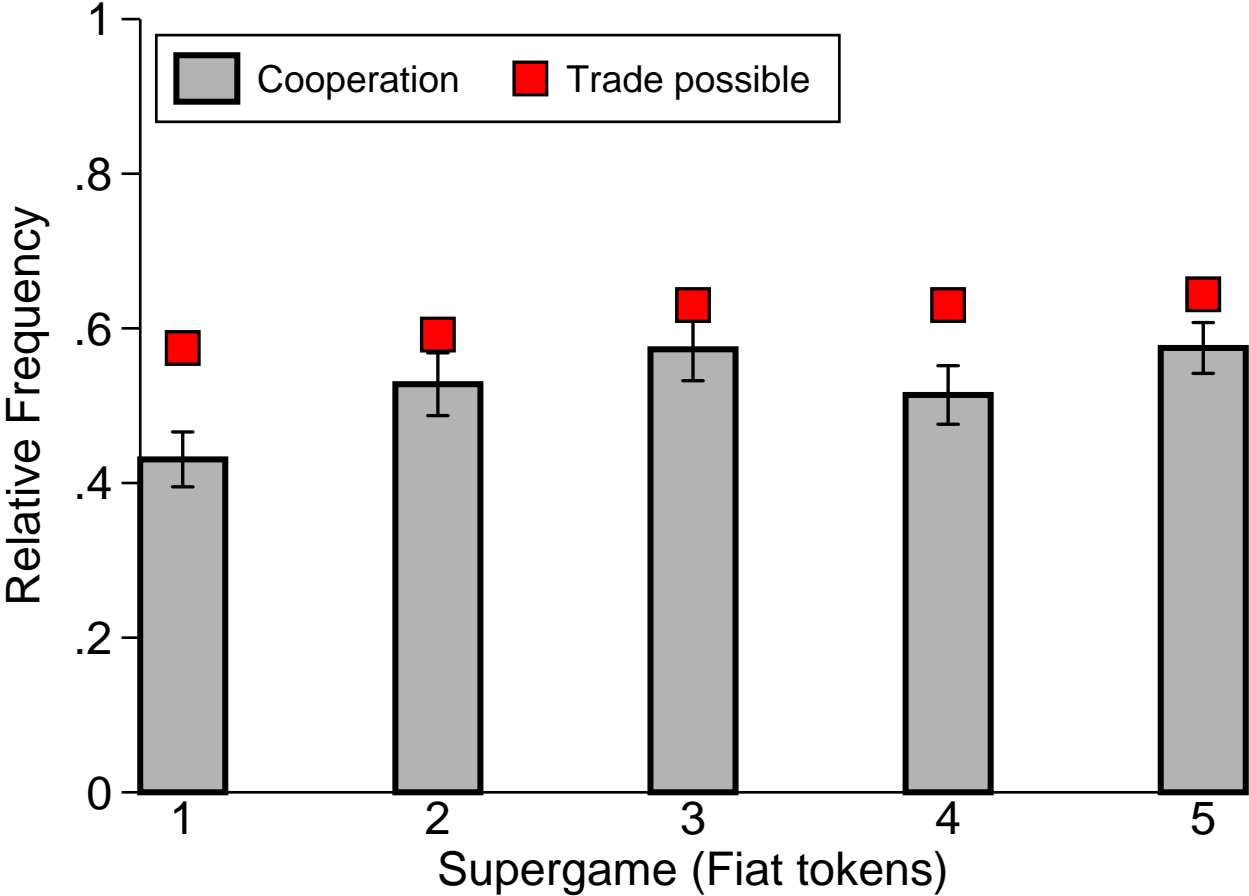
A MONETARY SYSTEM DEVELOPS OVER TIME
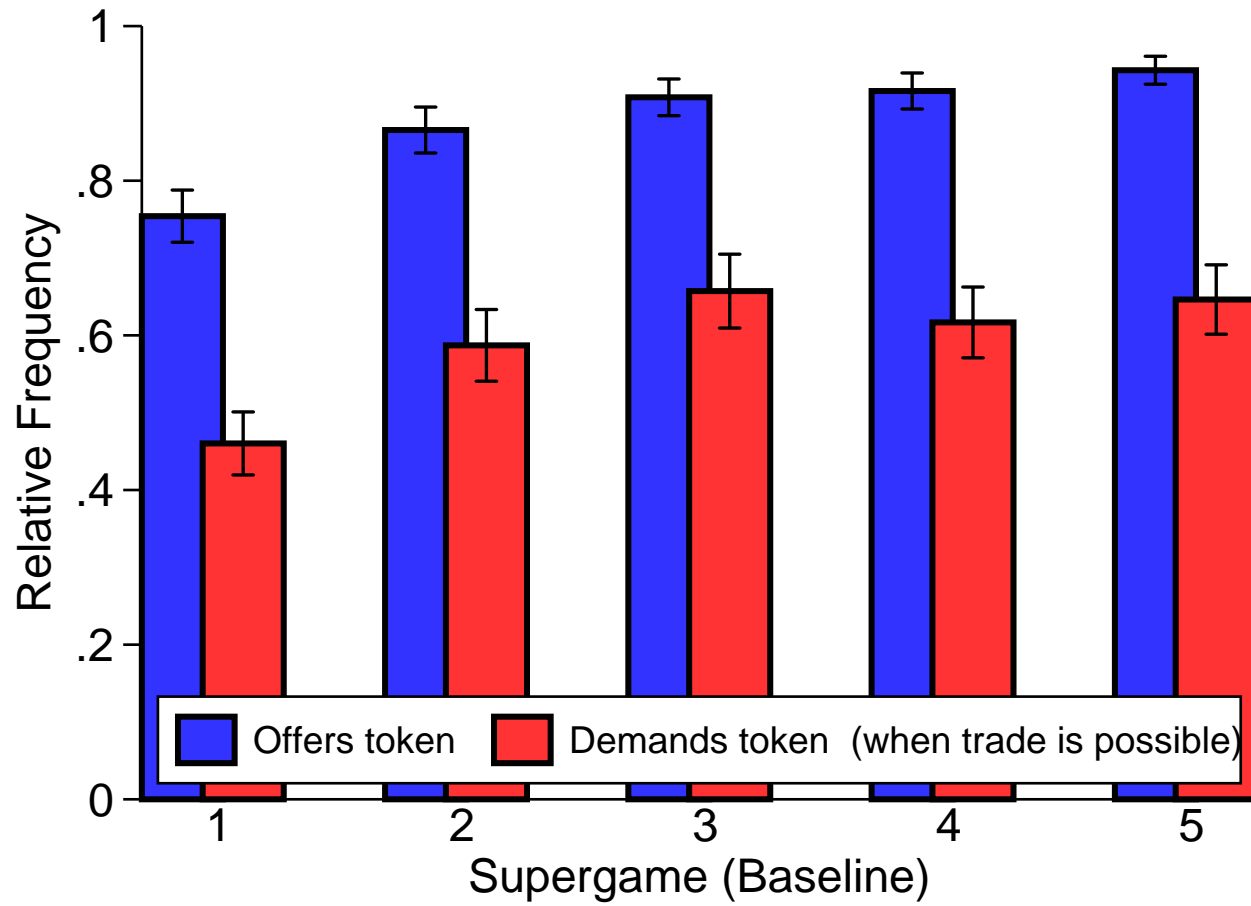
