E-KRONA, MONEY AND TRUST AMONG STRANGERS

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BROAD VIEW

Goal: present concepts relevant for currency innovation, get a discussion started

Technological innovation enables alternatives to traditional currency instruments

Starting point to assess implications: *understanding the role of money in a society*

I will discuss this by offering insights from complementary scientific methodologies:
- Theoretical: to formulate logical intuitions
- Empirical: to validate or refine theoretical intuitions

ROADMAP FOR THE NEXT 20 MINUTES

1. Why societies need money to function

2. Three theoretical sources of possible inefficiency

3. A peek at insights from laboratory data

Literature & references: a variety of authors (e-mail me for a list)

Why societies need money to function

THE USES OF MONEY IN A SOCIETY

- *Society* (economy): a group of people who benefit from trading with each other

- *Currency*: an (in)tangible object that widely circulates to enable payments

  "fiat"=no intrinsic value or explicit convertibility (a symbolic object)

Money is synonymous of currency & serves three functions:

- facilitates trade (means of payment)

- serves quantification purposes as a standard of value (unit of account)

- facilitates self-insurance (storing of value)

Take-away: currency value reflects the value of economic activities it enables

THE NATURE OF MONEY

Money is a social convention

Theory: the most valuable trades in a society are impersonal

- Impersonal interactions prevent reciprocity, the basic ingredient of trust

- Lack of trust prevents mutually beneficial trades (=economic cooperation)

- Monetizing trade enables cooperation among strangers, generating value

Take-away: a monetary trade convention resolves underlying trust problems

Three theoretical sources of possible inefficiency

#1—COORDINATION PROBLEMS: MONEY IS LIKE A LANGUAGE

The more people speak a language, the more valuable that language is to them

So, instrument coordination needed to maximize value of currency system

- But achieving coordination may be difficult when many instruments compete

- Instrument fragmentation can be a source of inefficiency (network effects)

- Coordination especially problematic when incentives are mis-aligned

Take-away: coordination problems loom large in establishing a currency system

COORDINATION FAILURES IN SELECTING A PAYMENT INSTRUMENT

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

	cash	electronic
cash	90, 90	0, 0
electronic	0, 0	180, 180

...but not here (redistribution of wealth)

	cash	electronic
cash	180, 90	0, 0
electronic	0, 0	90, 180

A coordination "device" (a public institution?) is valuable in case 2

#2—BUILDING/MAINTAINING PUBLIC CONFIDENCE IN A CURRENCY

A currency's value reflects the level of public confidence in it

Theory: object becomes a currency if no-one can personally gain from refusing it

The idea: I accept a symbolic object if I trust that others will do the same, so

- acceptability depends on the future value of the instrument

- the future value depends on the trades the instrument expected to support

- a circular argument hinging on beliefs (self-fulfilling acceptability)

CONFIDENCE IN A CURRENCY ≈ CONFIDENCE IN THE ISSUER

- *Historically*: confidence = quality of the coins issued

- *Nowadays*: confidence = quantity issued

The problem: issuer earns yield spread btwn assets acquired & liabilities issued

- Micro-economic opportunism: temptation to overissue currency instruments

- Macro-economic externality: currency value may become unstable or decline

- This will *eventually* reduce the issuer's payoff (an inter-temporal tradeoff)

Take-away: Confidence easier to build if issuer known to have a long-run horizon

#3—CURRENCY SYSTEMS ARE PUBLIC GOODS

A currency system is similar to clean air or national parks (non-excludable, non-rival)

Theory: private contribution to public goods is inefficient

- Inefficiency= excessive emission of currency instruments

- This damages confidence in (hence value & stability of) a currency

Take-away: public good aspect suggests role for public currency provision

A peek at insights from laboratory data

CURRENCY SYSTEMS IN THE LAB

No justification really needed here in Stockholm (Vernon Smith—Nobel Prize 2001)

But let me emphasize one particular advantage of this methodology:

- Can manipulate the lab setup to establish causality

Let's discuss three findings:

- Currency systems emerge spontaneously & promote trust among strangers

- Confidence in a currency reflects confidence in the issuer(s)

- A society's economic development reflects the strength of its currency system

#1—Currency systems emerge spontaneously & promote trust among strangers

LABORATORY SETUP

- (Macro)Economy= group with even participants (4 to 32), producers+consumers

- Horizon: participants expect many pairwise encounters (producer-consumer)

  – Strangers: roles alternate, counterpart unknown, hidden past conduct

  – Trade motive: consumer values production a lot more than producer

  – Optimum: producers always make a gift (= 100% cooperation = max welfare)

- The problem: producer must trust that strangers will reciprocate her current gift

Reflects setup in "frictional" macro models (see Nobel prize 2010)

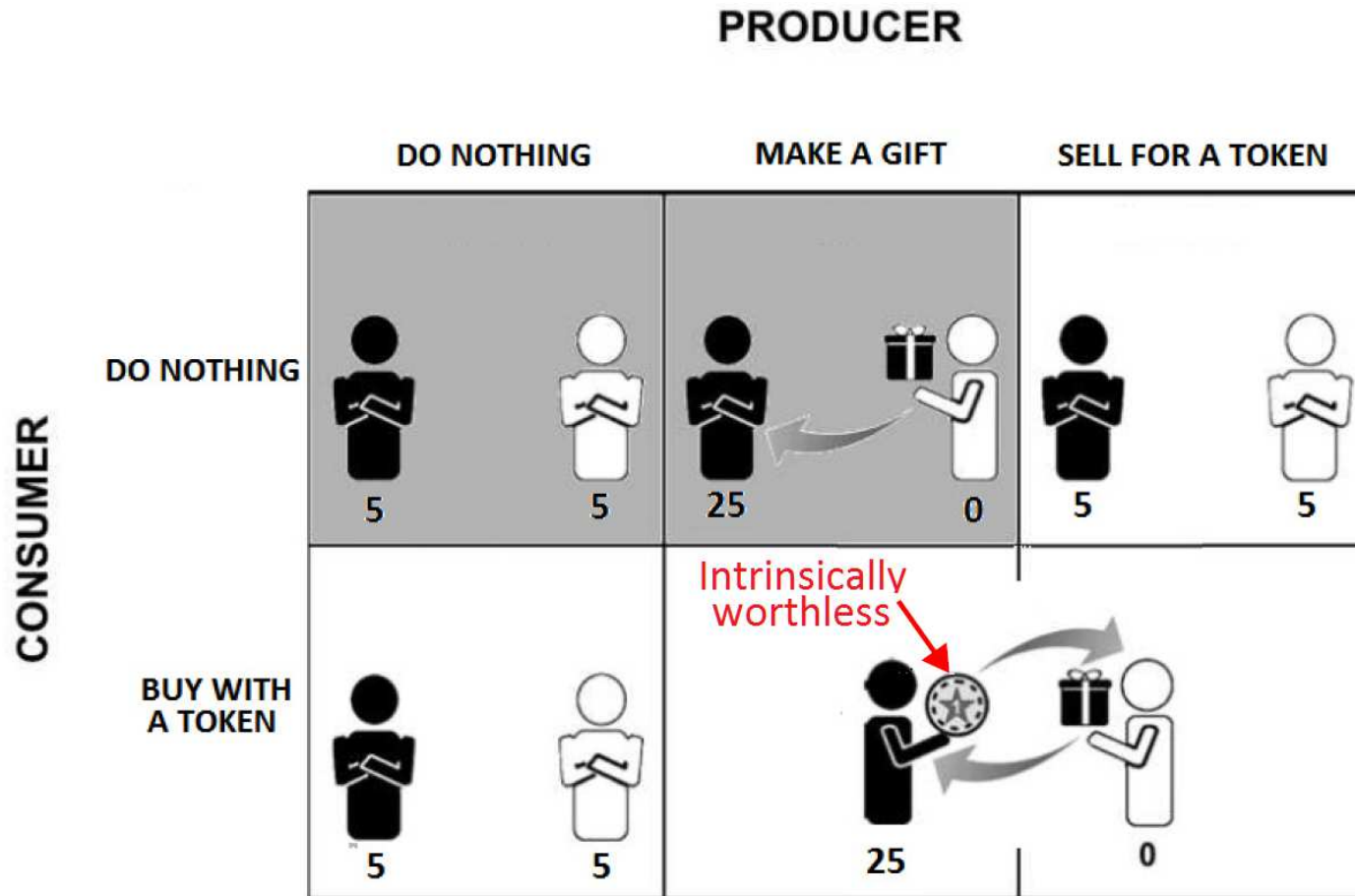# THE PRODUCER'S ALTERNATIVES WHEN MEETING A STRANGER
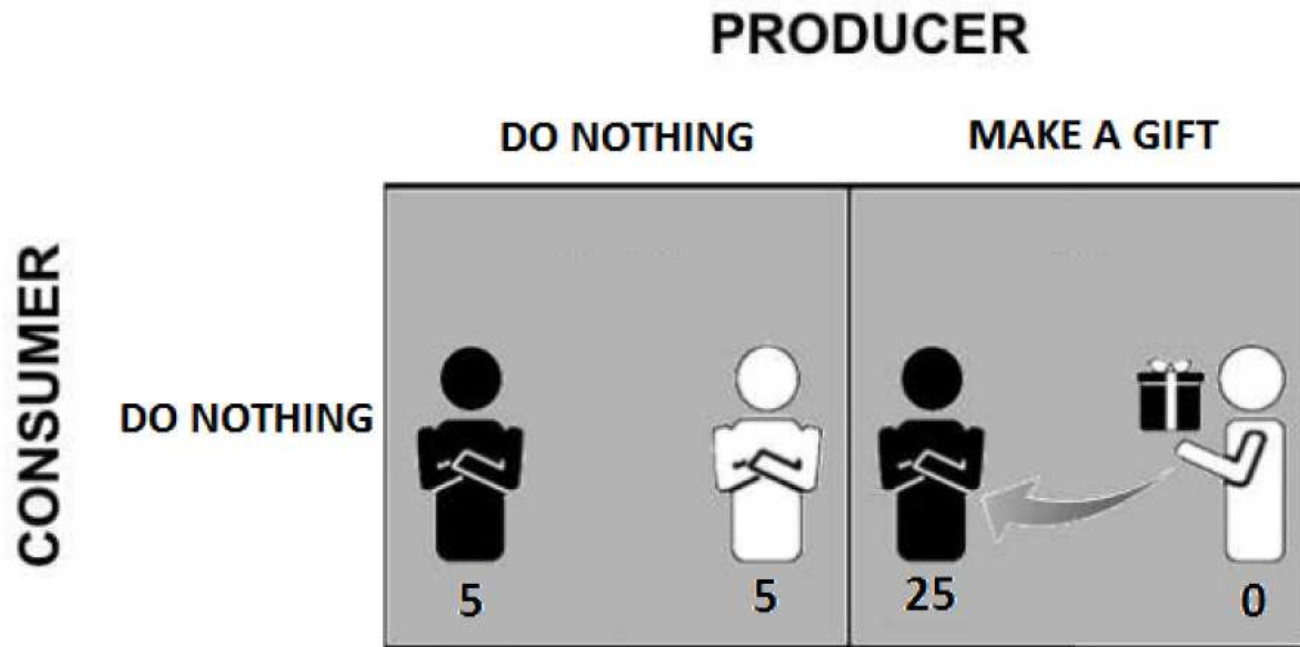
Points cumulate, are exchanged for $$ at session end (cash payments)

