Online Appendix to:
"Adoption of a New Payment Method: Experimental Evidence"

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A Best Response Functions in the Payment Adoption Stage

A.1 Buyer's Portfolio Decision

In this subsection, we prove Proposition 1 and analyze the buyer's portfolio decision, m^b, conditional on the seller's adoption decision, m^s. We will carry out the analysis in two cases: (1) $m^b \geq m^s$, and (2) $m^b \leq m^s$.

If $m^b \geq m^s$, then each buyer makes m^s purchases using the new payment method and $1 - m^b$ purchases using the existing payment method. Buyers are not able to transact with a fraction $m^b - m^s$ of sellers because of payment mismatches (buyers want to use payment method 2 but sellers only accept payment method 1). The buyer's expected payoff in this case is:

$$\pi^b = \underbrace{m^s(u - \tau_2^b)}_{\text{transactions using payment method 2}} + \underbrace{(1 - m^b)(u - \tau_1^b)}_{\text{transactions using payment method 1}} .$$

Note that

$$d\pi^b/dm^b = -(u - \tau_1^b) < 0.$$

It follows that for this case, the optimal choice of each buyer is to reduce m^b to m^s so as to minimize the probability of a payment mismatch or no-trade outcome.

If $m^b \leq m^s$, then each buyer makes m^b transactions using the new payment method and $1 - m^b$ transactions using payment method 1 (among which $m^s - m^b$ are with sellers who also accept the new payment method). The buyer's expected payoff is now given by:

$$\pi^b = \underbrace{m^b(u - \tau_2^b)}_{\text{transactions using payment method 2}} + \underbrace{(1 - m^b)(u - \tau_1^b)}_{\text{transactions using payment method 1}} .$$

In this case we have that

$$d\pi^b/dm^b = -\tau_2^b + \tau_1^b > 0.$$

Thus, if $m^b \leq m^s$, then buyers should increase their payment 2 balances to m^s so as to minimize transaction costs.

From the analysis above it follows that buyers' optimal portfolio decision is to mimic the sellers' acceptance decision:

$$m^b(m^s) = m^s.$$

A.2 Seller's Payment 2 Acceptance Decision

In this subsection we prove Proposition 2 and derive the seller's acceptance decision conditional on the buyer's portfolio decision, m^b. We will carry out our analysis under two parameter settings: (1) $F \le \tau_1^s - \tau_2^s$, and (2) $F > \tau_1^s - \tau_2^s$. For each parameter setting, similar to the discussion of the buyer's choice, we analyze the seller's decision in two cases: $m^b \ge m^s$ and $m^b \le m^s$.

Parameter Setting (1): $F \le \tau_1^s - \tau_2^s$. If $m^b \ge m^s$, then each seller who accepts the new payment method engages in a unit measure of payment-method-2 transactions (remember that buyers use the new payment method whenever the seller accepts it), and has a payoff of

$$\pi_2^s = 1 - \tau_2^s - F.$$

Sellers who only accept payment method 1 engage in an average of $(1-m^b)/(1-m^s) \le 1$ transactions using payment method 1 (the total payment method 1 balance in the economy is $1-m^b$ and this is divided among the $1-m^s$ sellers who only accept payment 1). Sellers who accept only payment 1 thus have a payoff of

$$\pi^s = \frac{1-m^b}{1-m^s}(1-\tau_1^s).$$

In this case,

$$\begin{aligned}(\pi_2^s - \pi_1^s)|_{m^b \ge m^s} &= 1 - \tau_2^s - F - \frac{1-m^b}{1-m^s}(1-\tau_1^s) \\ &= (\tau_1^s - \tau_2^s - F) + \frac{(1-\tau_1^s)(m^b - m^s)}{1-m^s}.\end{aligned}$$

As long as $m^b > m^s$, we have $\pi_2^s > \pi_1^s$, i.e., each seller who accepts the new payment method is able to trade for the new payment method in all meetings, which makes it profitable to pay the fixed cost, F, to accept the new payment method. As a result, π^s will increase. In equilibrium, it must be the case that $m^b \le m^s$.

If $m^b \le m^s$, the payment method 2 balance in the economy can support m^b payment 2 transactions, which are divided among m^s sellers who accept payment 2. Each seller who accepts payment 2 can trade in all meetings, among which m^b/m^s will be payment 2 transactions, and the remaining $1 - m^b/m^s$ will be payment 1 transactions. The expected payoff of a seller who accepts the new payment method is therefore:

$$\begin{aligned}\pi_2^s &= \underbrace{\frac{m^b}{m^s}(1-\tau_2^s)}_{\text{transactions using payment method 2}} + \underbrace{\left(1 - \frac{m^b}{m^s}\right)(1-\tau_1^s)}_{\text{transactions using payment method 1}} - F \\ &= (1-\tau_1^s) + \frac{m^b}{m^s}(\tau_1^s - \tau_2^s) - F.\end{aligned}$$

Sellers who accept only payment 1 engage in payment 1 transactions in all meetings and have a payoff of

$$\pi_1^s = 1 - \tau_1^s.$$

In this case,

$$(\pi_2^s - \pi_1^s)|_{m^b \leq m^s} = \frac{m^b}{m^s}(\tau_1^s - \tau_2^s) - F.$$

If $m^b \geq F/(\tau_1^s - \tau_2^s)$, then it is a dominant strategy for sellers to accept the new payment method: each seller makes more than $F/(\tau_1^s - \tau_2^s)$ sales in payment 2 to warrant the fixed investment to accept payment 2. If $m^b \leq F/(\tau_1^s - \tau_2^s)$, the number of transactions using payment method 2 is not large enough to recover the fixed acceptance cost for all sellers. As a result, sellers play a mixed strategy: $m^s = m^b(\tau_1^s - \tau_2^s)/F$ fraction of sellers accept both payment methods, and the rest accept only payment method 1. All sellers earn the same expected payoff ($\pi_1^s = \pi_2^s$).

To summarize, if $F \leq \tau_1^s - \tau_2^s$, then given the buyer's strategy m^b, the seller's strategy is such that

$$m^s(m^b) = \begin{cases} \frac{m^b(\tau_1^s - \tau_2^s)}{F} & \text{if } m^b \leq \frac{F}{\tau_1^s - \tau_2^s}, \\ 1 & \text{if } m^b \geq \frac{F}{\tau_1^s - \tau_2^s}. \end{cases}$$

Note that if $F = \tau_1^s - \tau_2^s$, then $m^s(m^b) = m^b$.

Parameter Setting (2): $F > \tau_1^s - \tau_2^s$. Suppose that $m^b < m^s$. Then, sellers who do not accept the new payment method earn a higher payoff (i.e., $\pi_2^s - \pi_1^s < 0$). As a result, m^s will decrease. In equilibrium, it must be the case that $m^b \geq m^s$.

If $m^b \geq m^s$, it is a dominant strategy for sellers not to accept the new payment method if $m^b \leq \hat{m}_b \equiv 1 - [(1 - \tau_2^s) - F]/(1 - \tau_1^s)$. If $m^b \geq \hat{m}_b$, then sellers play a mixed strategy, choosing to accept with probability $m^s(m^b) = 1 - (1 - m^b)(1 - \tau_1^s)/[(1 - \tau_2^s) - F]$, which solves $(\pi_2^s - \pi_1^s)|_{m^b \geq m^s} = 0$.

To summarize, under the parameter setting $F > \tau_1^s - \tau_2^s$, given the buyer's strategy m^b, the seller's strategy is such that

$$m^s(m^b) = \begin{cases} 0 & \text{if } m^b \leq 1 - \frac{(1-\tau_2^s) - F}{1 - \tau_1^s}, \\ 1 - \frac{(1-m^b)(1-\tau_1^s)}{(1-\tau_2^s) - F} & \text{if } m^b \geq 1 - \frac{(1-\tau_2^s) - F}{1 - \tau_1^s}. \end{cases}$$

B Experimental Instructions, T-2.8 Treatment (other instructions similar)

Welcome to this experiment in economic-decision making. Please read these instructions carefully as they explain how you earn money from the decisions that you make. You are guaranteed $7 for showing up and completing the study. Additional earnings depend on your decisions and on the decisions of other participants as explained below. You will be earning experimental money (EM). At the end of the experiment, you will be paid in dollars at the exchange rate of 1 EM = $0.15.

There are 14 participants in today's experiment: 7 will be randomly assigned the role of buyers and 7 the role of sellers. You will learn your role at the start of the experiment, and remain in the *same* role for the duration of the experiment. Buyers and sellers will interact in 20 "markets" to trade goods for payment. There are two payment methods, payment 1 and payment 2.

Each market consists of two stages. The first is the payment choice stage. Each buyer is endowed with 7 EM and decides how to allocate it between the two payment methods. Each seller is endowed with 7 units of goods. Sellers have to accept payment 1, but can decide whether or not to accept payment 2. Sellers who decide to accept payment 2 have to pay a one-time fee of 2.8 EM. No participant observes any seller's choice at this stage.

The second stage is the trading stage, which consists of a sequence of 7 rounds. In these 7 rounds, you meet with each of the 7 participants who are in the opposite role to yourself sequentially and in a random order. In each meeting you try to trade one unit of good for one unit of payment. The buyer decides which payment to use and the trade is successful if and only if the seller accepts the payment offered by the buyer. For each successful sale or purchase, you earn 1 EM less some transaction costs. The transaction cost to both sides is 0.5 EM if payment 1 is used, and 0.1 EM if payment 2 is used. If the buyer offers payment 1 (which is always accepted by sellers), then trade is successful and both the buyer and the seller earn a *net* payoff of 1-0.5=0.5 EM. If the buyer offers payment 2 and the seller has decided to accept payment 2 in the first stage, then trade is again successful and both earn a *net* payoff of 1-0.1=0.9 EM. If the buyer has only payment 2 and the seller has decided not to accept it, then no trade can take place and both earn 0 EM. At the end of the market, unspent EMs or unsold goods have no redemption value and do not entitle you to extra earnings.

Task summary

<table>
<tr><td rowspan="2">Market 1</td><td>Stage 1: Payment choice
Buyers allocate 7 EM between the two payments
Sellers decide whether to accept payment 2 at a one-time fee of 2.8 EM</td></tr>
<tr><td>Stage 2: Trading (7 rounds)
Each buyer meets each of the 7 sellers in a random order
Trade with payment 1 ➔ net payoff of 0.5 EM
Trade with payament 2 ➔ net payoff of 0.9 EM
No trade ➔ net payoff of 0 EM</td></tr>
<tr><td rowspan="2">Market 2</td><td>Stage 1: Payment choice</td></tr>
<tr><td>Stage 2: Trading (7 rounds)</td></tr>
<tr><td>…</td><td>…</td></tr>
<tr><td rowspan="2">Market 20</td><td>Stage 1: Payment choice</td></tr>
<tr><td>Stage 2: Trading (7 rounds)</td></tr>
</table>

More Inforamtion for Sellers

As a seller, your earnings in a market (in EM) is calculated as

Option I	Accept payment 2	Number of payment 1 transactions x 0.5 + **Number of payment 2 transactions x 0.9 – 2.8**
Option II	Not accept payment 2	Number of payment 1 transactions x 0.5

The benefit to sellers of accepting payment 2 is to increase the likelihood that you sell goods to buyers (remember no trade can take place if the buyer has only payment 2 and you do not accept it), and to reduce transaction costs and therefore increase net earnings by 0.4 EM each time a buyer pays in payment 2. The cost to sellers of accepting payment 2 is that you have to pay a one-time fee of 2.8 EM at the beginning of the market even if no buyers offer to pay you with payment 2 in that market.

Which option leads to higher earnings depends on all other 13 subjects' decisions. Table 1 on page 7 lists the average market earnings for the seller from the two options (accept / reject payment 2) in cases where all buyers choose to allocate between 0~7 EM to payment 2, and where 0~6 of the other 6 sellers choose to accept payment 2. As you can see, either option can give higher earnings depending on other participants' decisions. During the experiment, please keep Table 1 at hand for reference. In addition, you can use a "what if" calculator on the computer screen to compute the average earnings in situations where buyers make different payment allocations.

Your earnings from accepting payment 2 tend to increase if more buyers allocate more money to payment 2, and if fewer sellers accept payment 2. The opposite is true if you reject payment 2.

More Information for Buyers

As a buyer, your earnings in a market are calculated as

Number of payment 1 transactions x 0.5 + Number of payment 2 transactions x 0.9

As a buyer, the benefit of allocating more money to payment 2 is that you save 0.4 EM each time you use payment 2 instead of payment 1. The cost is the risk that you may not be able to trade if the seller does not accept payment 2 and you run out of payment 1 (which is always accepted). Your market earnings depend on your own payment allocation and the 7 sellers' decisions on acceptance of payment 2. Table 2 on page 7 lists the buyer's market earnings if the buyer allocates 0~7 EM to payment 2 (and the rest to payment 1) and if 0~7 sellers accept payment 2. You should allocate more money to payment 2 if you expect more sellers to accept it. Table 2 will also be on your computer screen when you make payment decisions.

Forecast

At the start of each market before making payment decisions, you are asked to forecast other participants' choices for that market. Buyers forecast how many of the 7 sellers will choose to accept payment 2. Sellers forecast (1) the average amount of EM that all 7 buyers will allocate to payment 2, and (2) how many of the other 6 sellers will accept payment 2. You earn 0.5 EM per correct forecast in addition to your earnings from buying/selling goods.

Earnings

At the end of the experiment, you will be paid your earnings in cash and in private. Your earnings in dollars will be: Total earning (trading + forecasting) in EM x 0.15 + 7 (show-up fee).

Computer Interface

You will interact anonymously with other participants using the computer workstations. You will see three types of screens (Figures 1-6 show sample screens).

Payment choice screen, Figures 1-2. This is where you make payment choices depending on whether you are a buyer (Figure 1) or a seller (Figure 2). Each screen has 4 parts. The upper portion summarizes information about previous markets. To the left of the blank column are your own activities, including your payment choice, the number of transactions using each of the two payment methods, the number of no-trade meetings, market earning from trading, and the number of correct forecasts that you made. To the right of the blank column, there is an aggregate market-level statistic, the number of sellers who accepted payment 2.

The middle section provides information about your average potential earnings from trading in each market. The buyer screen (Figure 1) shows Table 2. The seller screen (Figure 2) has a "what if" calculator. A seller can type in the number of buyers choosing to allocate 0~7 EM to payment 2 and the number of other 6 sellers accepting payment 2 (the default value is 0 in all fields; the first 8 fields must add up to 7; enter an integer 0~6 in the last field), press the "Calculate" button to create a record showing the average market earnings from accepting payment 2 and not accepting it, as well as the average buyers' allocation to payment 2 in that scenario. For example, if you would like to check your potential average earnings in the situation where **5** buyers allocate 2 EM to payment 2, **2** buyers allocate 3 EM, and **3** of the other six sellers accept payment 2, type in "**5**" in the field "# buyers with pay2=2", "**2**" in the field "# buyers with pay2=3", and "**3**" in the field "# other sellers accept pay2." You can create as many records as you wish at the start of each market.

In the lower-left section, you forecast what other participants will do in the new market. Enter an integer within the indicated range for each forecast. The seller's forecast of buyer's average payment 2 allcoation is counted as correct if it lies within ±1 of the realized value.

In the lower-right section, you choose how to split your 7 EM between the two payment methods if you are a buyer (Figure 1), and whether to accept payment 2 at a one-time fee of 2.8 EM if you are a seller (Figure 2).