BELIEFS ABOUT FUTURE CIRCULATION/ACCPETABILITY MATTER!
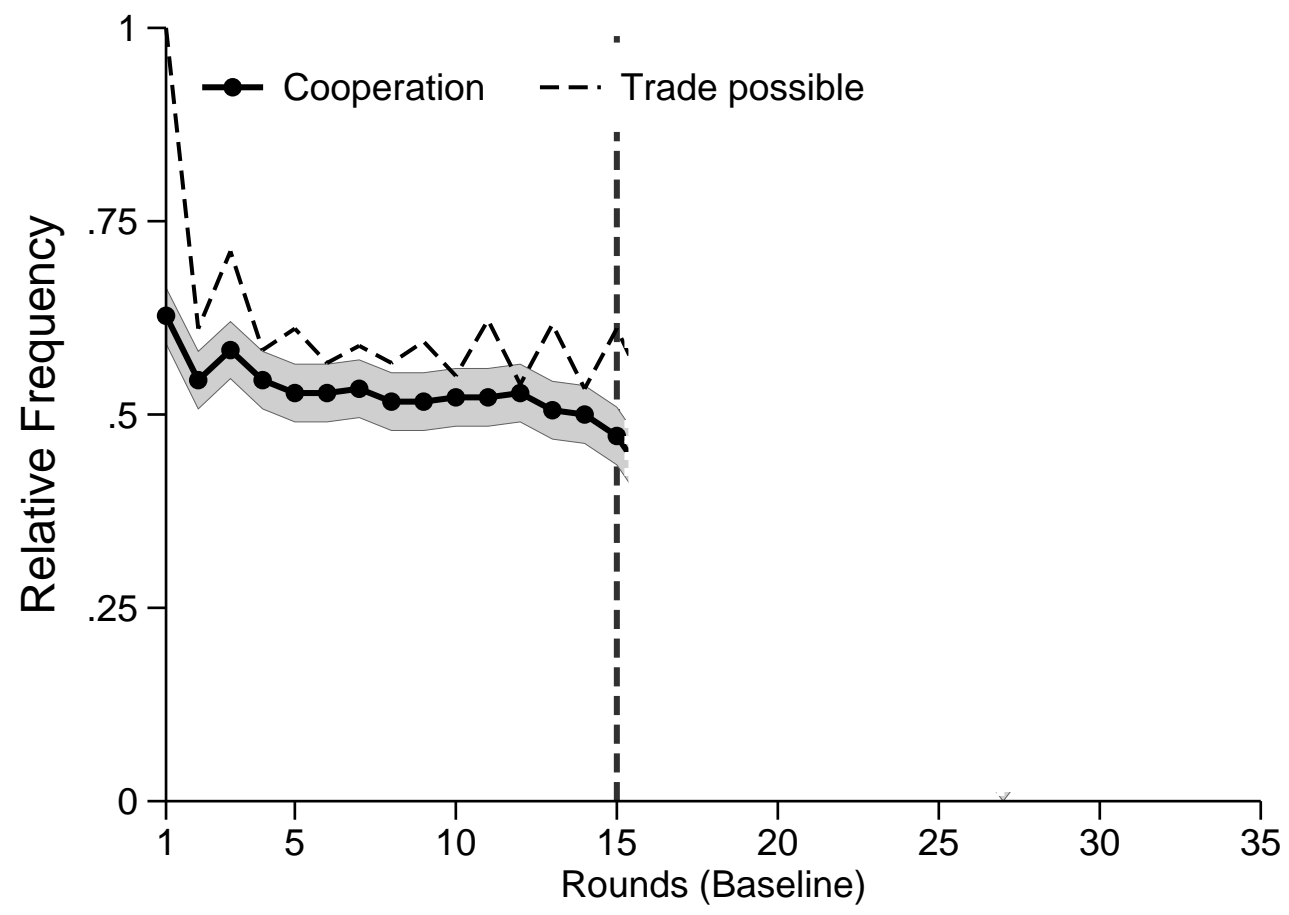
BELIEFS ABOUT FUTURE CIRCULATION/ACCPETABILITY