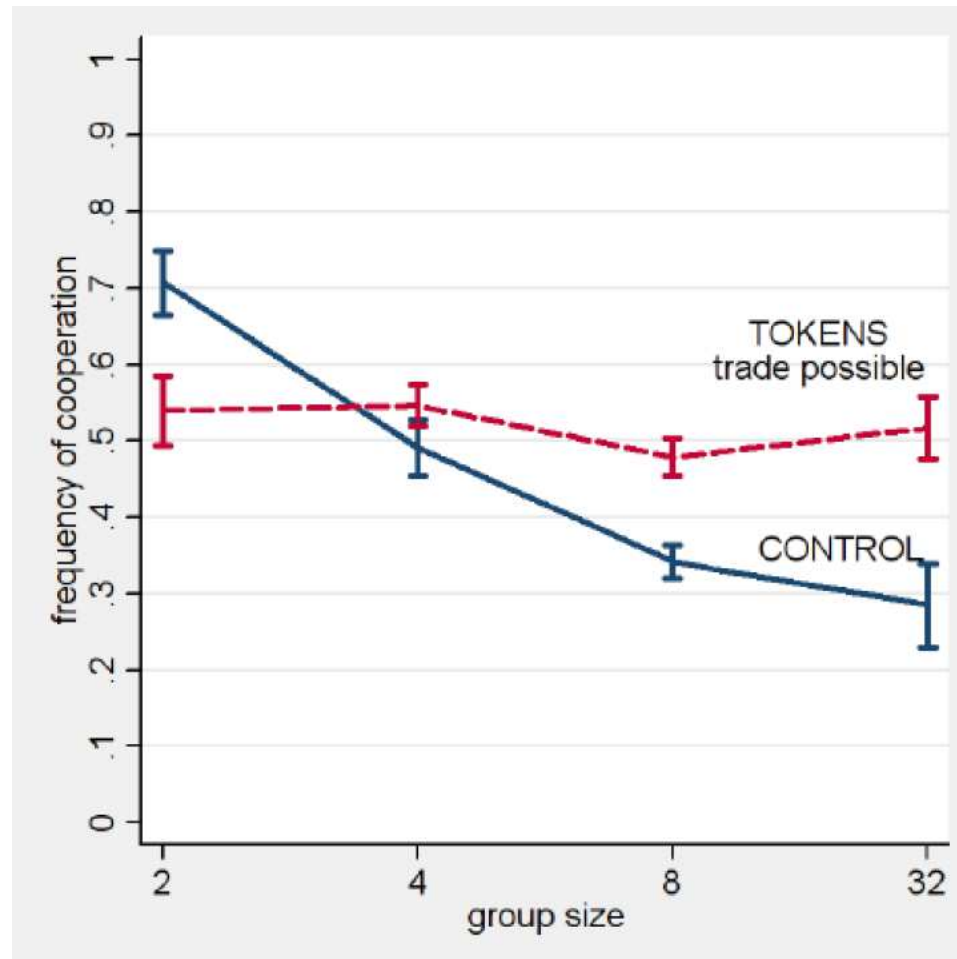# EFFICIENCY DECLINES AS GROUPS GET LARGER