Trading screen, Figures 3-4**.** In each of the 7 trading rounds, buyers decide whether to buy a unit of the seller's good using either payment 1 or payment 2. This decision depends on the buyer's remaining balances of payment 1 and payment 2, and whether or not the seller has agreed to accept payment 2; this information is shown on the buyer's computer screen (see the lower left box in Figure 3). Sellers do not choose at this stage, and can click on the "OK" button to review information on the waiting screen (see Figure 4). From round 2 on, the upper section of the screen reviews your activities in the previous round and in the current market up until then.

Waiting screen, Figures 5-6. At any point in the experiment if you finish your decision sooner than other participants, you will see a waiting screen with information on previous markets and your potential market earnings similar to what you observe on the payment choice screen.

Finally, sellers who invest in the one-time fixed cost to accept payment 2 may have a negative "market earnings" in one or a few rounds. As a result of this, you may see a message screen explaining the situation. After you have been alerted to this situation, you can click on the "continue" button on the screen to proceed.

Figure 1: buyer's payment allocation screen

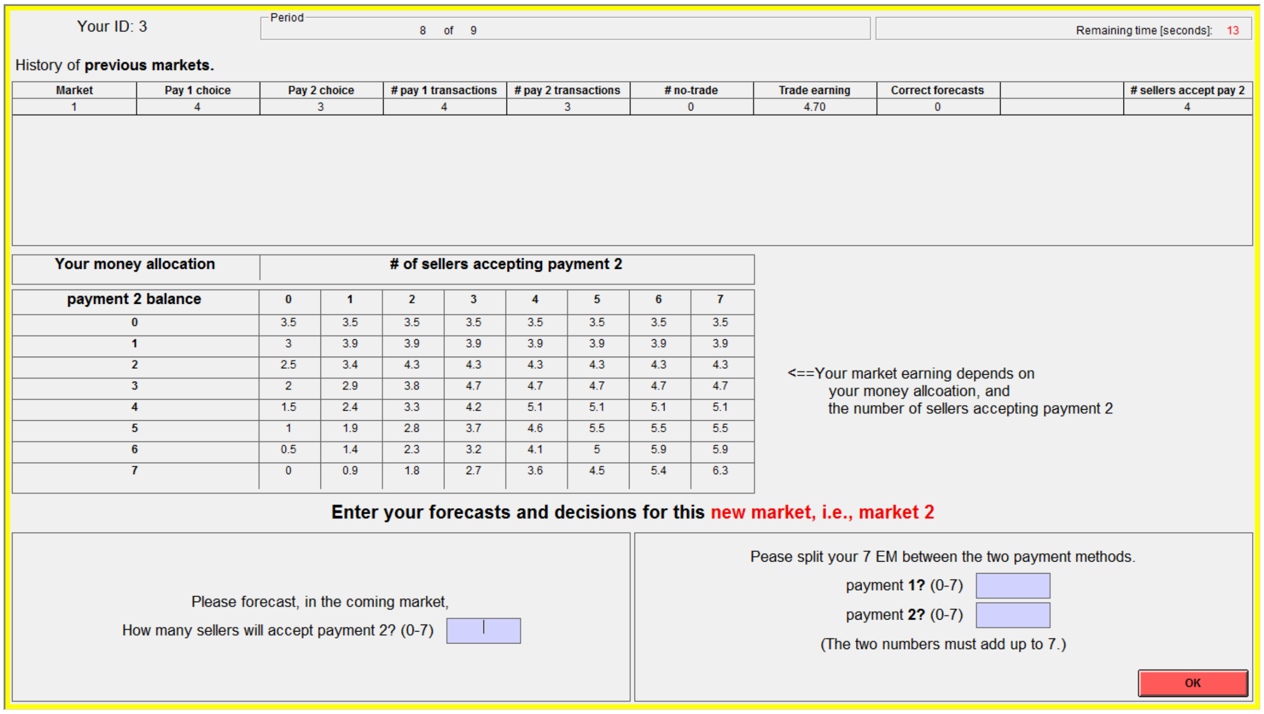


Figure 2: seller's payment 2 acceptance screen

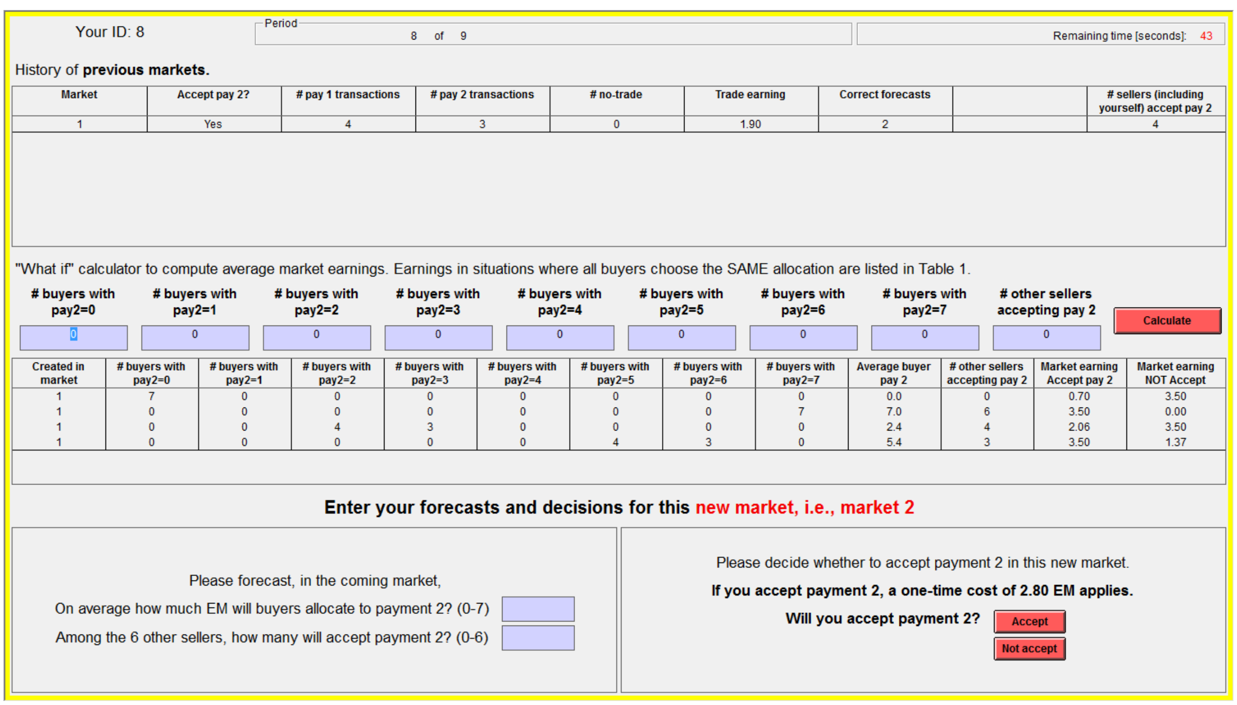


Figure 3: buyer's trading screen

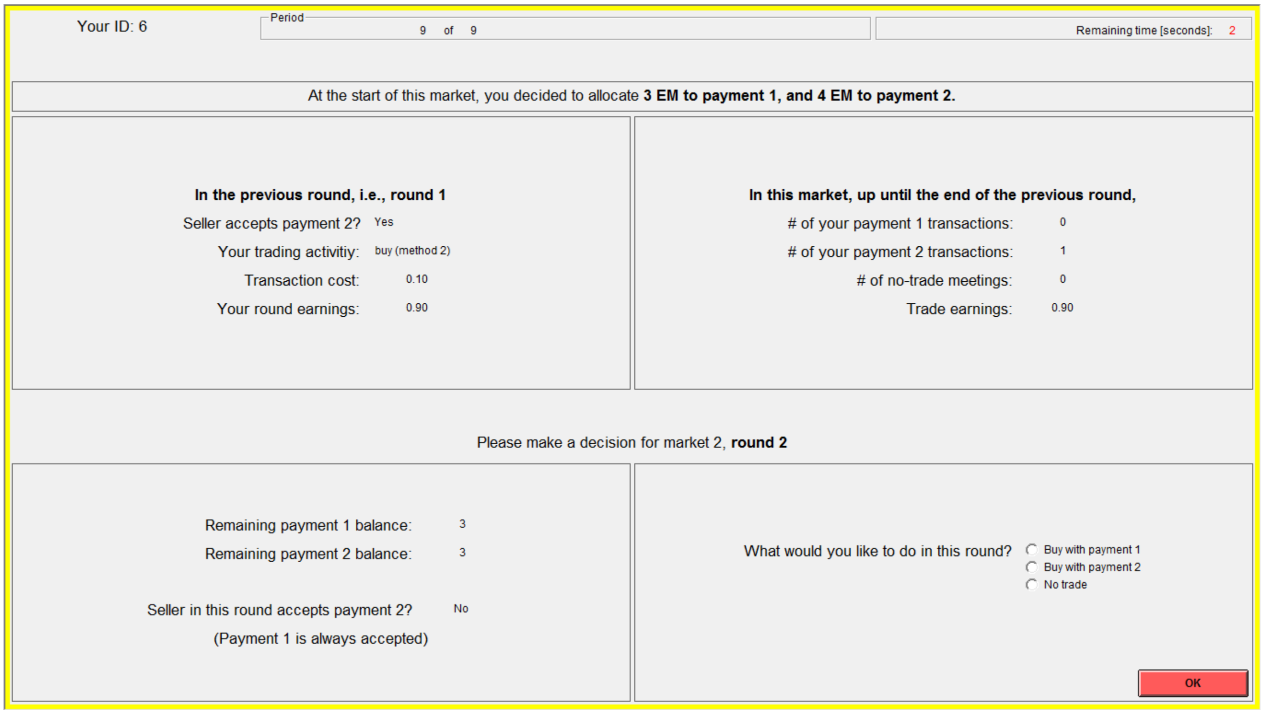


Figure 4: seller's trading screen

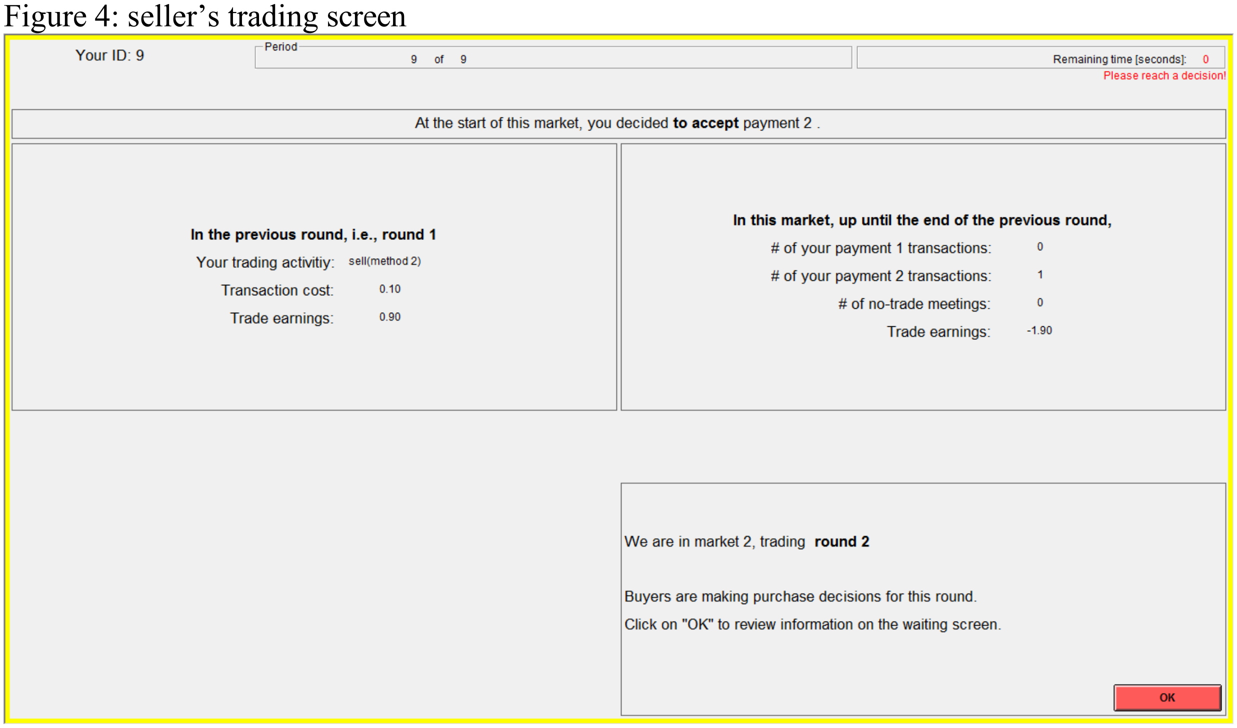
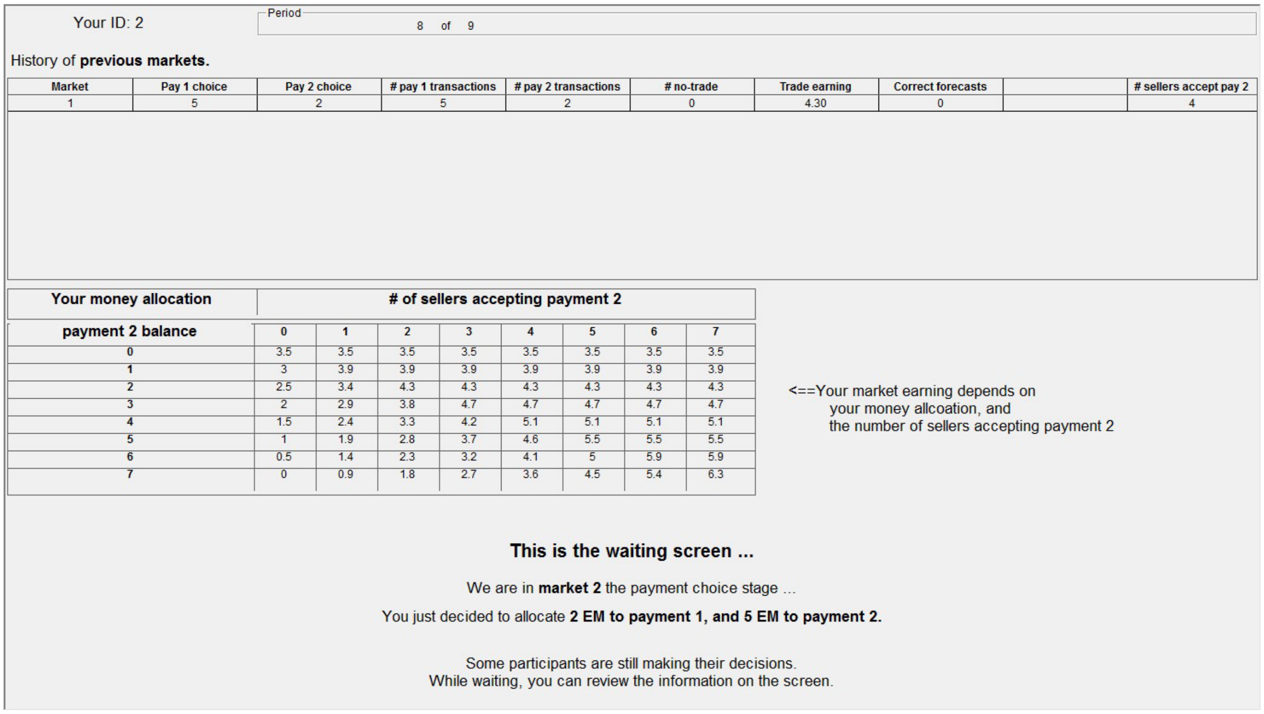