MATTER!
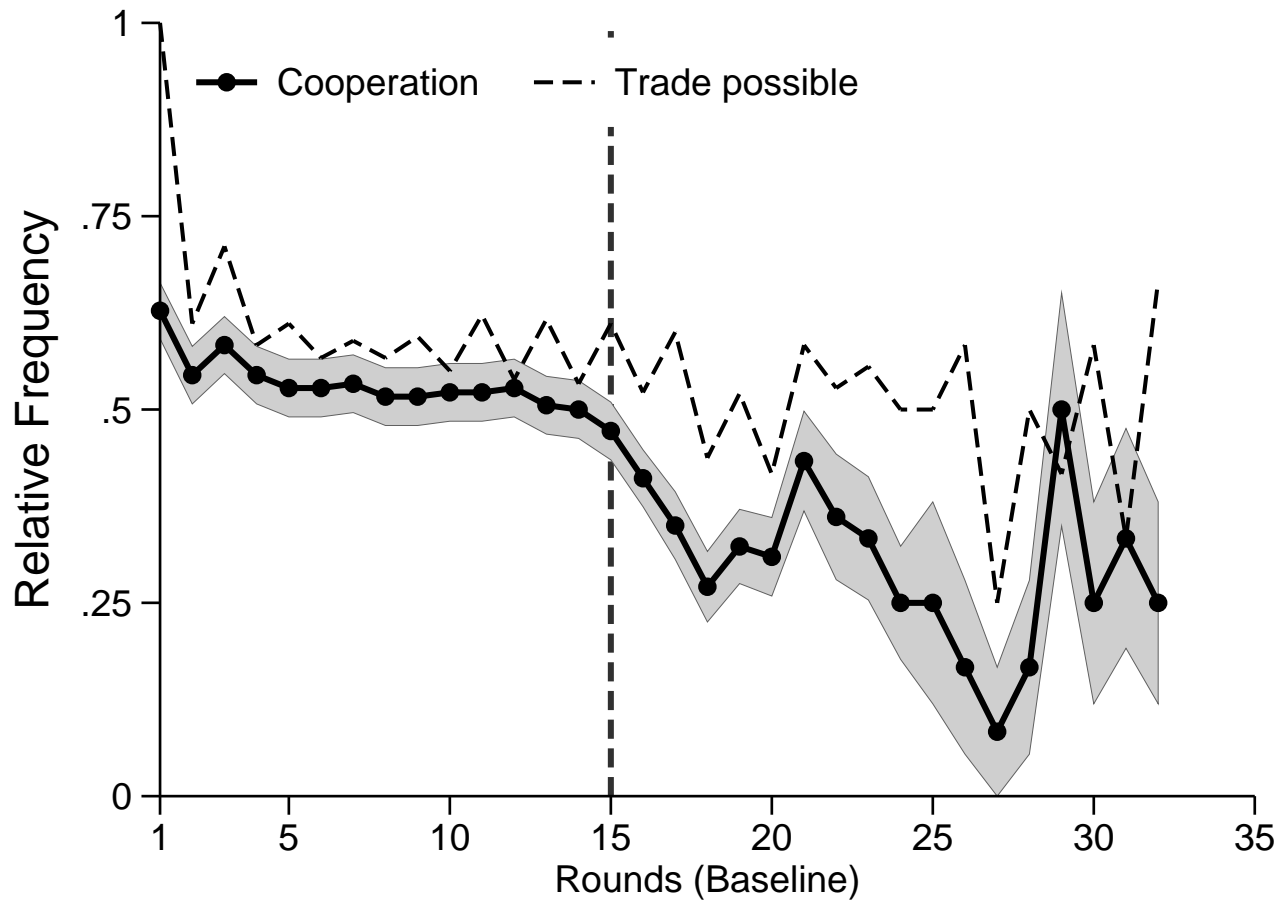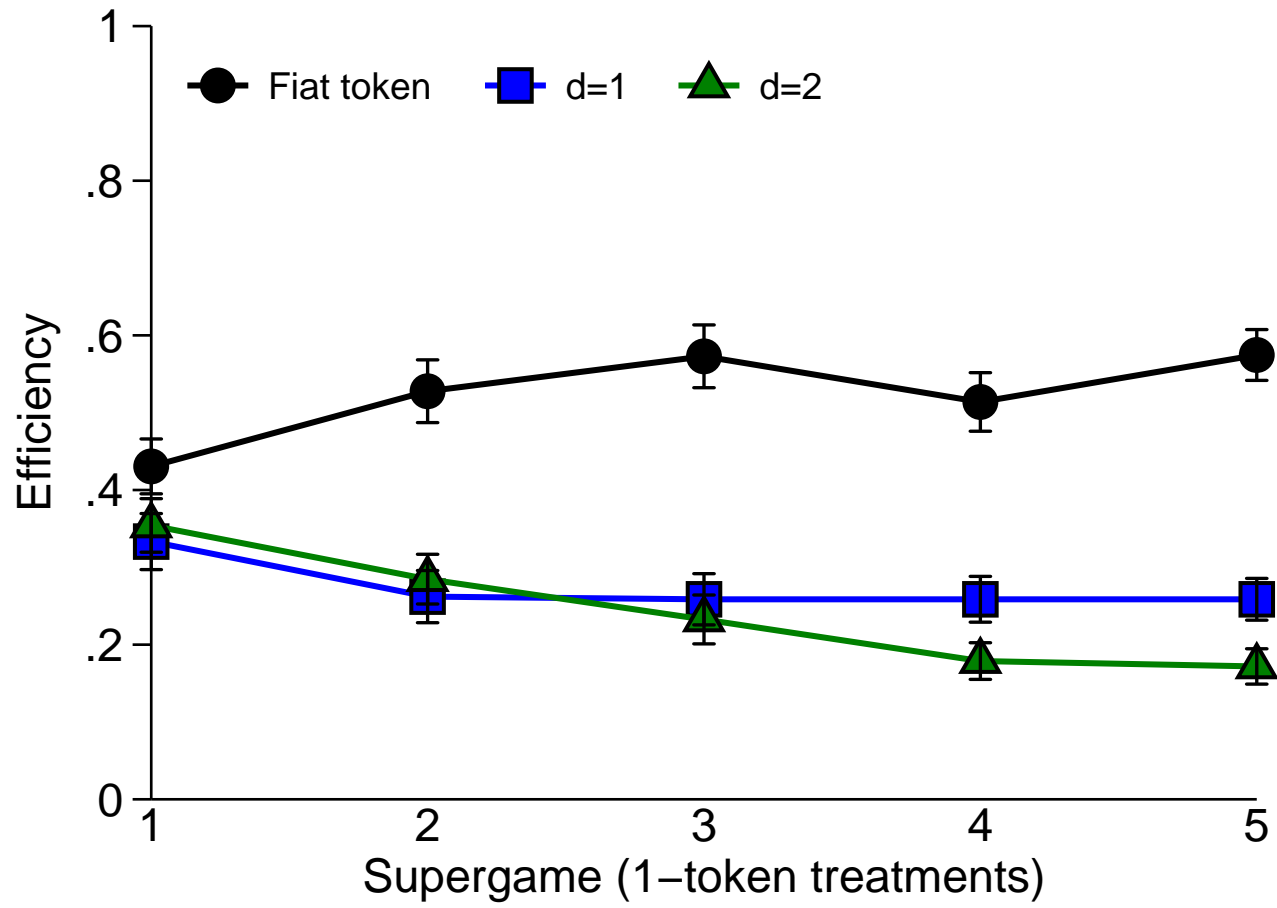
LET'S IMPROVE TOKENS:

HOLDING A TOKEN HAS A SMALL BENEFIT

1 PT. BENEFIT (IN MONETARY EQ'M TOKENS SHOULD GAIN VALUE)
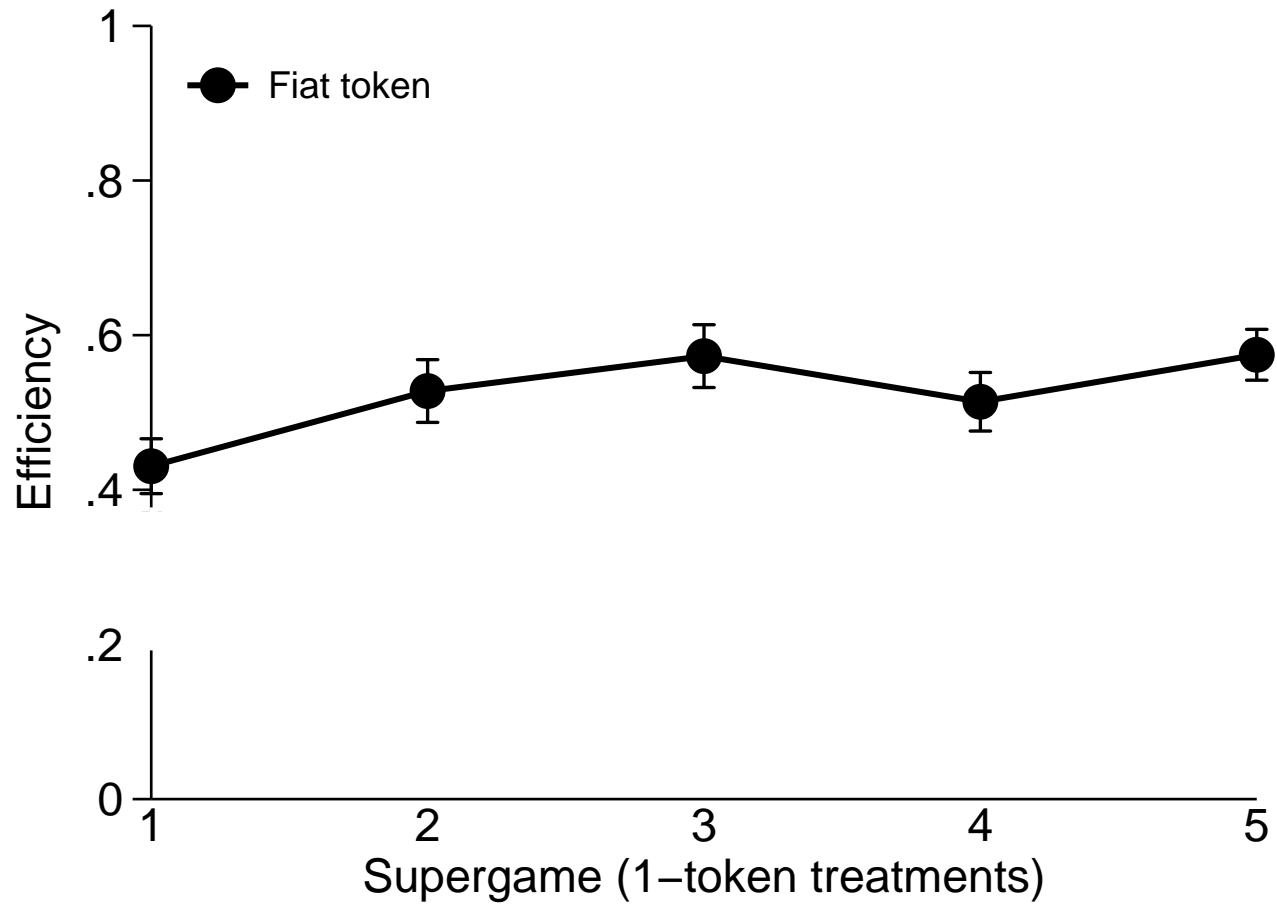
1 PT. BENEFIT (IN MONETARY EQ'M TOKENS SHOULD GAIN VALUE)
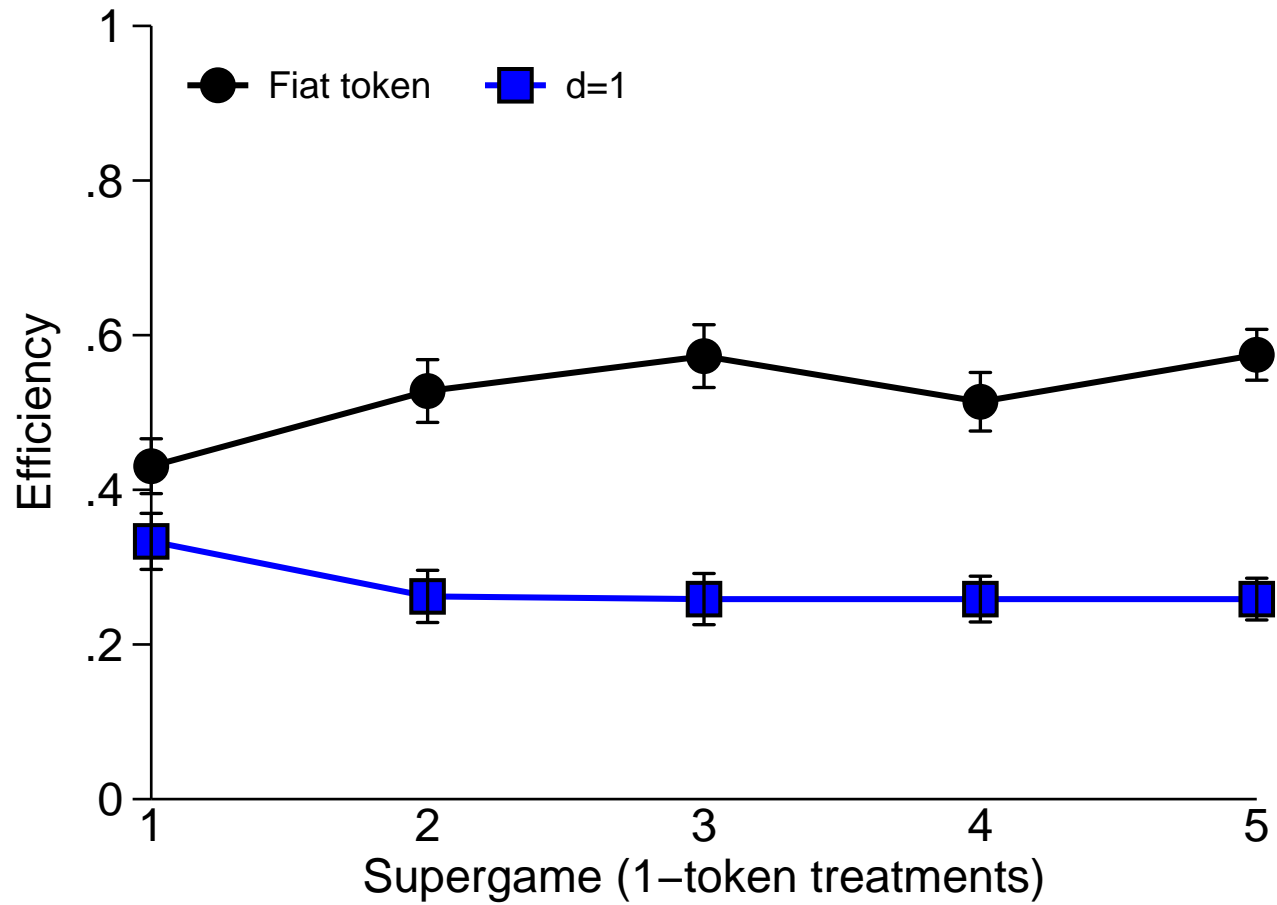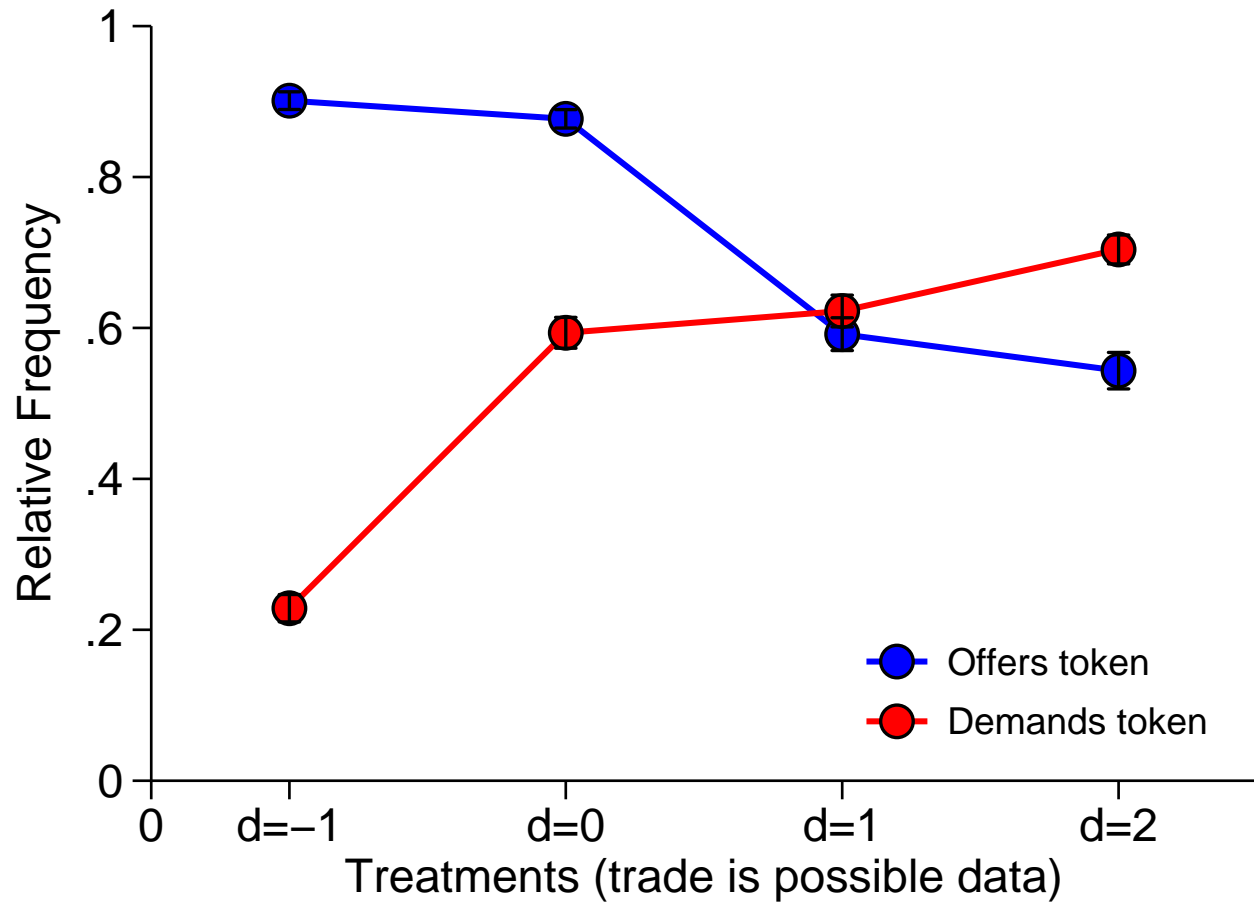
2 PT. BENEFIT