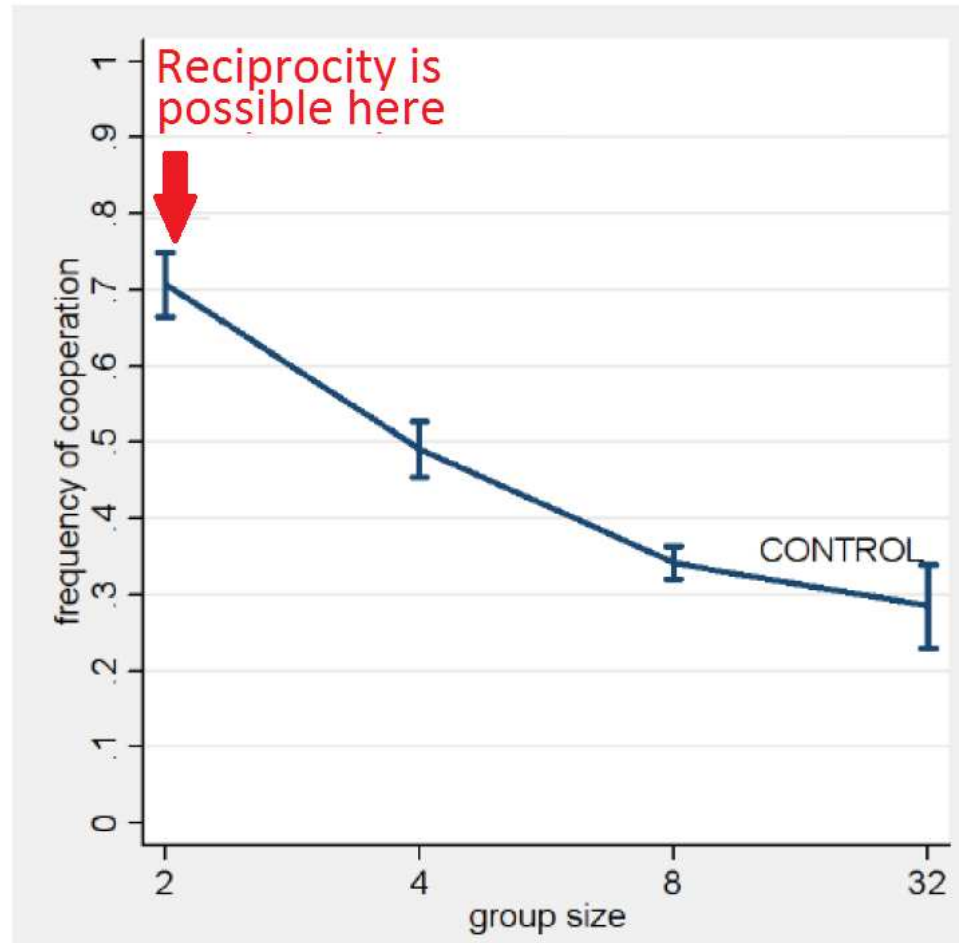
Take-away: no trust in strangers ⇒ no intertemporal trade ⇒ macro inefficiency