Figure 5: buyer's waiting/information screen



Your ID: 2

Period 8 of 9

History of **previous markets.**

Market	Pay 1 choice	Pay 2 choice	# pay 1 transactions	# pay 2 transactions	# no-trade	Trade earning	Correct forecasts		# sellers accept pay 2
1	5	2	5	2	0	4.30	0		4

Your money allocation	**# of sellers accepting payment 2**							
payment 2 balance	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
1	3	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2	2.5	3.4	4.3	4.3	4.3	4.3	4.3	4.3
3	2	2.9	3.8	4.7	4.7	4.7	4.7	4.7
4	1.5	2.4	3.3	4.2	5.1	5.1	5.1	5.1
5	1	1.9	2.8	3.7	4.6	5.5	5.5	5.5
6	0.5	1.4	2.3	3.2	4.1	5	5.9	5.9
7	0	0.9	1.8	2.7	3.6	4.5	5.4	6.3

<==Your market earning depends on
your money allcoation, and
the number of sellers accepting payment 2

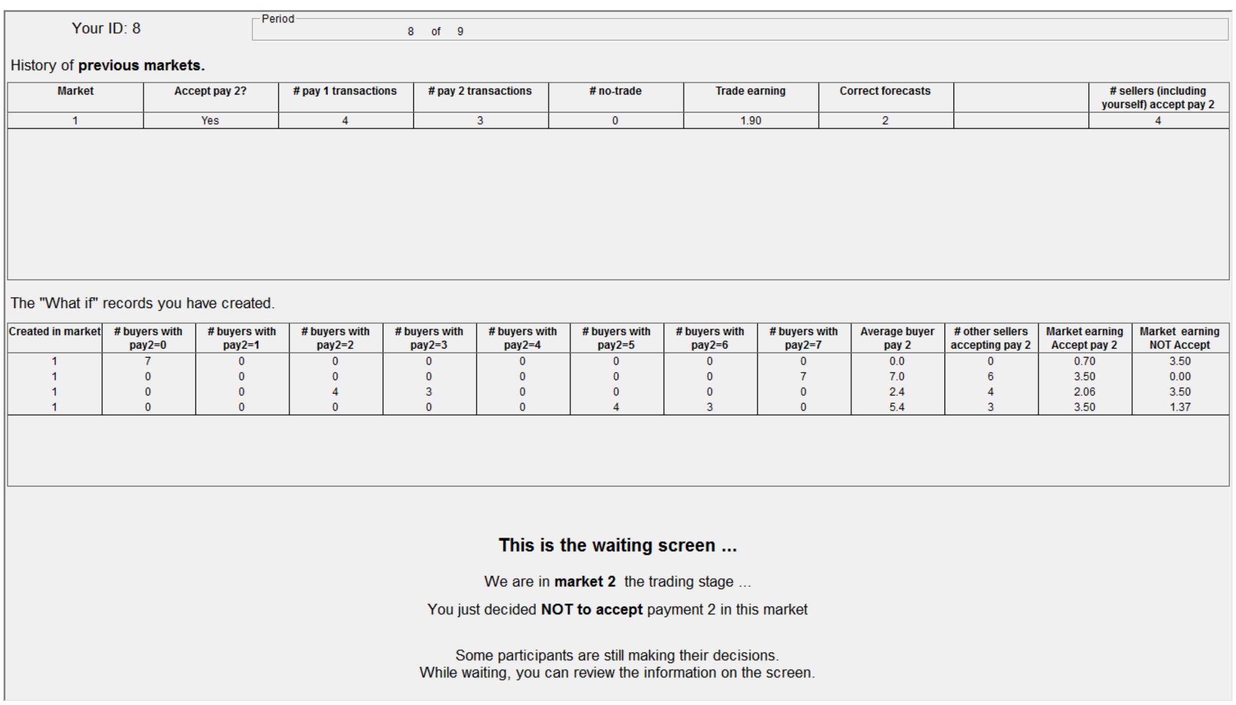
This is the waiting screen ...

We are in **market 2** the payment choice stage ...

You just decided to allocate **2 EM to payment 1, and 5 EM to payment 2.**

Some participants are still making their decisions.
While waiting, you can review the information on the screen.

Figure 6: seller's waiting/information screen



Your ID: 8

Period 8 of 9

History of **previous markets.**

Market	Accept pay 2?	# pay 1 transactions	# pay 2 transactions	# no-trade	Trade earning	Correct forecasts		# sellers (including yourself) accept pay 2
1	Yes	4	3	0	1.90	2		4

The "What if" records you have created.

Created in market	# buyers with pay2=0	# buyers with pay2=1	# buyers with pay2=2	# buyers with pay2=3	# buyers with pay2=4	# buyers with pay2=5	# buyers with pay2=6	# buyers with pay2=7	Average buyer pay 2	# other sellers accepting pay 2	Market earning Accept pay 2	Market earning NOT Accept
1	7	0	0	0	0	0	0	0	0.0	0	0.70	3.50
1	0	0	0	0	0	0	0	7	7.0	6	3.50	0.00
1	0	0	4	3	0	0	0	0	2.4	4	2.06	3.50
1	0	0	0	0	0	4	3	0	5.4	3	3.50	1.37

This is the waiting screen ...

We are in **market 2** the trading stage ...

You just decided **NOT to accept** payment 2 in this market

Some participants are still making their decisions.
While waiting, you can review the information on the screen.

Table 1: Seller's average market earnings

- This table considers the case where ***all buyers choose the same payment allocation;*** use the "what-if" calculator for cases where buyers make different allocations.
- The earnings for ***accepting*** payment 2 are in the ***upper-left*** corner,
- The earnings for ***not accepting*** payment 2 are in the ***lower-right*** corner.

All buyer's allocation to **payment 2**	# of **other 6 sellers** accepting payment 2							
	0	1	2	3	4	5	6	
0	0.7 3.5	0.7 3.5	0.7 3.5	0.7 3.5	0.7 3.5	0.7 3.5	0.7 3.5	←if accept pay 2 ←if not accept pay 2
1	3.5 3.0	2.1 3.5	1.6 3.5	1.4 3.5	1.3 3.5	1.2 3.5	1.1 3.5	
2	3.5 2.5	3.5 2.9	2.6 3.5	2.1 3.5	1.8 3.5	1.6 3.5	1.5 3.5	
3	3.5 2.0	3.5 2.3	3.5 2.8	2.8 3.5	2.4 3.5	2.1 3.5	1.9 3.5	
4	3.5 1.5	3.5 1.8	3.5 2.1	3.5 2.6	2.9 3.5	2.6 3.5	2.3 3.5	
5	3.5 1.0	3.5 1.2	3.5 1.4	3.5 1.8	3.5 2.3	3.0 3.5	2.7 3.5	
6	3.5 0.5	3.5 0.6	3.5 0.7	3.5 0.9	3.5 1.2	3.5 1.8	3.1 3.5	
7	3.5 0	3.5 0	3.5 0	3.5 0	3.5 0	3.5 0	3.5 0	

Table 2: Buyer's market earning

Your allocation to **payment 2**	# of sellers accepting payment 2							
	0	1	2	3	4	5	6	7
0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
1	3.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2	2.5	3.4	4.3	4.3	4.3	4.3	4.3	4.3
3	2.0	2.9	3.8	4.7	4.7	4.7	4.7	4.7
4	1.5	2.4	3.3	4.2	5.1	5.1	5.1	5.1
5	1.0	1.9	2.8	3.7	4.6	5.5	5.5	5.5
6	0.5	1.4	2.3	3.2	4.1	5.0	5.9	5.9
7	0.0	0.9	1.8	2.7	3.6	4.5	5.4	6.3

C Additional Analysis, Figures and Tables

In this Appendix, we provide additional analysis, figures and tables. Figures C.1 to C.3 plot the payoffs against market for each of the three treatments. Table C.1 shows the regression analysis with individual buyer data separately for each of the three treatments.

We also formally test whether a session converges to either of two symmetric strategy equilibria by estimating the process followed by three variables, the percentage of the buyers' endowment allocated toward payment 2 averaged across the seven buyers (bPay2%), the percentage of sellers accepting payment 2 (sAccept%), and the percentage of meetings that resulted in trade using payment 2 (Pay2Meetings%), over time. In particular, we run the following regression for each session and for each of these three variables:

$$y_{j,s} = \lambda_j y_{j,s-1} + \mu_j + \epsilon_{j,s}, \tag{C.1}$$

where $y_{j,s}$ is the value of the variable being tested in market s for session j. From (C.1), we say that the variable converges to its payment-1-only equilibrium value if the estimate of the long-run expected value for y_j, $\frac{\mu_j}{1-\lambda_j}$, is not significantly different from 0. Similarly, we say that the variable converges to its payment-2-only equilibrium value if $\frac{\mu_j}{1-\lambda_j}$ is not significantly different from 100. Table C.2 reports the estimates and standard errors for $1-\lambda_j$, $100-\frac{\mu_j}{1-\lambda_j}$ and $\frac{\mu_j}{1-\lambda_j}$; the p-values indicate whether the estimated variable is significantly different from 0. Thus, if $100-\frac{\mu_j}{1-\lambda_j}$ (alternatively $\frac{\mu_j}{1-\lambda_j}$) is significantly different from zero, then we can reject the hypothesis of convergence of that variable to the all-payment-2 (all-payment-1) equilibrium.

Table C.1: Buyer Payment 2 Choice (%) with Random Effects by Treatment

		T=1.6	T=2.8	T=3.5
	MktAcceptL(%)	**0.824*****	**0.352** ***	**0.392** ***
		(0.109)	(0.049)	(0.047)
Stage 1: bBelief(%)	market	**0.779** ***	**0.312** **	**-0.983** ***
		(0.203)	(0.153)	(0.187)
	location	1.401	**7.576** ***	-5.877
	(SFU=1;UCI=0)	(2.339)	(2.824)	(2.778)
	bBelief(%)	**0.828** ***	**0.916** ***	**1.013** ***
		(0.146)	(0.110)	(0.084)
Stage 2: bPay2(%)	market	**0.354** **	**0.104**	**0.037**
		(0.155)	(0.132)	(0.170)
	location	**3.944** *	**3.315**	**-1.091**
	(SFU=1;UCI=0)	(2.333)	(2.695)	(1.877)

Notes. (1) *p-value≤0.1; **p-value≤0.05; *** p-value≤0.01. (2) Each regression has 532=4x7x19 observations. There are 4 sessions, each with 7 buyers and 20 markets. For each individual, we have 19 observations as the first-stage regression uses a lagged variable as an independent variable. (3) The regressions have clustered errors at the individual subject level.

Table C.2: Test of Convergence to Symmetric Equilibrium

Treatment	Session		bPay2%			sAccept%			Pay2Meetings%		
			$1-\lambda$	$100-\frac{\mu}{1-\lambda}$	$\frac{\mu}{1-\lambda}$	$1-\lambda$	$100-\frac{\mu}{1-\lambda}$	$\frac{\mu}{1-\lambda}$	$1-\lambda$	$100-\frac{\mu}{1-\lambda}$	$\frac{\mu}{1-\lambda}$
	1	Coef.	0.255***	6.404	93.596***	0.792***	2.256	97.744***	0.213**	5.464	94.536***
		Std.Err.	0.092	6.152	6.152	0.243	1.596	1.596	0.088	7.698	7.698
	2	Coef.	0.346***	0.167	99.833***	1.059***	0.794	99.206***	0.338***	0.749	99.252***
T=1.6		Std.Err.	0.094	4.268	4.268	0.288	1.209	1.209	0.094	4.401	4.401
	3	Coef.	0.180*	2.782	97.218***	0.566***	4.863**	95.137***	0.182*	4.114	95.886***
		Std.Err.	0.107	9.271	9.271	0.130	2.314	2.314	0.098	9.198	9.198
	4	Coef.	0.504***	2.394	97.606***	1.118***	1.504	98.496***	0.336**	1.658	98.342***
		Std.Err.	0.143	2.828	2.828	0.288	1.131	1.131	0.136	4.561	4.561
	1	Coef.	0.793***	56.802***	43.198***	1.118***	52.632***	47.368***	0.949***	61.648***	38.352***
		Std.Err.	0.259	1.638	1.638	0.266	3.127	3.127	0.260	1.787	1.787
	2	Coef.	0.085	12.881	87.119***	0.718***	19.711***	80.289***	0.224**	26.806***	73.194***
T=2.8		Std.Err.	0.128	25.604	25.604	0.181	4.894	4.894	0.107	8.209	8.209
	3	Coef.	1.266***	32.104***	67.896***	1.244***	26.316***	73.684***	0.611*	37.652***	62.348***
		Std.Err.	0.255	1.020	1.020	0.207	2.809	2.809	0.332	2.856	2.856
	4	Coef.	0.586***	31.034***	68.966***	1.178***	29.096***	70.904***	0.172	29.749***	70.251***
		Std.Err.	0.174	2.246	2.246	0.322	2.987	2.987	0.180	1.799	11.799
	1	Coef.	0.051	121.447	-21.447	0.310*	79.948***	20.052	0.111	98.947***	1.053
		Std.Err.	0.097	123.719	123.719	0.164	14.086	14.086	0.122	38.359	38.359
	2	Coef.	0.301**	72.188***	27.812***	0.918***	72.516***	27.484***	0.762***	78.476***	21.524***
T=3.5		Std.Err.	0.142	6.520	6.520	0.179	4.073	4.073	0.173	2.983	2.983
	3	Coef.	0.891***	46.161***	53.839***	1.030***	46.573***	53.427***	1.097***	55.102***	44.898***
		Std.Err.	0.268	2.010	2.010	0.217	3.574	3.574	0.248	2.034	2.034
	4	Coef.	0.271	68.059***	31.941***	1.012***	68.403***	31.597***	0.920***	72.909***	27.091***
		Std.Err.	0.189	7.278	7.278	0.238	3.640	3.640	0.245	2.441	2.441

Notes. (1) *p-value≤0.1; p-value≤0.05; p-value≤0.01. (2) Number of observations: 19. (3) The estimate of the long-run equilibrium value of bPay2% is negative from the unconstrained estimation, but it is not significantly different from zero. A constrained estimation that restricts $\mu \geq 0$ will give $\hat{\mu} = 0$.