WHAT HAPPENED? HERE ARE BARREN TOKENS
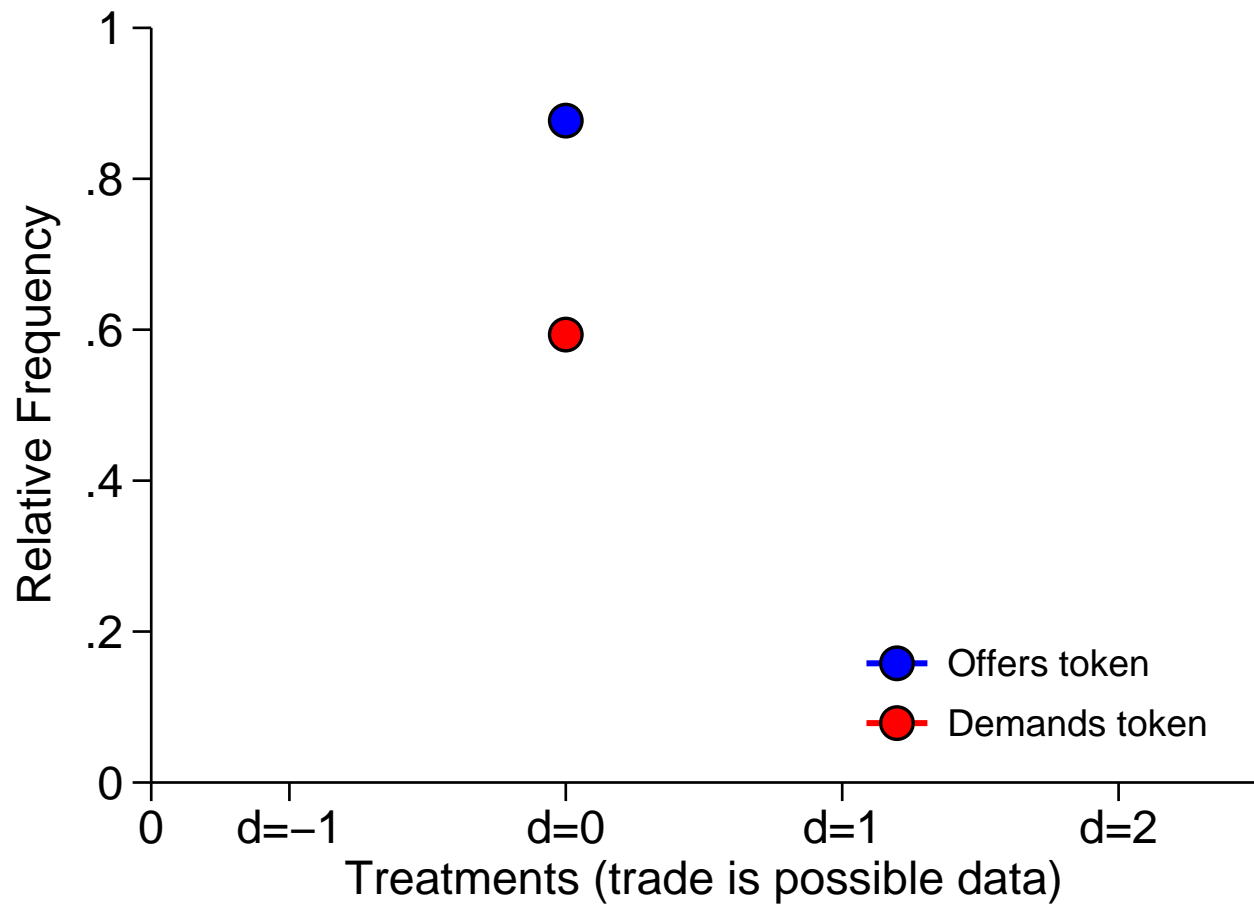
WITH A BENEFIT: DECLINE IN LIQUIDITY PROVISION