SO WE ADDED TOKENS (=WORTHLESS DIGITAL OBJECTS)

Fixed supply, no reference to outside currencies, no redemption, *quid-pro-quo*

NO MORE EFFICIENCY DECLINE AS GROUPS GET LARGER

Take-away: symbolic objects became money, helped strangers trust each other

2—Confidence in a currency reflects confidence in the issuer(s)

# SO FAR FULL CONFIDENCE IN THE ISSUER (FIXED SUPPLY)

What would happen if private supply? Contrast two conditions

- Control: stable, exogenous supply of tokens

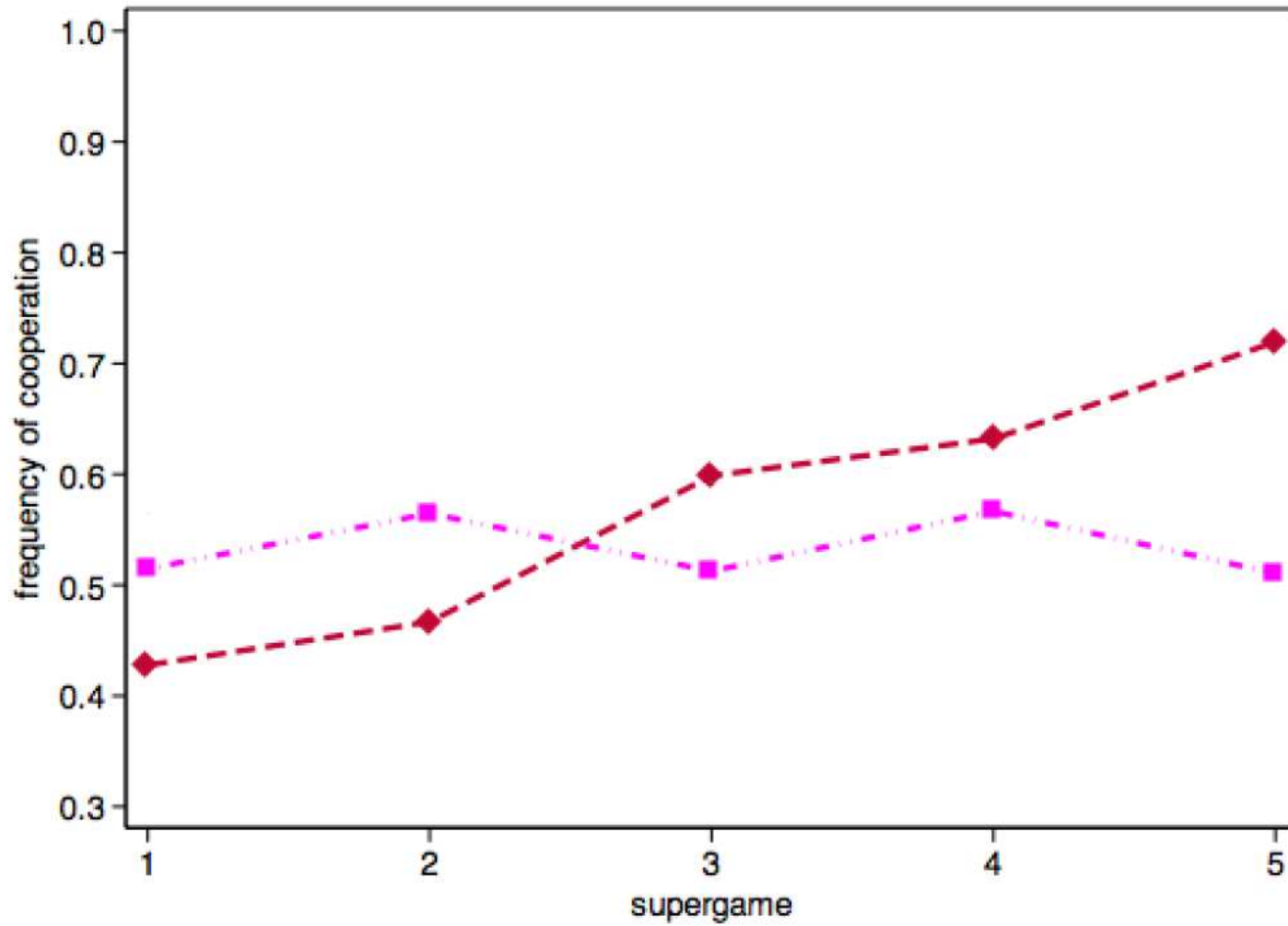- Treatment: consumers can issue tokens, adding to existing supply

Theoretically, any supply increase is socially suboptimal should not occur

Track (if and) how a currency system develops over 5 consecutive "games"