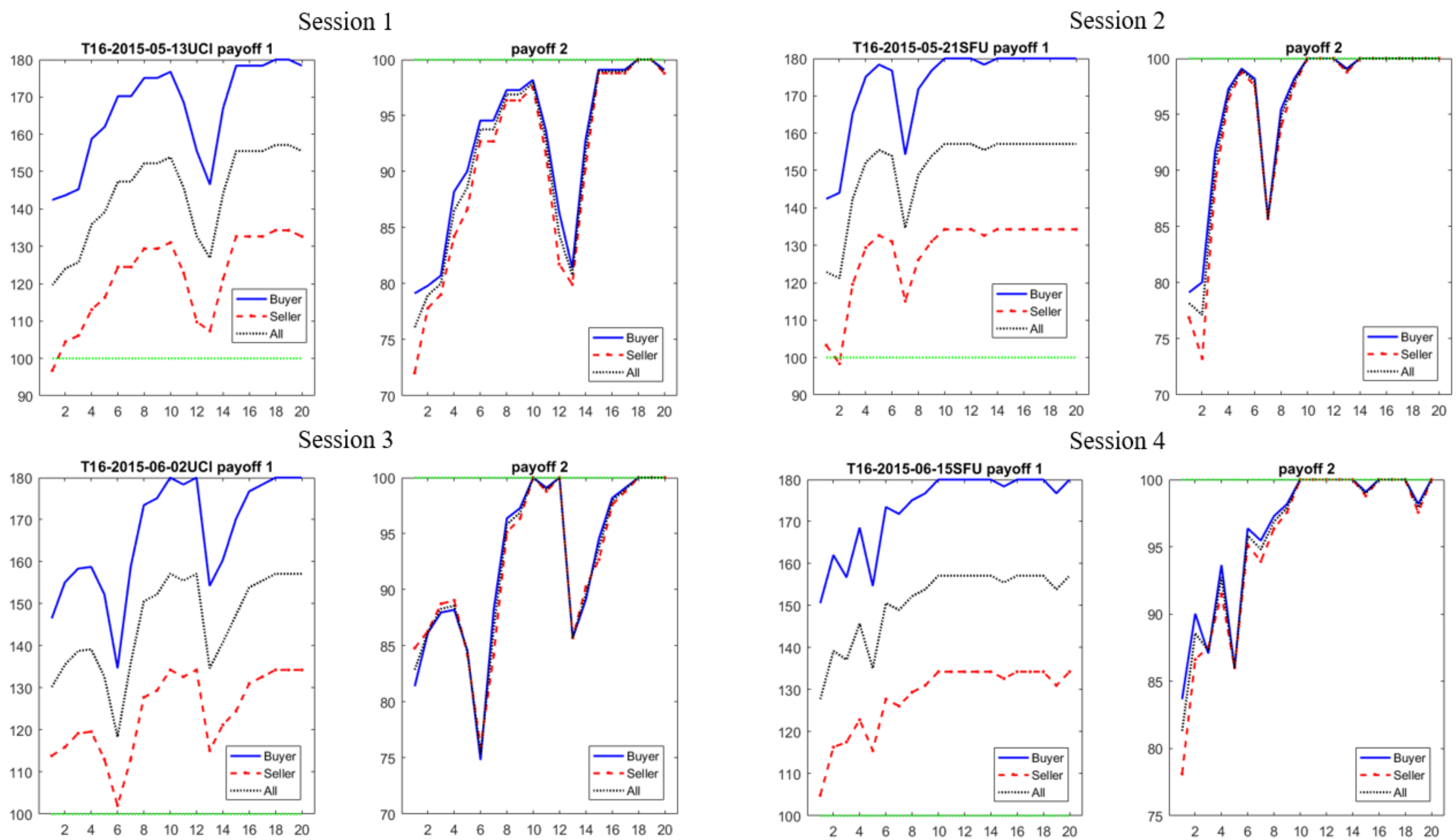


Figure C.1: Payoff T=1.6

Notes. (1) Horizontal axis: market. (2) There are two figures for each session. The first figure shows subjects' payoffs normalized by the payoffs in the payment-1 equilibrium as the benchmark (100%). The blue solid line represents sellers, the red dashed line represents buyers and the black line marked with circles represents buyers and sellers together. The second figure shows payoffs normalized by payoffs in the payment-2 equilibrium as the benchmark.

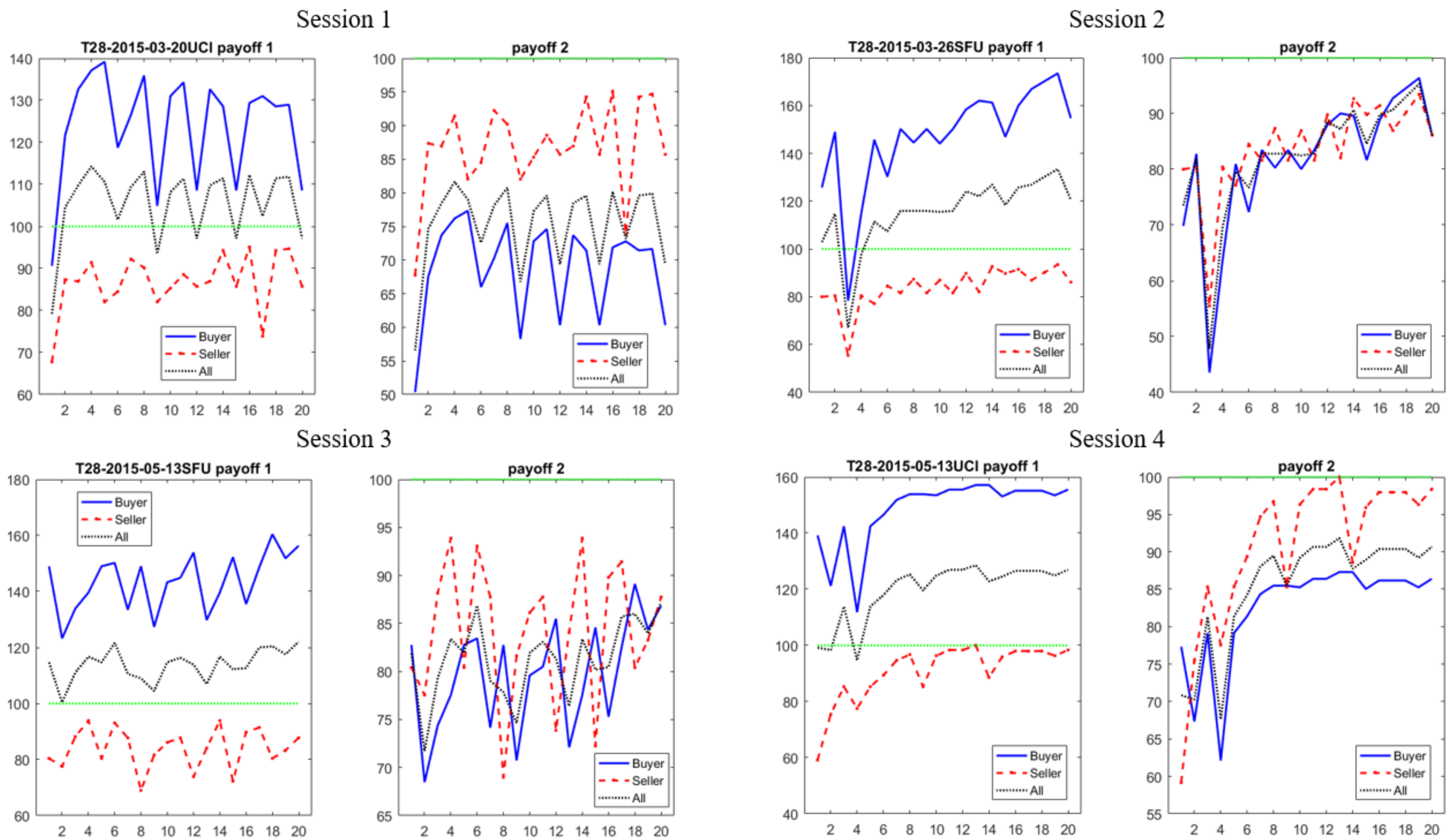


Figure C.2: Payoff T=2.8

Notes. (1) Horizontal axis: market. (2) There are two figures for each session. The first figure shows subjects' payoffs normalized by the payoffs in the payment-1 equilibrium as the benchmark (100%). The blue solid line represents sellers, the red dashed line represents buyers and the black line marked with circles represents buyers and sellers together. The second figure shows payoffs normalized by payoffs in the payment-2 equilibrium as the benchmark.

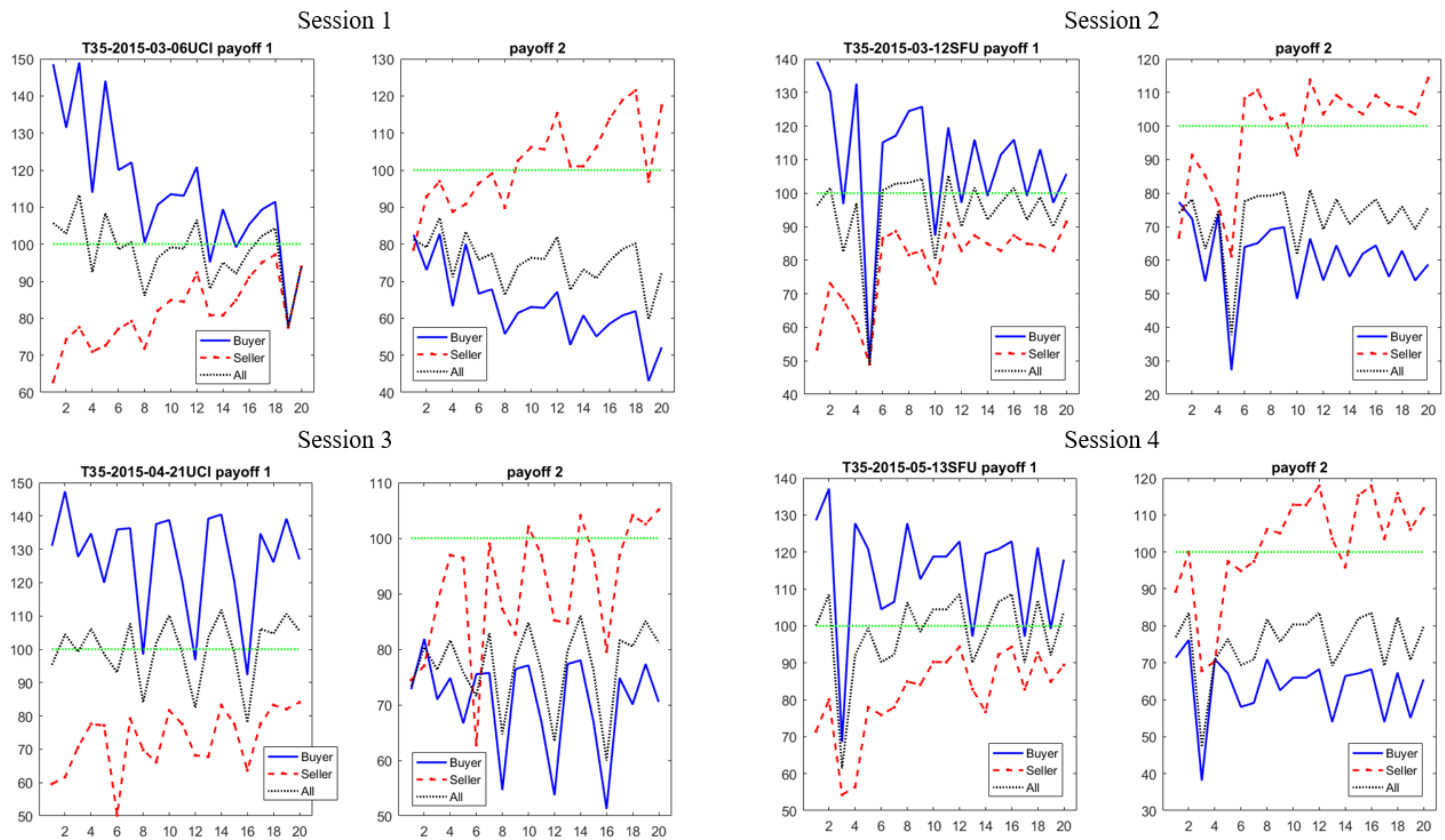


Figure C.3: Payofff T=3.5

Notes. (1) Horizontal axis: market. (2) There are two figures for each session. The first figure shows subjects' payoffs normalized by the payoffs in the payment-1 equilibrium as the benchmark (100%). The blue solid line represents sellers, the red dashed line represents buyers and the black line marked with circles represents buyers and sellers together. The second figure shows payoffs normalized by payoffs in the payment-2 equilibrium as the benchmark.

D Individual Evolutionary Learning Model

In this Appendix, we provide more detailed information about the IEL and we report on additional simulation results using that model.

Regarding IEL, we first discuss how to calculate the foregone payoff. Second, we describe how sellers update their expectations about the average amount that buyers allocated to payment 2, which they use to calculate the foregone payoff. Third, we describe the process of experimentation. Third, we describe our IEL convergence criteria, and present the results of average times to convergence and stability of equilibrium outcomes for the four values of fixed cost that were used in our experimental economies. Finally, we use the IEL to explore the "tipping point" for T regarding adoption of the new payment method, and the effects of reducing the seller's payment costs which increases their gains from trade.

Forgone Payoff Calculation

First we describe how to calculate the foregone payoff calculation depends on whether an agent is a buyer or a seller.

At the end of each period, buyers know the number of sellers who actually accepted payment 2 in that period, $s_a(t) \in \{0, 1, ..., 7\}$. For buyers, the foregone payoff of each rule $m^i_{b,j}(t)$ in buyer i's set at the end of market t is computed in the following way.

$$\Pi^i_{b,j}(t) = (7 - m^i_{b,j}(t))(u - \tau_1) + \min\left[s_a(t), m^i_{b,j}(t)\right](u - \tau_2).$$

Note that in our simulation, we assume that the buyer adopts the following (payoff-maximizing) strategy (given her initial payment allocation): if the buyer meets a seller who accepts payment 2, then the buyer uses payment 2 if he still has payment 2 left and she uses payment 1 otherwise; if the seller does not accept payment 2, then the buyer uses payment 1 if he still has some payment 1 left and she does not trade otherwise. Note that if $m^i_{b,j}(t)$ is larger than $s_a(t)$, then $s_a(t)$ is used in the calculation and there is missing trade in some rounds, where the buyer has only payment 2 left and the seller does not accept it.

The computation of sellers' foregone payoffs is more complex. For each seller, we use two variables to compute the foregone payoffs of all the rules in a seller's set. The first variable is $s^{-i}_a(t) \in \{0, 1, ..., 6\}$, the number of sellers excluding seller i that accepted payment 2. Recall that this information was provided to sellers at the end of each market of the experiment. The second variable is $s^f \bar{m}^i_b(t) \in \{0, 1, ..., 7\}$, the forecast of seller i of the average allocation to payment 2 by all 7 buyers. Note that in our experiment buyers' allocations to payment 2 are not public knowledge, but we did elicit sellers' forecasts of buyers' average allocation to payment 2. Thus, our artificial agents, like the human subjects, must form an expectation of this value. The updating of this expectation is seller-specific and depends on each seller's experience from the previous period; the details of this updating are given in the next section "Seller Belief Formation." After we have $s^{-i}_a(t)$ and $s^f \bar{m}^i_b(t)$, we use them to evaluate foregone payoffs for all of the rules in a seller's rule set in three steps.