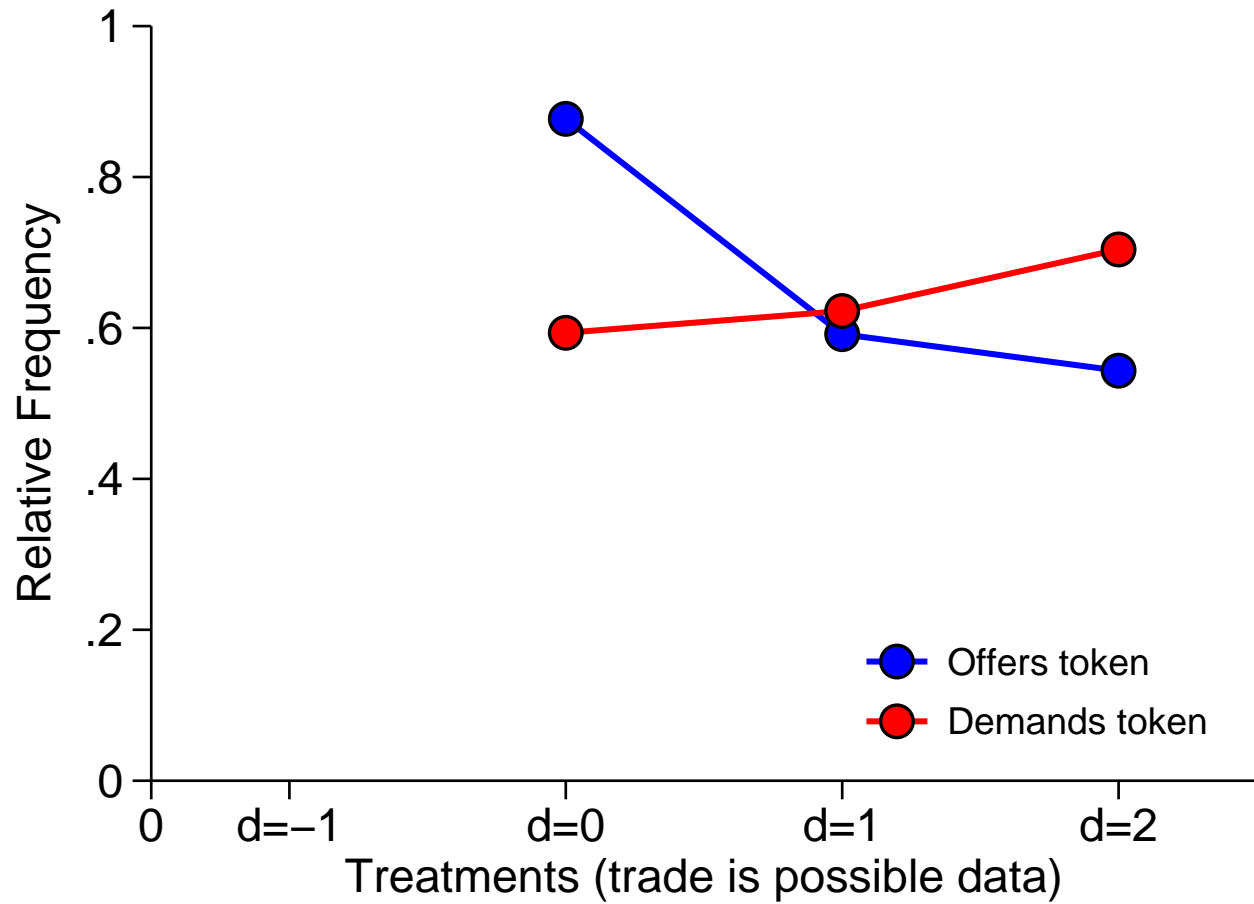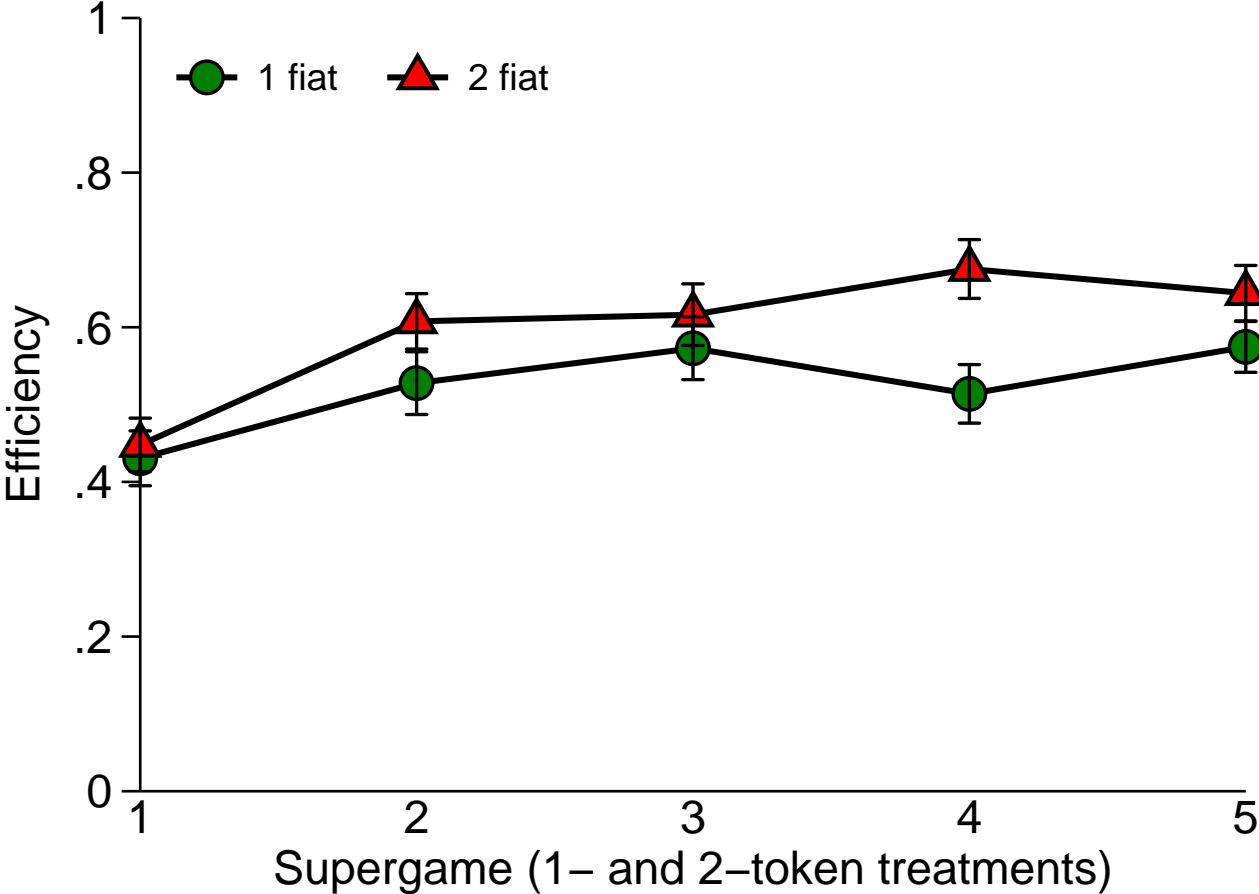
IMPOSING A 1 PT. PENALTY? NOT A SOLUTION