FIXED SUPPLY: CIRCULATION & EFFICIENCY GROW
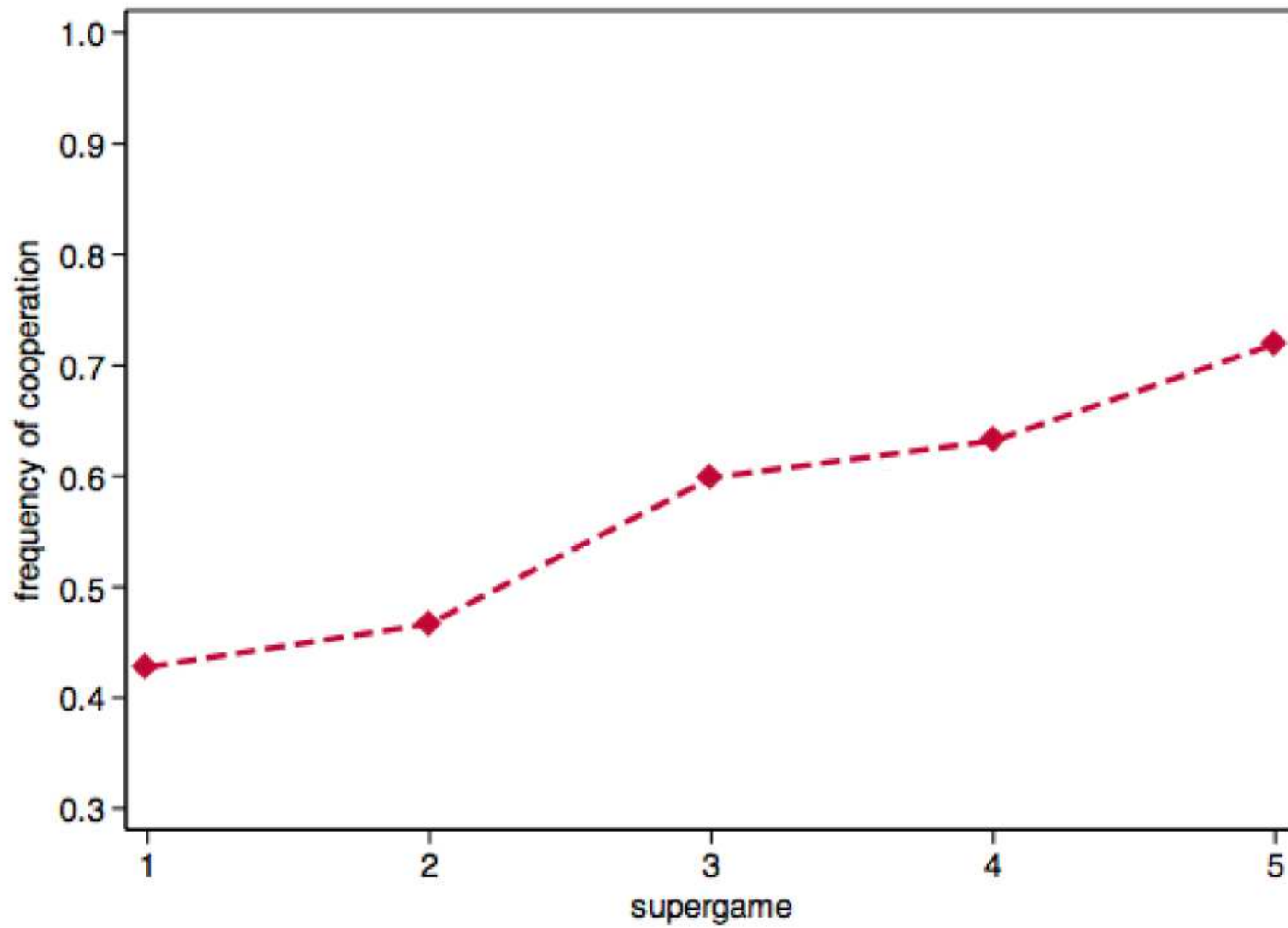
PRIVATE SUPPLY: CIRCULATION & EFFICIENCY LANGUISH

#3—A society's economic development reflects the strength of its currency system

SET PEOPLE FREE TO IMPROVE THEIR "ECOSYSTEM"

- Stay in small group: easy to build trust, but little to gain (autarky)

- Form a large group: hard to build trust, but 50% more to gain (trade)

Again, separately study this choice without and with tokens

Theoretically in each case optimal to form large group, easy to reap full benefits