First, we calculate the expected number of transactions that would have been completed using payment 2 provided that the seller had accepted payment 2:

$$n^{i,a}(t) = 7 * \min\left\{s^f \bar{m}^i_b(t)/(s^{-i}_a(t) + 1), 1\right\}, \tag{D.1}$$

and the expected profit from doing so (note that $7 - n^{i,a}(t)$ transactions use payment 1):

$$\pi_s^{i,a} = n^{i,a}(t)(u - \tau_2) + (7 - n^{i,a}(t))(u - \tau_1) - T. \tag{D.2}$$

Second, we calculate the expected number of transactions involving payment 1 that would have taken place if the seller did not accept payment 2:

$$n^{i,n}(t) = 7 * \min\left\{(7 - s^f \bar{m}_b^i(t))/(7 - s_a^{-i}(t), 1\right\}, \tag{D.3}$$

and the expected payoff from doing so (note that transactions can only be carried out with payment 1):

$$\pi_s^{i,n}(t) = n^{i,n}(t)(1 - \tau_1). \tag{D.4}$$

Finally, for each rule j that is in seller i's rule set, we calculate the expected foregone payoff as the weighted average of $\pi_s^{i,a}(t)$ and $\pi_s^{i,n}(t)$:

$$\Pi_{s,j}^i(t) = m_{s,j}^i(t)\pi_s^{i,a}(t) + (1 - m_{s,j}^i(t))\pi_s^{i,n}(t). \tag{D.5}$$

Seller Belief Formation

Below we describe the process by which sellers update their expectations about the average amount that buyers allocated to payment 2, $s^f \bar{m}_b^i(t)$, which is used to calculate the foregone payoff for sellers. This is carried out in four steps.

Step 1. Infer the boundaries on the initial payment 2 allocation of each trading partner (one for each of the seven rounds of transaction) in the past market.

Note that in the experiment, a seller does not know a buyer's initial payment allocation and must infer it with a limited information set, which includes (i) whether the seller herself accepted payment 2 or not, (ii) how many of the other six sellers chose to accept payment 2, (iii) in which round (out of seven) she meets the buyer, and (iv) whether the transaction uses payment 1, payment 2 or fails to take place. In many situations, the seller will not be able to exactly pinpoint the buyer's initial choice, but she can always infer either the lower bound (call it a *Min inference*) or the upper bound (call it a *Max inference*) of the buyer's payment 2 allocation.

Let r refer to the current round, M to the number of sellers ($M = 7$), and $s_a^{-i}(t)$ the number of other sellers who accepted payment 2 in the past market. Table D.1 summarizes what the seller can infer about her round r trading partner's initial payment 2 allocation (assuming that the buyer behaves optimally). There are four cases to consider, with the first two applying to a seller who did not accept payment 2, and the other two cases applying to a seller who accepted payment 2.

In case A, the seller chose to not accept payment 2 and no transaction occurred for the round in question. The seller knows that the buyer in that round had no payment 1 available – this implies a maximum that the buyer allocated to payment 1 at the beginning of the market, or a minimum allocated to payment 2. The value of this minimum is given by $8 - r + (r - 1) * s_a^{-i}(t)/(M - 1)$. We illustrate this case with two examples, one assuming that all other sellers accepted payment 2, or $s_a^{-i}(t) = 6$, and the other assuming that none of the other sellers accepted payment 2, or $s_a^{-i}(t) = 0$ (and we do the same with the other three cases).

Table D.1: Seller's guess about buyer's initial payment 2 allocation

Case	Transaction	P2 Accepted?	Buyer initial P2 allocation
A	None	No	Min: $m^b \geq 8 - r + (r-1) * s_a^{-i}(t)/(M-1)$
B	Use P1	No	Max: $m^b \leq 7 - r + (r-1) * s_a^{-i}(t)/(M-1)$
C	Use P1	Yes	Max: $m^b \leq (r-1) * s_a^{-i}(t)/(M-1)$
D	Use P2	Yes	Min: $m^b \geq 1 + (r-1) * s_a^{-i}(t)/(M-1)$

Notes: P1 (P2) is short for payment 1 (payment 2).

Example A1. Suppose $s_a^{-i}(t) = 6$. The seller knows that no matter which round it is, the buyer had not needed to spend payment 1 until the buyer met the seller herself. If the buyer did not have payment 1, it is because he chose to allocate all his 7 units to payment 2. In this example, the seller can infer exactly that the buyer chose $m^b = 7$.

Example A2. Suppose $s_a^{-i}(t) = 0$. The seller's guess depends on the round of the transaction. If $r = 1$, then the seller knows exactly that the buyer's payment 2 allocation was $8 - 1 = 7$ (and the initial balance of payment 1 is 0). If $r = 2$, then the buyer's initial payment 1 balance could be either 0 (in which case he did not trade in the first round), or 1 (in which case he paid with payment 1 in the first round); equivalently, his initial payment 2 allocation was either 6 or 7 (so the minimum is $8 - 2 = 6$). For each round, going further in time, the seller has less and less precise information about the buyer's initial choice because she does not know how many times the buyer has used payment 1 in the previous rounds.

In case B, the seller did not accept P2 and a transaction took place with P1. Since the buyer had P1 to use, there was a minimum that this buyer allocated to P1, or a maximum allocated to P2. The value of this maximum is given by $7 - r + (r-1) * s_a^{-i}(t)/(M-1)$.

Example B1. Suppose $s_a^{-i}(t) = 6$. The seller knows that the buyer initially allocated at least 1 unit of payment 1, but this is all she can infer: the buyer could have more payment 1 in hand to spend in later rounds and/or might have spent some payment 1 in previous rounds. Equivalently, the seller can only infer that the buyer had initially at most 6 units in payment 2.

Example B2. Suppose $s_a^{-i}(t) = 0$. The seller can infer that the buyer initially allocated at least r units of payment 1 if he still has payment 1 to spend in round r. Equivalently, the buyer allocated at most $7 - r$ units in payment 2 initially. As the round number increases, the seller acquires more precise information about the buyer's initial choice. If the buyer still had payment 1 in round 7, then the seller knows exactly that the buyer chose to allocate all his money to payment 1 and nothing to payment 2.

In case C, the seller accepted payment 2 but the buyer used payment 1. This implies that the buyer had no payment 2 left. This sets a maximum on how much the buyer allocated to payment 2. The value of the maximum is given by: $(r-1) * s_a^{-i}(t)/(M-1)$.

Example C1. Suppose $s_a^{-i}(t) = 6$. The seller knows that the buyer ran out of payment 2 in previous rounds, but she is not sure how many times the buyer had used payment 2 in the previous rounds: the number can vary from 0 to $r - 1$. As the round goes on, the seller's inference becomes less accurate.

Example C2. Suppose $s_a^{-i}(t) = 0$. The seller can infer exactly that the buyer allocated nothing to payment 2 irrespective of which round it is because the buyer could not spend payment 2 in previous rounds.

In case D, the seller accepted payment 2, and the buyer paid using payment 2. This implies that there is a minimum amount that the buyer allocated to payment 2. The value of the limit is given by

$1 + (r - 1) * s_a^{-i}(t)/(M - 1)$.

Example D1. Suppose $s_a^{-i}(t) = 6$. Since the buyer still had payment 2 in round r, the seller can infer that the buyer had at least r units of payment 2 initially. As the round number increases, the seller has more accurate information about the buyer's portfolio choice. In round 7, the seller knows that the buyer chose to allocate all his money to payment 2.

Example D2. Suppose $s_a^{-i}(t) = 0$. The seller's inference about the buyer's initial portfolio choice is very imprecise: she only knows the buyer has at least 1 unit of payment 2 to spend in this round, but has no idea whether the buyer had used payment 2 in previous rounds and still had more payment 2 to spend in later rounds.

Step 2. Evaluate the accuracy of the seven inferences in step 1. A Min (Max) inference with a larger (smaller) bound implies a smaller set of possible values for the buyer's P2 (and P1) allocation and is more accurate. We use the *certainty value* (CE) to quantify the accuracy of these inferences. The CE is calculated as 8 minus the number of elements in the set of possible values of the buyer's payment 2 allocation; as a result, a smaller set is awarded a higher CE. For example, an inference with $m^b \geq 7$ implies a set with a single element $\{7\}$, so its CE is $8 - 1 = 7$. An inference with $m^b \leq 4$ implies the set $\{0, 1, 2, 3, 4\}$ with 5 elements, so its CE is $8 - 5 = 3$. Equivalently, the following formula can be used to calculate the CE:

$$CE = \begin{cases} x \text{ for inference } m^b \geq x, \\ 7 - x \text{ for inference } m^b \leq x. \end{cases}$$

Step 3. Use the lower and upper bounds for the seven inferences to estimate the lower and upper bounds for the "average" buyer. The "average" lower (upper) bound is calculated as the sum of the lower (upper) bounds of all Min (Max) inferences, weighted by their CEs calculated in step 2.

Step 4. The final step is to use the "average" lower and upper bounds to calculate the expectation about the average buyer's P2 allocation, $s^f \bar{m}_b^i(t)$, as the weighted sum of the two "average" bounds, with the weight of the lower (upper) average bound being given by the number of Min (Max) inferences.

Experimentation

In this section, we describe the parameterization of the experimentation rate and the standard deviation of experimentation. The rate of experimentation μ_t is

$$\mu_t = \frac{0.35}{1 + (t - 1)/5000},$$

where t is the current period at which experimentation occurs. The initial rate of experimentation, μ_1, is set to 0.35. The rate of experimentation slowly decreases as t increases. The standard deviation of experimentation σ_t is

$$\sigma_t = \frac{3.5}{1 + (t - 1)/5000}$$

The initial value of 3.5 is the midpoint of the buyer's strategy choice set of allocating 0 to 7 EM to payment 2. The standard deviation of experimentation also decays slowly over time.

Convergence Criteria

We define the following convergence criteria.

If, in a given period t, 85% of buyers' aggregate units are placed in payment 1, and 85% of sellers do not accept payment 2, then we classify that outcome as the payment 1 equilibrium outcome.

Similarly, if, in a given period t, 85% of buyers' aggregate units are placed in payment 2, and 85% of sellers accept payment 2, then the outcome in that period is classified as the payment 2 equilibrium outcome.

We declare the *time to convergence* as the first period in which either of the above criteria is satisfied in a simulation that criterion continues to be satisfied at least twice more in the following 10 periods.

The *mean time to convergence* reported on in Table D.2 measures the average time to convergence over 50 simulations for different values of T. We also report in that table the standard deviation, median, minimum and maximum of time to convergence from our simulation exercises.

After the time to convergence is recorded, we continue running the simulation for at least another 100 periods to examine the stability of the convergence result. Our *stability index*, reported in the final column of Table D.2 gives the percentage of periods when a convergence criterion is met out of the 100 periods following the recorded convergence period.

The first four rows of Table D.2 reports on convergence times and stability for the four values of T considered in our experiment. We see that convergence to the all payment 2 equilibrium obtains for $T = 1.6$ and 2.8 while the all payment 1 equilibrium is the convergent outcome under higher values, $T = 3.5$ and 4.5.

Additional Results

We use the IEL model to conduct two sets of additional analysis. First, we explore where the "tipping point" for T lies regarding adoption of the new payment method. As our simulations suggest that the new payment method is adopted by the end when $T = 2.8$, while it is discarded by the end when $T = 3.5$, the tipping point value of T must lie between these two values. Therefore, we ran simulations of the IEL model for values of T ranging from 2.9 to 3.4, holding all else constant. The results are shown in the middle section of Table D.2. We observe that in this region for the fixed adoption cost T, the level of stability is low as revealed by our stability index. However, for $T = 3.1$ a majority (54%) of simulations converge to the all payment 2 equilibrium while for $T = 3.2$ a majority (54%) of simulations converge to the all payment 1 equilibrium, so we may regard $T = 3.1$ as approximating the tipping point.

Second, we examine the effects of reducing the seller's payment costs which increases their gains from trade. Intuitively, this change should promote further acceptance of payment 2 as sellers try to secure more trade. The simulation results support this intuition. Section 3 of Table D.2 reports the convergence results as we reduce the seller's payment cost terms, τ_1, τ_2, and T, all by 50% (doing so keeps $T/(\tau_1 - \tau_2)$ constant relative to the reference treatment in our experiment). Here we also consider the additional case of $T = 5.5/2 = 2.75$.

As these simulation results reveal, the reduction in sellers' costs increases the region for which the all payment 2 equilibrium is achieved. For example, when $T = 3.5/2 = 1.75, \tau_1 = 0.5/2, \tau_2 = 0.1/2$, all 50 simulated economies converge to the equilibrium where all players use the new payment method in the end, while they all converged to the equilibrium with use of the old payment method by the end when the cost terms are taken from the corresponding treatment of our experiment. When $T = 4.5/2, \tau_1 = 0.5/2, \tau_2 = 0.1/2$, the lower seller costs result in 68% of runs converging to use of the new payment method, while they all converged to the equilibrium with the old payment method when $T = 4.5, \tau_1 = 0.5, \tau_2 = 0.1$ as in the corresponding treatment in our experiment. For large enough values for T, namely $T = 5.5/2, \tau_1 = 0.5/2, \tau_2 = 0.1/2$, we still observe convergence to the all payment 1 equilibrium.

Table D.2: Convergence Times and Stability Analysis

Seller cost terms			Equilibrium	Time to Convergence					Stability
T	τ_1^s	τ_2^s	Outcome	Mean	Median	Min	Max	Std	Index
Section 1: parameters as in the experiment									
1.6	0.5	0.1	payment 2	8.5	8	5	13	1.9	98%
2.8	0.5	0.1	payment 2	76.9	69	12	233	47.8	88%
3.5	0.5	0.1	payment 1	49.2	40	15	119	28.3	90%
4.5	0.5	0.1	payment 1	7	7	3	11	1.9	99%
Section 2: T values between 2.8 and 3.5									
2.9	0.5	0.1	payment 2 82%	76	52	15	290	65.5	61%
3.0	0.5	0.1	payment 2 58%	92.6	71.5	15	274	65.6	51%
3.1	0.5	0.1	payment 2 54%	81.5	65	15	236	49.9	51%
3.2	0.5	0.1	payment 2 46%	82.3	66.5	21	297	58.8	44%
3.3	0.5	0.1	payment 2 38%	89.9	76.5	29	311	56.4	45%
3.4	0.5	0.1	payment 2 16%	59.6	48.5	15	214	39.1	58%
Section 3: Seller cost reduced by 50% relative to the experiment									
0.8	0.25	0.05	payment 2	9	8.5	5	17	2.4	99%
1.4	0.25	0.05	payment 2	34	33.5	10	85	17.3	90%
1.75	0.25	0.05	payment 2	57.3	54	9	151	30.6	87%
2.25	0.25	0.05	payment 2 68%	146.4	103	18	573	123.3	63%
2.75	0.25	0.05	payment 1	18.8	17	8	36	6.7	93%

Notes. (1) For each set of parameter values we run a set of 50 simulations. The number of markets is 400, except for $T = 3.0$ to 3.4, where it is 500, and for $T = 2.25$, where it is 1000. The large number of markets guarantees that *all* 50 simulated economies meet the convergence criterion at least 100 markets before the end of the simulation so that we can calculate the stability index for each simulated economy. (2) Unlike in the simulations with 20 markets as shown in Figure 5, for these simulations, the initial rules are drawn from the uniform distribution from 0 to 7 for buyers, and the uniform distribution from 0 to 1 for sellers. We do not scale the initial rules to match the average starting values of bPay2% and sAccept% in Tables 2 and E.1, as the simulation results are very robust to the starting values. In addition, these simulations involve parameter values not used in our experiment and therefore we do not have empirical counterparts of average bPay2% and sAccept%.