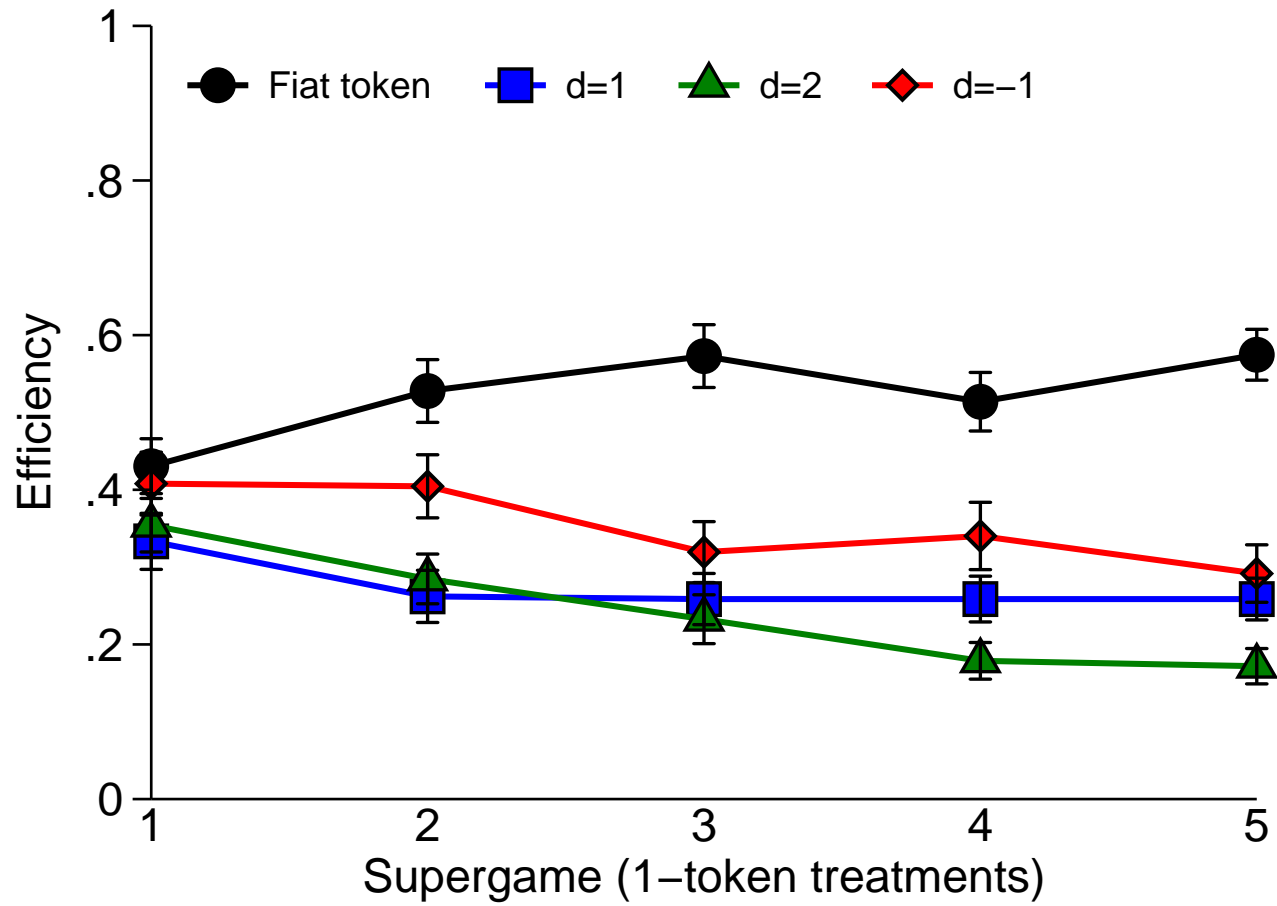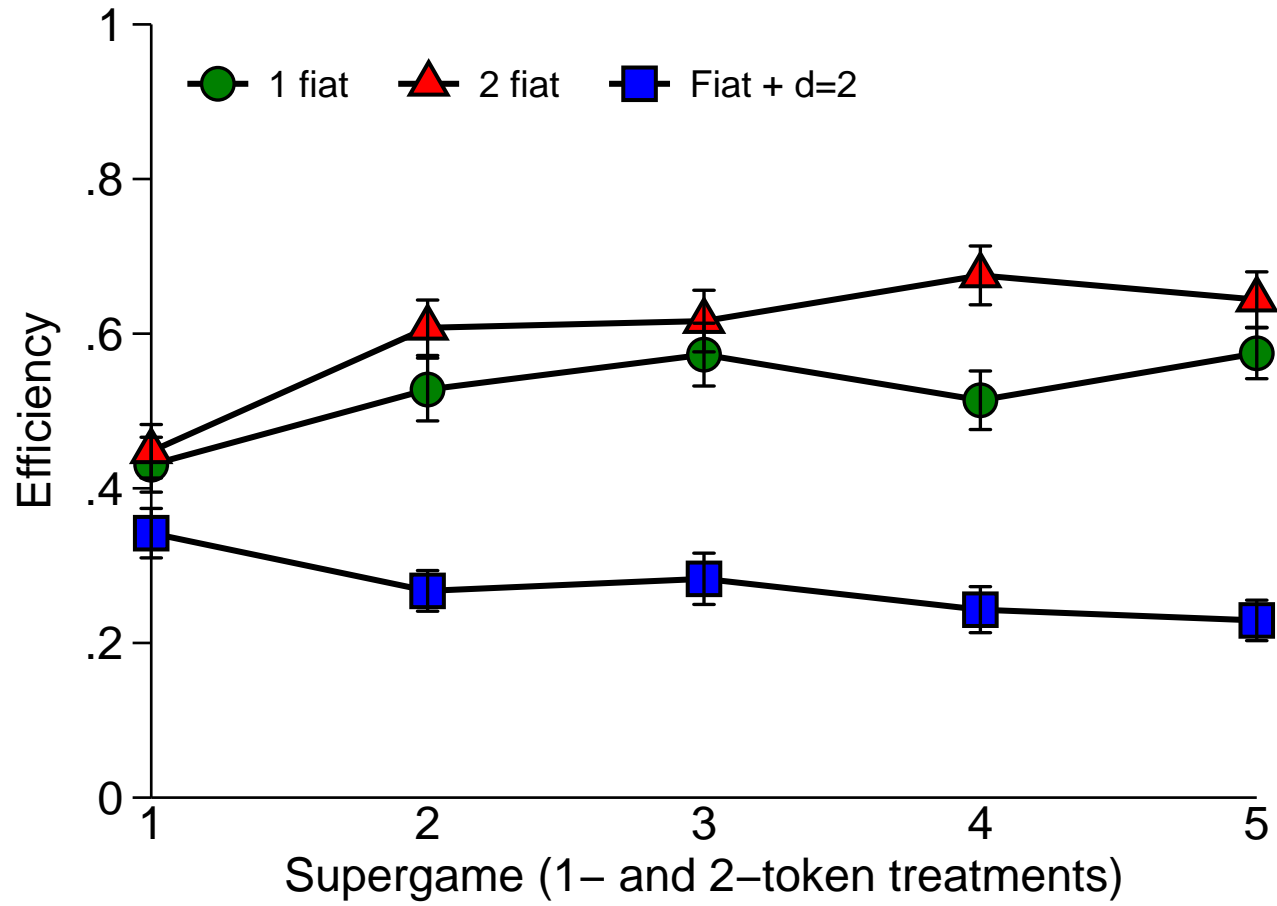
WITH PENALTIES, ACCEPTABILITY DECLINES