NO TOKENS, NO ECONOMIC DEVELOPMENT
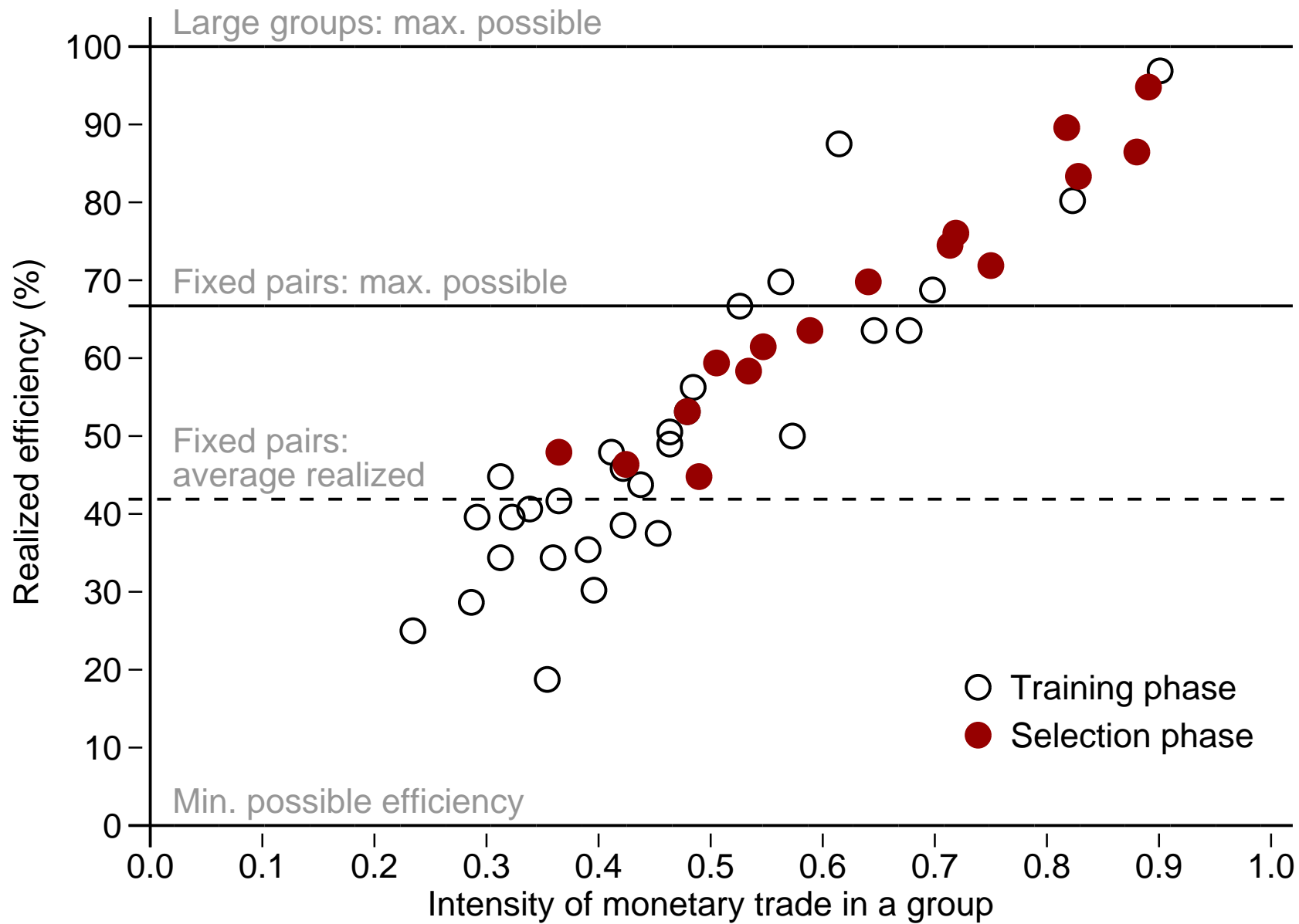
Realized efficiency index (max=100)

	Control	N
Partnerships	57	13
Large groups	45	3

WITH TOKENS, WE SEE ECONOMIC DEVELOPMENT

Realized efficiency index (max=100)

	Control	N	Tokens	N
Partnerships	57	13	55	6
Large groups	45	3	67	10

. . . but not in societies that failed to develop a strong monetary convention

What have we learned?

LESSON 1

Money builds trust, helps strangers collaborate to achieve common prosperity

LESSON 2

Money is a social convention, exposed to coordination and confidence problems

LESSON 3

A currency system is a public good, so inefficient private contributions possible