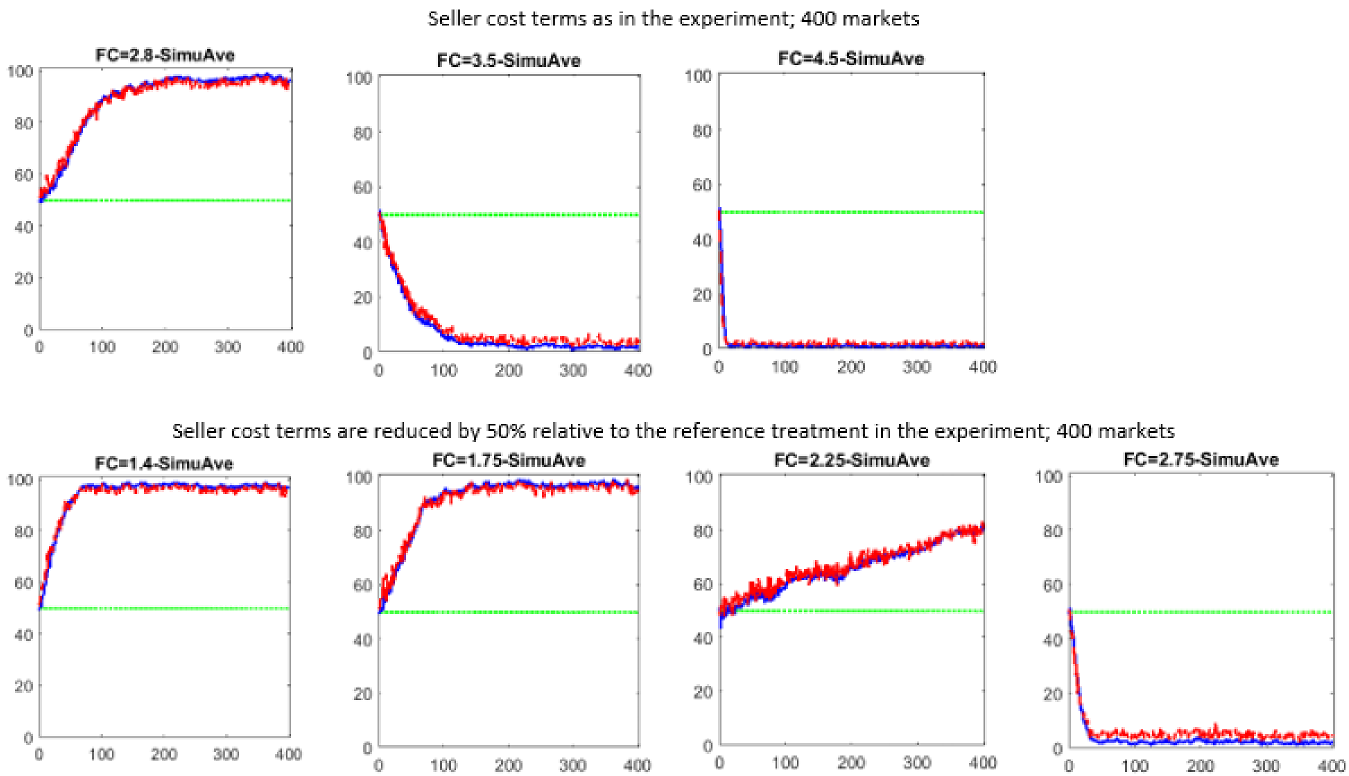


Figure D.1: Effects of Reducing Seller Payment Costs

Notes. The figure shows how the simulated IEL economies change in response to a decrease in seller payment costs. In each figure, the horizontal axis indicates the market number 1-400, the red line is the percentage of sellers accepting payment 2 and the blue line is the percentage of buyers' endowment allocated to payment 2. As a reference, the first row shows the average across 50 simulated economies for 400 markets when the seller's cost terms are exactly as in the experiment. The second row shows the simulation results where all the sellers' cost terms are reduced by 50% relative to the reference treatment in the experiment. We skip treatment with $T = 1.6$ as the figures before and after the reduction in cost terms are almost the same. For $T/(\tau_1 - \tau_2) = 5.5/0.4$, we only show the case with reduced cost terms as we do not have a corresponding experimental treatment.

Figure D.1 shows the simulated path of buyers' allocation to payment 2 and sellers' adoption of payment 2. The simulations shown in this figure are means from 50 runs over 400 markets (the long time horizon allows us to observe the convergence pattern). The top panel of the figure shows simulation results for the parameterizations used in our experiment, while the bottom panel shows the corresponding long-run outcomes from cutting the seller's costs in half. Consistent with the results reported in Section 3 of Table D.2, we find that when we cut all of the sellers' costs in half, the "tipping point" for which the long-run outcome sticks to the old (instead of switching to the new payment method) now lies at a higher value for $T/(\tau_1 - \tau_2)$, somewhere between $T = 4.5/0.4$ and $T = 5.5/0.4$.

E Graphs and Tables for Treatment T=4.5

Table E.1: Payment Choice and Usage $T = 4.5$

	Session	1	2	3	4	**all**
bPay2%	Session mean	21	22	29	34	**26**
	first market	47	47	67	47	**52**
	last market	8	4	8	8	**7**
sAccept%	Session mean	16	15	18	24	**18**
	first market	57	57	71	71	**64**
	last market	29	0	0	29	**14**
pay2Meetings%	Session mean	12	12	14	20	**14**
	first market	41	41	61	45	**47**
	last market	8	0	0	8	**4**
pay1Meetings%	Session mean	79	78	71	66	**74**
	first market	53	53	33	53	**48**
	last market	92	96	92	92	**93**
noTradeMeetings	Session mean	9	10	15	15	**12**
	first market	6	6	6	2	**5**
	last market	0	4	8	0	**3**

Table E.2: Payoff $T = 4.5$

Part 1: payment-2 equilibrium as benchmark						
	Session	1	2	3	4	**all**
buyer	session mean	55	55	53	56	**55**
	first market	70	70	79	74	**74**
	last market	59	53	51	59	**56**
seller	session mean	153	155	142	137	**147**
	first market	103	103	99	82	**97**
	last market	136	187	179	136	**159**
Part 2: payment-1 equilibrium as benchmark						
buyer	session mean	100	99	96	101	**99**
	first market	127	127	143	134	**132**
	last market	107	96	92	107	**100**
seller	session mean	79	80	73	71	**76**
	first market	53	53	51	42	**50**
	last market	70	96	92	70	**82**

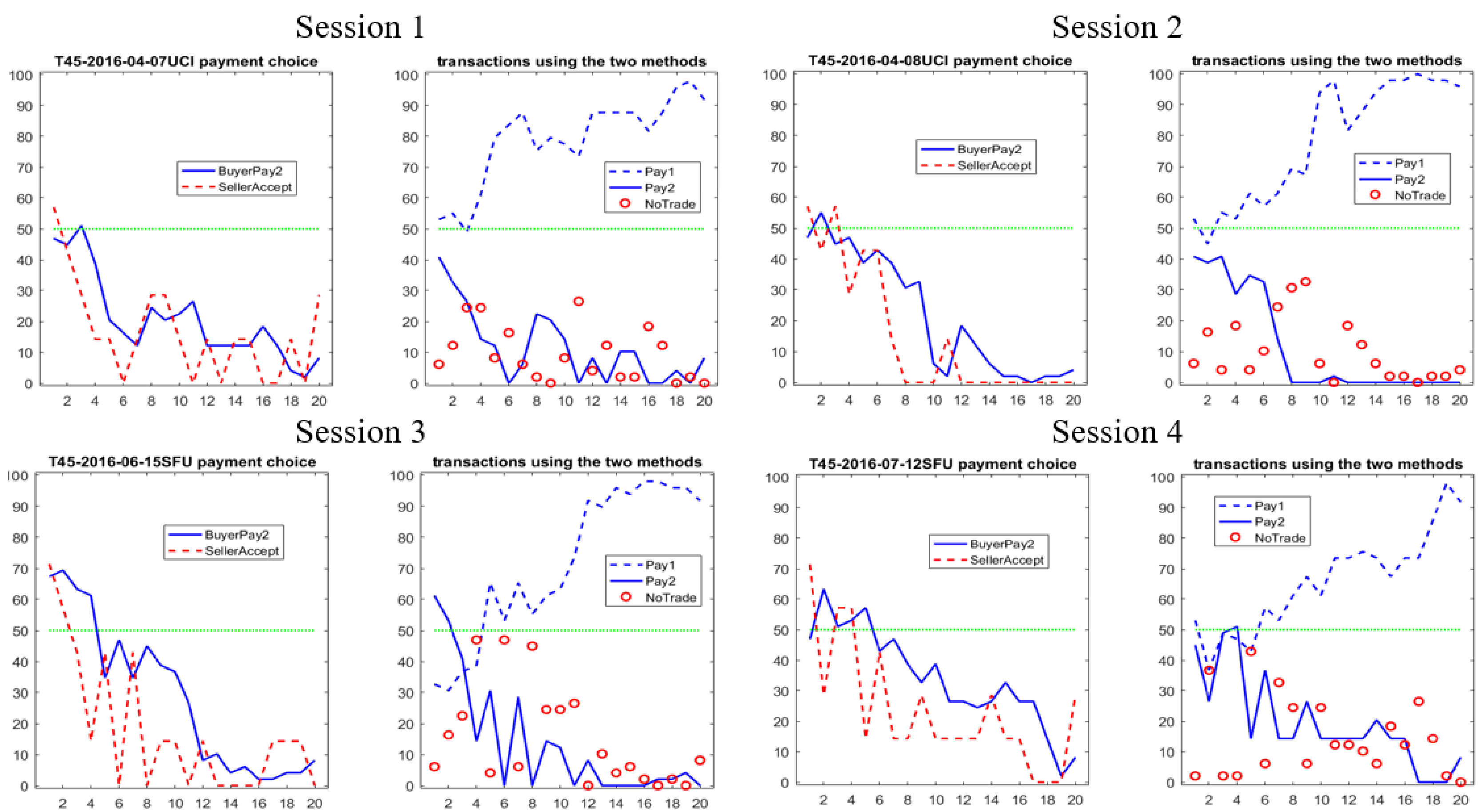


Figure E.1: Payment Choice and Usage T=4.5

Notes. (1) Horizontal axis: market. (2) There are two figures for each session. The first shows payment choices: the blue solid line represents the percentage of money allocated to payment 2, averaged across the seven buyers; the red dashed line represents the percentage of the seven sellers accepting payment 2. The second figure describes payment usage. The solid blue line is the percentage of meetings using payment 2; the dashed blue line is the percentage of meetings using payment 1; red circles are the percentage of meetings where no trade takes place.

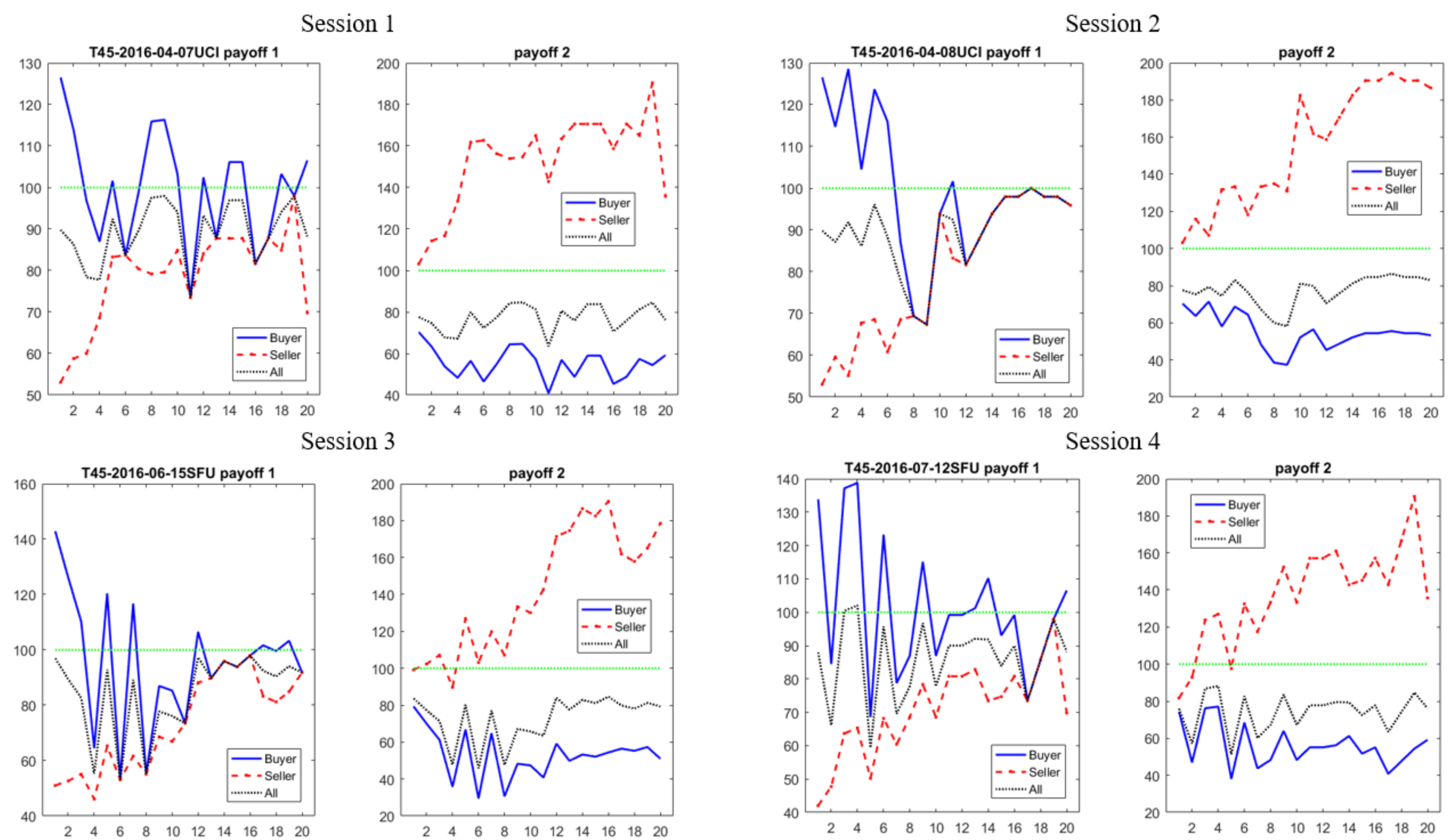


Figure E.2: Payoff T=4.5

Notes. (1) Horizontal axis: market. (2) There are two figures for each session. The first figure shows subjects' payoffs normalized by the payoffs in the payment-1 equilibrium as the benchmark (100%). The blue solid line represents sellers, the red dashed line represents buyers and the black line marked with circles represents buyers and sellers together. The second figure shows payoffs normalized by payoffs in the payment-2 equilibrium as the benchmark.

Table E.3: Rank-sum Test (T=4.5 versus other three treatments)

		rank-sum treatment 1	rank-sum treatment 2	z-value	p-value
T=1.6 versus T=4.5					
Session average	bPay2%	26	10	2.309	0.021**
	sAccept%	26	10	2.323	0.020**
	pay2Meetings2%	26	10	2.309	0.021**
	No-tradeMeetings%	10	26	-2.309	0.021**
First market	bPay2%	22.5	13.5	1.348	0.178
	sAccept%	25	11	2.097	0.036**
	pay2Meetings2%	24	12	1.764	0.078*
	No-tradeMeetings	11	25	-2.124	0.034**
T=2.8 versus T=4.5					
Session average	bPay2%	26	10	2.309	0.021**
	sAccept%	26	10	2.309	0.021**
	pay2Meetings2%	26	10	2.309	0.021**
	No-tradeMeetings%	10	26	-2.309	0.021**
First market	bPay2%	23	13	1.479	0.139
	sAccept%	19	17	0.298	0.766
	pay2Meetings2%	19.5	16.5	0.438	0.661
	No-tradeMeetings%	18	18	0.000	1.000
T=3.5 versus T=4.5					
Session average	bPay2%	25	11	2.021	0.043**
	sAccept%	26	10	2.323	0.020**
	pay2Meetings2%	26	10	2.309	0.021**
	No-tradeMeetings%	10	26	-2.309	0.021**
First market	bPay2%	16	20	-0.592	0.554
	sAccept%	16	20	1.222	0.222
	pay2Meetings2%	18	18	0.000	1.000
	No-tradeMeetings%	11.5	24.5	-1.947	0.052*

Notes. (1) Combined sample size for each test is 8. (2) *p-value≤0.1; p-value≤0.05; p-value≤0.01.