MY BAD: A CBDC WILL BE COMPLEMENTARY

INTRODUCE IT ALONGSIDE BARREN TOKENS

CONTROL: DOUBLE SUPPLY OF FIAT (LESS ILLIQUIDITY)

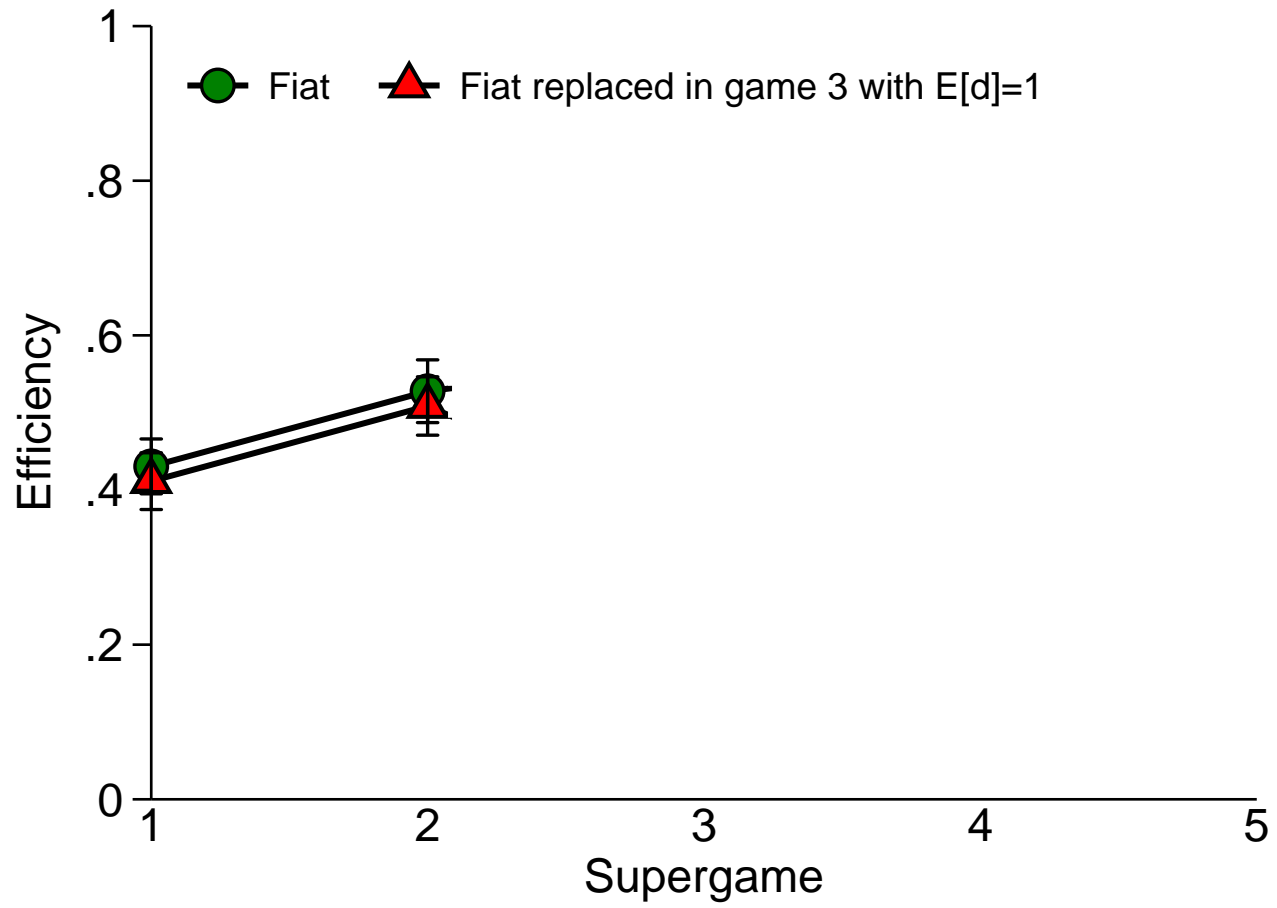# TREATMENT: FIAT + CBDC IN EQUAL SUPPLY
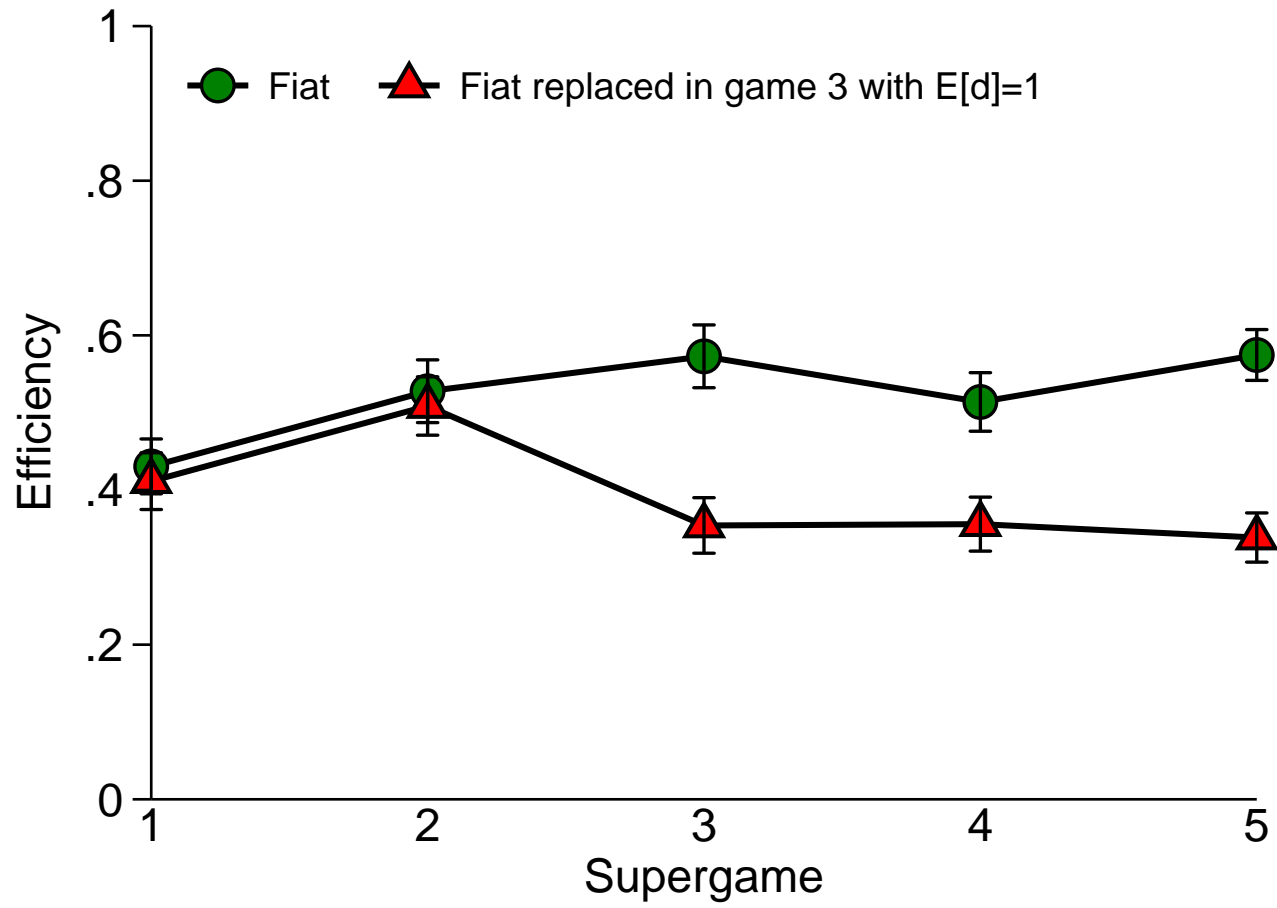
OK THEN: CBDC WILL SUBSTITUTE FOR FIAT

INTRODUCE IT AFTER LEARN TO USE FIAT

TREATMENT: CBDC REPLACES FIAT IN GAME 3

TREATMENT: CBDC REPLACES FIAT IN GAME 3

WHAT HAVE WE LEARNED?

LESSON 1

Money is a social convention, which emerges endogenously based on beliefs.

Self-enforcing: instrument traded now if anticipate large-scale circulation tomorrow.

Insight: anything that affects these beliefs may disturb system's performance.

LESSON 2

Short-sighted conduct less likely with "barren" instruments.

A barren token focuses participants on long-term gains from exchange.

Insight: hoarding incentives if premia; acceptability frictions if penalties.