Table E.4: Test of Convergence to Symmetric Equilibrium $T = 4.5$

Session		bPay2%			sAccept%			Pay2Meetings%		
		$1-\lambda$	$100-\frac{\mu}{1-\lambda}$	$\frac{\mu}{1-\lambda}$	$1-\lambda$	$100-\frac{\mu}{1-\lambda}$	$\frac{\mu}{1-\lambda}$	$1-\lambda$	$100-\frac{\mu}{1-\lambda}$	$\frac{\mu}{1-\lambda}$
1	Coef.	0.220	87.686***	12.314	0.587***	86.772***	13.228***	0.423**	92.353***	7.647
	Std.Err.	0.139	10.495	10.495	0.211	5.569	5.569	0.194	5.711	5.711
2	Coef.	0.118	96.471***	3.529	0.253*	96.091***	3.909	0.134	103.78***	-3.778
	Std.Err.	0.099	22.867	2.867	0.152	14.602	14.602	0.137	23.643	23.643
3	Coef.	0.124	95.312***	4.688	0.651***	86.976	13.024**	0.464***	92.655***	7.345
	Std.Err.	0.081	22.428	22.428	0.152	5.130	5.130	0.121	5.246	5.246
4	Coef.	0.088	87.654***	12.346	0.689***	79.964***	20.036***	0.504***	83.644***	16.356***
	Std.Err.	0.128	40.628	40.628	0.163	0.741	0.741	0.152	4.681	4.681

Notes. (1) *p-value≤0.1; p-value≤0.05; p-value≤0.01. (2) Number of observations: 19.

Table E.5: Buyer Payment 2 Choice (%) $T = 4.5$

	(1) Stage1:bBelief(%)	(2) Stage 2:bPay2(%)
MktAcceptL(%)	**0.545*****	
	(0.053)	
bBelief(%)		**0.763*****
		(0.085)
market	**-1.536*****	**-0.623***
	(0.235)	(0.333)
location	**5.294*****	**3.920**
(SFU=1;UCI=0)	(2.204)	(2.428)

Notes. (1) *p-value≤0.1; p-value≤0.05; p-value≤0.01. (2) Each regression has 532=4x7x19 observations. There are 4 sessions, each with 7 buyers and 20 markets. For each individual, we have 19 observations as the first-stage regression uses a lagged variable as an independent variable. (3) The regressions have clustered errors at the individual subject level.

Table E.6: Seller Acceptance of Payment 2 $T = 4.5$

	(1) Stage 1:sBeliefB(%)	(2) Stage 1:sBeliefS(%)	(3) Stage 2:sAccept
sBeliefB(%)			**0.816**
			(0.665)
sBeliefS(%)			**-0.293**
			(0.923)
sAcceptL(%)	**0.089**	**4.712**	
	(10.836)	(6.207)	
sPay2DealL(%)	**0.258*****	**0.167***	
	(0.129)	(0.089)	
sNoDealL(%)	**0.378*****	**0.238*****	
	(0.094)	(0.077)	
sOtherAcceptL(%)	**0.242*****	**0.391*****	
	(0.088)	(0.095)	
market	**-1.270*****	**-1.333*****	**-0.103**
	(0.480)	(0.433)	(0.606)
location	**-0.959**	**-5.953***	**1.663**
(SFU=1;UCI=0)	(2.852)	(3.251)	(6.569)

Notes. (1) *p-value≤0.1; p-value≤0.05; p-value≤0.01. (2) Each regression has 532=4x7x19 observations. There are 4 sessions, each with 7 sellers and 20 markets. For each individual, we have 19 observations as the first-stage regression uses a lagged variable as an independent variable. (3) The regressions have clustered errors at the individual subject level. (4) For the stage-2 regression, coefficient represent the marginal effect on the probability of sellers accepting payment 2.

F Beliefs

In this Appendix, we provide some additional results regarding subjects' beliefs. Figures F.1 to F.3 show the histogram of bBelief, sBeliefB, sBeliefS at the beginning (market 1), in the middle (market 10) and at the end (market 20) to show how these beliefs evolved over time. One observation is that the initial, market 1 beliefs tend not to differ significantly across the four treatments. However, these beliefs evolve over time and become significantly different from one another in the later markets across the different treatments. Given the strong dependence of payment decisions on beliefs, the dynamic pattern of beliefs also translates into payment adoption. As pointed out in the main text, the payment adoption and use variables also started out with roughly similar initial conditions and also diverged over time.

Our experimental results suggest that sellers are more willing to adopt the new payment method than buyers when T is 1.6 and 2.8, and in the beginning of the 20 markets when T=3.5 and 4.5. Below we ask whether this can be attributed to differences between buyers' beliefs and sellers' beliefs. To investigate this question, we show in Table F.1 the average bBelief among all buyers and sBeliefB among all sellers across all 20 markets. We carry out a Kolmogorov-Smirnov (K-S) test, where the null hypothesis is that the two belief distributions follow the same cumulative density function (CDF). The last column of Table F.1 reports the p-values from this test. Table F.2 shows the results for the same exercise, but for the first market only (columns 2-4) and for the first two markets only (columns 5-7). Figures F.4-F.6 graph the CDFs of the beliefs used in these comparisons.

First, to check whether sellers are more willing to adopt the new payment method than buyers when T is not too big (i.e., when $T = 1.6$ and 2.8) and whether this can be attributed to differences in beliefs, we examine the first two rows of Table F.1. We see that that bBelief tends to be higher than sBeliefB when $T = 1.6$, while the distribution of the two belief terms is not significantly different from one other for $T = 2.8$. The experimental results that sellers are leading adoption in these two treatments therefore cannot be attributed to differences in buyer and seller beliefs.

Second, to see whether sellers are more willing to adopt the new payment method than buyers at beginning of the 20 markets when T is large, we look at table F.2. The table shows that bBelief and sBeliefB are not significantly different from one another for the first (or the first two) market(s). Again, it seems that the willingness of sellers to adopt the new payment is not driven by more optimistic beliefs, but is instead driven by the fear of losing transactions.

This result is not too surprising given that sellers face different choices than buyers. Sellers alone make a binary adoption decision; not accepting the new payment method runs the risk of losing transactions. Buyers, on the other hand, make a *portfolio* choice and they tend to split their endowment evenly between the two payment methods to test the waters in the early markets (from Table 2 and E.1, "payment choice and usage", the buyer's allocation to payment 2 in the first market is 59% when $T = 1.6$, 60% when $T = 2.8$, 49% when $T = 3.5$ and 52% when $T = 4.5$).

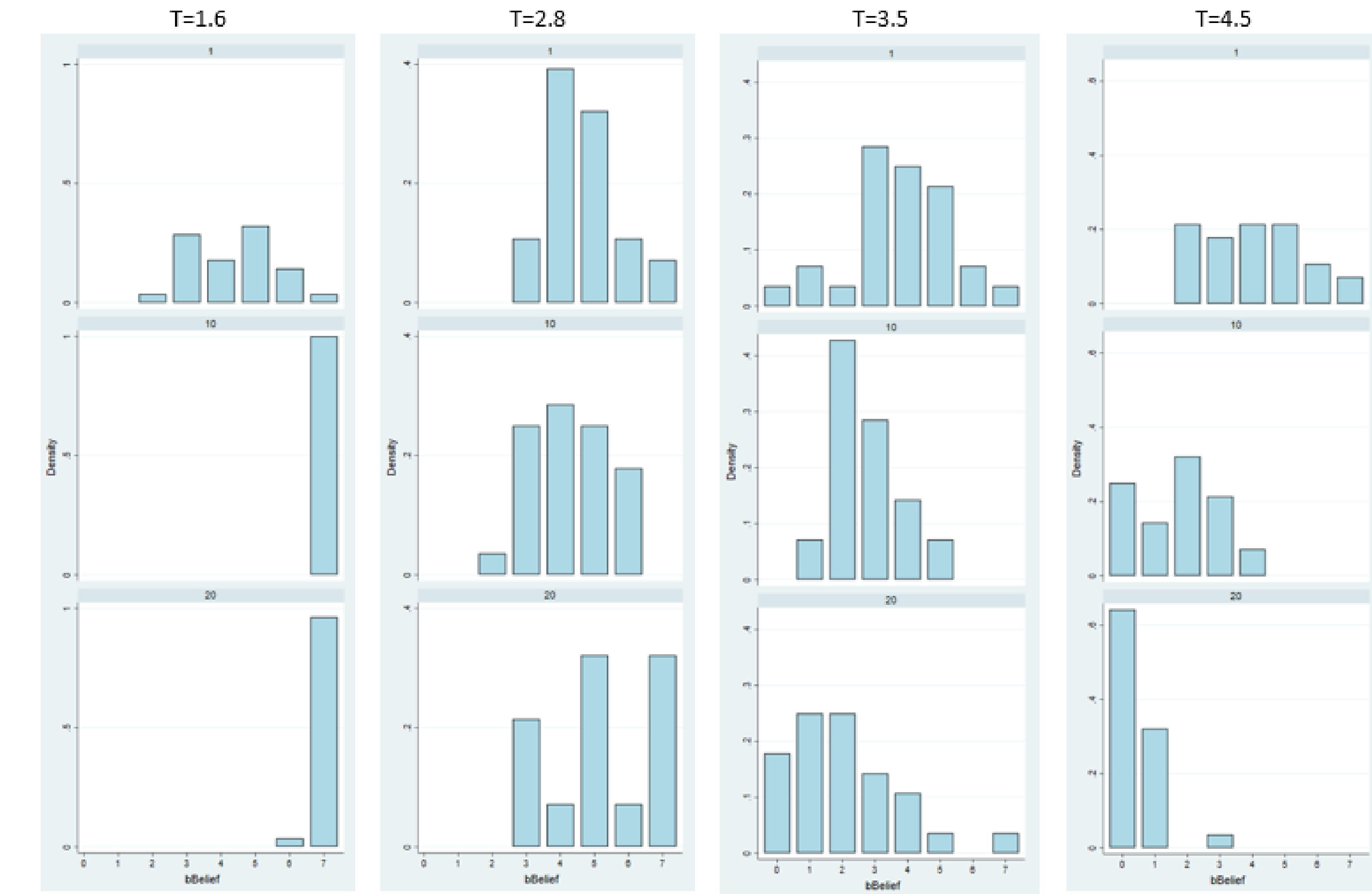


Figure F.1: Histograms of bBelief by treatment

Notes. (1) Each column in this figure represents one treatment. For each treatment, we show histograms of bBelief in market 1 (top row), market 10 (middle row) and market 20 (bottom row). (2) Each histogram shows the probability density distribution of beliefs across the 28 subjects who participated as buyers in the four sessions of the same treatment.

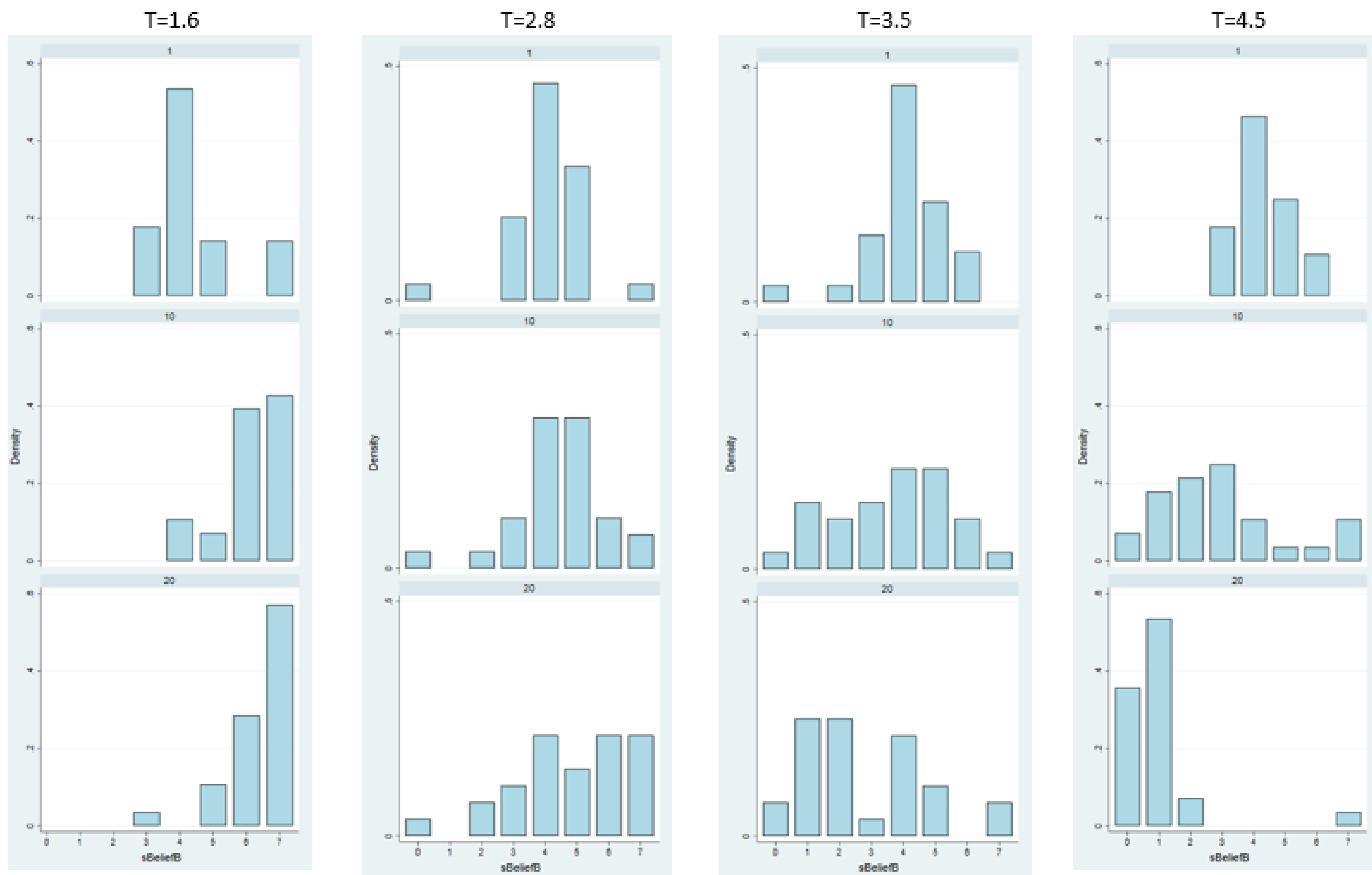


Figure F.2: Histogram of sBeliefB by treatment

Notes. (1) Each column in this figure represents one treatment. For each treatment, we show histograms of sBeliefB in market 1 (top row), market 10 (middle row) and market 20 (bottom row). (2) Each histogram shows the probability density distribution of beliefs across the 28 subjects who participated as sellers in the four sessions of the same treatment.

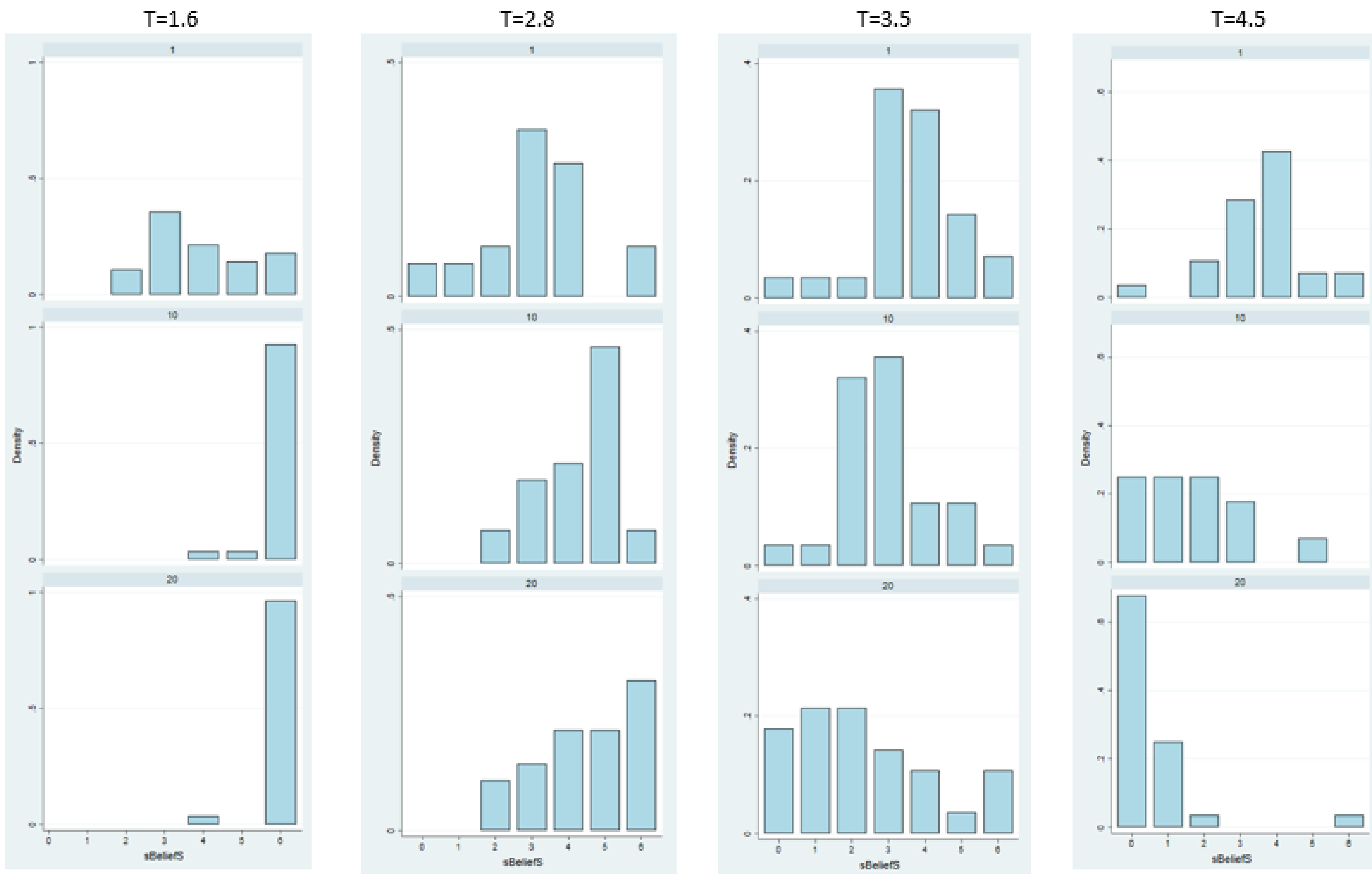


Figure F.3: Histogram of sBeliefS by treatment

Notes. (1) Each column in this figure represents one treatment. For each treatment, we show histograms of sBeliefS in market 1 (top row), market 10 (middle row) and market 20 (bottom row). (2) Each histogram shows the probability density distribution of beliefs across the 28 subjects who participated as sellers in the four sessions of the same treatment.

Table F.1: Differences in Buyer and Seller Beliefs (All Markets)

T	bBelief	sBeliefB	p-value of K-S test
1.6	6.44	5.86	0.000
2.8	4.58	4.48	0.320
3.5	3.01	3.59	0.000
4.5	1.78	2.51	0.000

Table F.2: Differences in Buyer and Seller Beliefs in Early Markets

	Market 1			Markets 1-2		
T	bBelief	sBeliefB	p-value of K-S test	bBelief	sBeliefB	p-value of K-S test
1.6	4.36	4.39	0.541	4.79	4.45	0.230
2.8	4.64	4.07	0.763	4.64	4.30	0.334
3.5	3.75	4.07	0.541	4.07	4.20	0.999
4.5	4.04	4.29	0.541	4.13	4.05	0.979

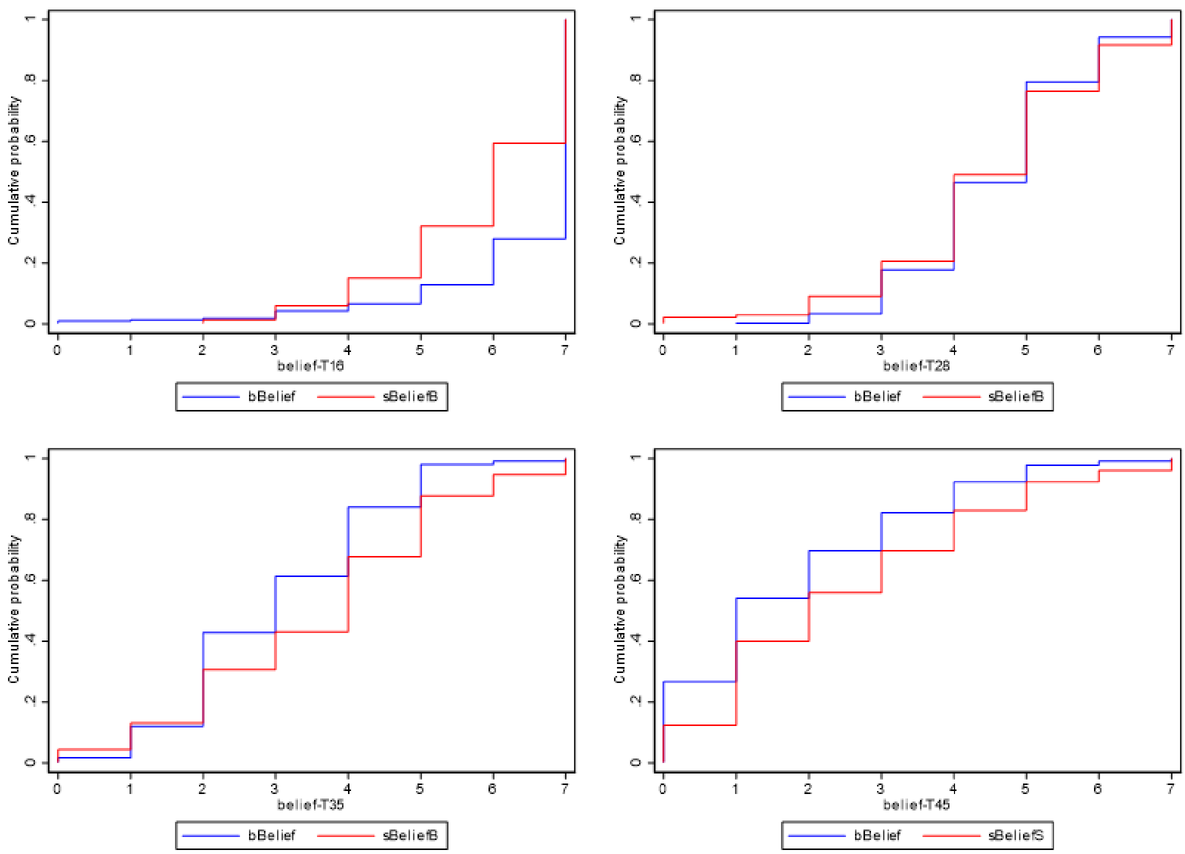


Figure F.4: Comparison of bBelief and sBeliefB (All Markets), by Treatment

Notes. (1) Each figure represents one treatment. The CDF for bBelief is in blue, and for sBeliefB is in red. Each line is the cumulative density distribution of beliefs in the 20 markets by the 28 buyers or sellers in the four sessions of the same treatment.

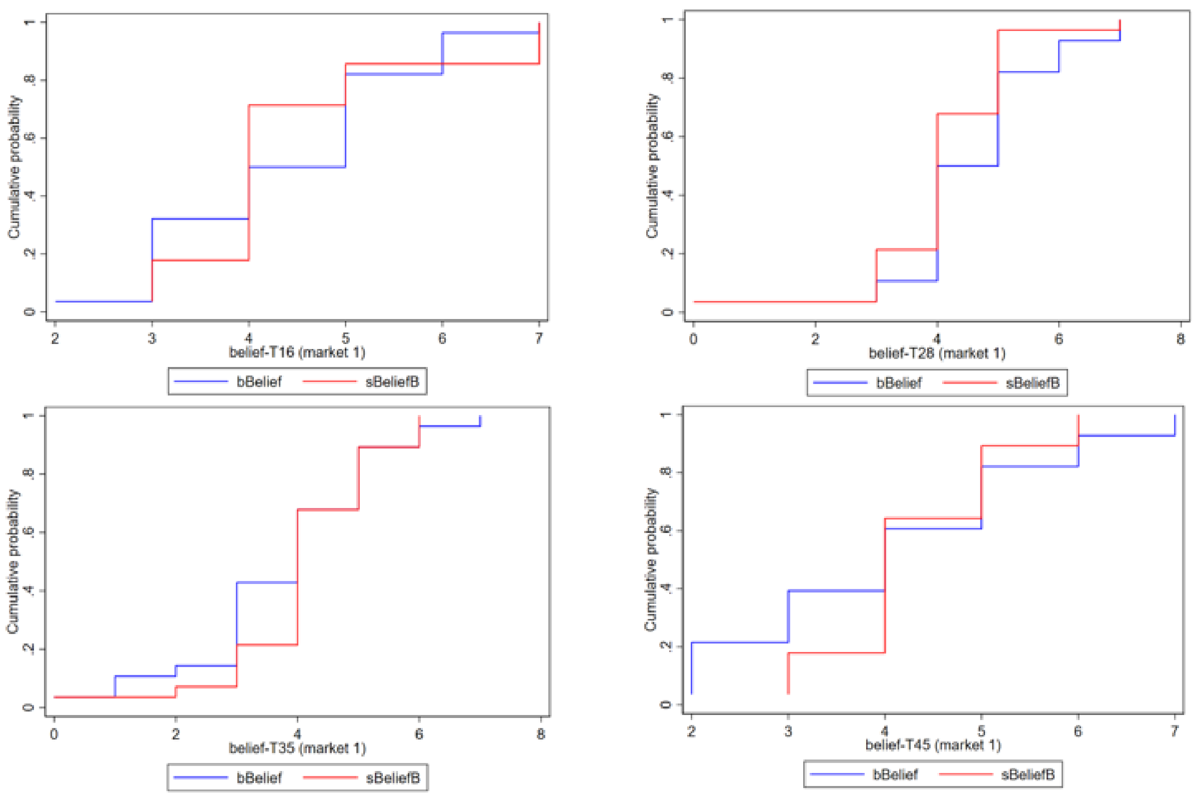


Figure F.5: Comparison of bBelief and sBeliefB (Market 1 only), by Treatment

Notes. (1) Each figure represents one treatment. The CDF for bBelief is in blue, and for sBeliefB is in red. Each line is the cumulative density distribution of beliefs in the first market by the 28 buyers or sellers in the four sessions of the same treatment.

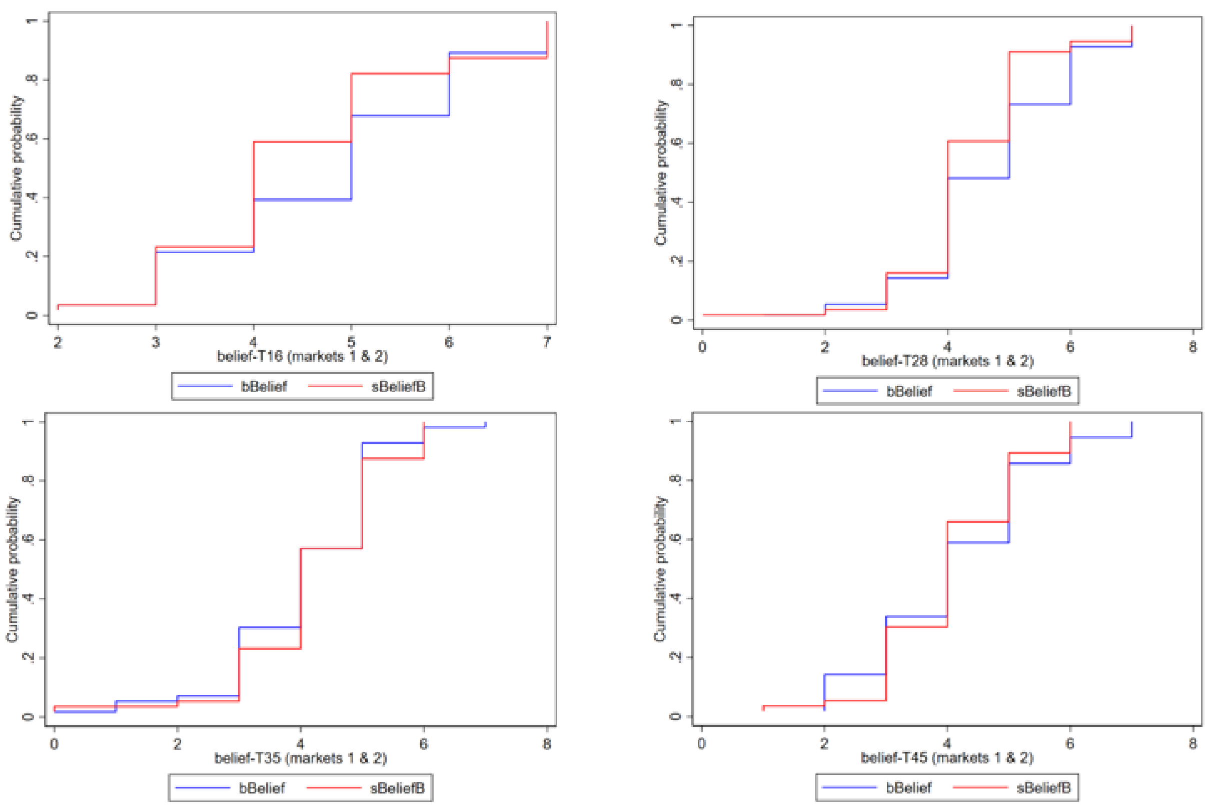


Figure F.6: Comparison of bBelief and sBeliefB (Markets 1 and 2 Only), by Treatment

Notes. (1) Each figure represents one treatment. The CDF for bBelief is in blue, and for sBeliefB is in red. Each line is the cumulative density distribution of beliefs in the first two markets by the 28 buyers or sellers in the four sessions of the same treatment.