Journal of Economic Behavior and Organization 227 (2024) 106743

Contents lists available at ScienceDirect

Journal of Economic Behavior and Organization

journal homepage: www.elsevier.com/locate/jebo

Research Paper

Opposition to markets: Experimental evidence

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ARTICLE INFO

JEL codes:
C90
D63
I14

Keywords:
Markets
Opposition
Fairness
Distribution
Risk exposure
Experiment

ABSTRACT

We experimentally investigate reasons for opposing market institutions. The experiment shows that opposition to implementing market institutions varies by background characteristics and shows that distributional concerns are a reason for opposing trade institutions. We find no evidence that the opposition to trade is due to risk preferences or paternalistic motives. A main driver of the opposition to trade is the information about background conditions: veils of uncertainty increase the support for the trade institution.

1. Introduction

Proponents of free markets often point out the efficiency benefits of free exchanges of goods and services. As nobody is forced to engage in trade, everybody could benefit. Yet, facilitating market exchanges in diverse domains is met with skepticism. Some markets face moral concerns (e.g., kidneys, jury duties, school admissions; see Roth 2007) such that third parties may want to prevent such trades. Also, there may be concerns that the trade benefits are not fairly distributed due to the lack of a level playing field (e.g., Sandel 2012, 2013, Helpman et al. 2017). As such, extant inequalities within society may make some people hesitant to trade institutions as those may implicitly accept the existing unfairness or distribute the gains from trade in a way that even increases such inequalities (Konow and Schwettmann, 2016). Furthermore, denying others trade opportunities may be seen as paternalistic if people deem the potential choices by others as problematic (e.g., Perri 2000, Parker 2004, Thaler and Sunstein 2003). This paper contributes to unpacking potential reasons for opposing market institutions.

Satz (2010) develops a framework with several parameters for evaluating whether markets are "noxious" (vulnerability, weak agency, extremely harmful outcomes for individuals, and extremely harmful outcomes for society). While weak agency can be related to having insufficient information about the goods and services when agreeing to transactions, vulnerability can be seen as a source of market exchange that is driven by poverty such that people may desperately agree to exchanges (Satz, 2010, p.100). The "noxiousness" of markets thus needs to be assessed depending on the background conditions. Harm to individuals can be connected to taking excessive risks, harm to society can be linked to markets undermining a social framework in which people interact as equals. Correspondingly, Braham and Müller (2024) characterize the Satz' framework as being constructed on ideals of relational equality (see also Scheffler 2015, Anderson 1999, Miller 1997, Schemmel 2021) and label social practices as wrong if they create or reinforce

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https://doi.org/10.1016/j.jebo.2024.106743
Received 2 February 2024; Received in revised form 4 September 2024; Accepted 12 September 2024
Available online 24 September 2024
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existing relational inequality between individuals.

This paper reports experimental evidence to better understand potential opposition to market institutions, i.e. for allowing people to trade. For this, we abstract from repugnancy concerns that relate to the specific characteristics of the good or service in question, and rather reduces the setting to the payoff dimension and thus the involved risks and distributional concerns. While we use a neutral framing, organ trade, in particular, trade in kidneys, inspires the set-up of the experiment. Trading kidneys for payment is illegal worldwide, apart from in Iran.[1] While it is obvious that persons with kidney issues would substantially benefit from a transplant, healthy donors expose themselves to risk (e.g., Lentine and Patel 2012). Currently, there is not a large income gap between donors and recipients in the US (Gill et al., 2012). Nevertheless, studies suggest that - at a given price - the poor would have larger incentives to donate and therefore, are more exposed to potential risks (Moniruzzaman, 2012; Parada-Contzen and Vásquez-Lavín, 2019) and thus potentially more vulnerable in terms of Satz (2010).[2] To illustrate this in the experiment, we vary both the initial income of players (rich/poor) as well as their condition (healthy/sick) which combined affect their potential prospects with and without trade. This setting is inspired by labor market participation where sick persons may face a risk of losing part of their income.

Typically, there is a trade-off between repugnance and efficiency. Becker and Elias (2007) point out potential benefits from the marketability of organs, while Elias et al. (2015a, 2015b, 2017) investigate the role of information on attitudes towards financial payments for organ donations. Further, Albertsen (2020) discusses trade-offs in providing incentives for becoming an organ donor and the (partly moral) acceptability of such market institutions. If trade is allowed, the market price for organs relative to the income position of an individual, determines both the willingness to donate and the access to a new organ. Yet, when trade institutions are decided upon, the actual individual background conditions, e.g., if one falls sick and needs an organ transplant, and the individual prospects from allowing trade, may not be known. As such, the overall support for trade institutions may depend on individuals' information about their future (income or health) position and their prospects from trade. Our paper relates to Elias et al. (2019), who study preferences for legalizing payments to kidney donors. They show that moral judgments matter and respondents were concerned about the fair allocation of kidneys. In particular, they find that personal views depend on whether recipients or a public agency makes the payments. While inspired by kidney trade, our paper differs from Elias et al. (2019) as we use a neutral framing, and as we focus on four explicit reasons to oppose trade: distributional concerns, risk exposure, paternalistic concerns and information on background conditions.

The modification of information on background conditions is guided by the theories on the veil of ignorance or uncertainty (e.g., Rawls 1971, Brennan and Buchanan 1985, Buchanan and Tullock 1965). Depending on the information treatment, we shade the actual place that individuals take in society, i.e., leave individuals (fully or partly) uninformed about their starting conditions as well as about who will gain most from implementing a market institution. Doing so may facilitate society agreeing on a social contract, e.g., lead to more agreement on implementing a trade institution, and thus a more liberal institution (Buchanan and Tullock, 1965): under the veil, all players benefit in expectations, while the distribution of actual gains from trade may eventually be uneven (or only accrue to subsets of players). Specifically, the worst-off individual may not be better off when trade is allowed. However, removing the veil may diminish the institution's support.

Our experimental setting allows us to exogenously vary participants' information about their type to observe how risk and distribution embodied in the background conditions impact the willingness to accept trading institutions. In the extreme case, we have a complete veil of ignorance, i.e., no knowledge about the type. The intermediate case informs participant about one dimension of their type, i.e., rich vs. poor or healthy vs. sick, respectively. Finally, the third information condition gives subjects complete information about their type. Varying the information allows observing if a player's attitude towards trading institutions depends on how much they know about their background conditions and potential gains from trade. It also allows investigating determinants of opposing trade as a commitment device to prevent oneself or others from exposing themselves to ("extreme") risk. For this, we can compare the person's attitude towards implementing the trading institution, i.e., their vote to give themselves and others the chance to trade, with their actual choice to trade after a trade institution has been implemented.

In our experiment, a share of 20 % of respondents across all treatments oppose the trade institution although it is constructed such that personal expected payoff is unaffected or improved. We find that the major reasons individuals vote against trade are the unfair distributions of gains from trade. Importantly, the opposition towards trade is partly self-serving: opposition is lower among those that benefit the most from implementing a market institution. Specifically, we find a significantly smaller opposition to trade institutions when participants are behind the veil of ignorance and do not know their income level, their (abstractly defined) health condition, and thus, how trade affects their payoff. Similarly, we find that distributing gains from trade more evenly, thus benefiting the poor to a larger extent, reduces opposition to trade among the poor.

The paper is structured as follows: Section 2 reviews related literature. Section 3 discusses the experimental design, and Section 4 presents some theory and hypotheses. We report the results in Section 5, and provide a discussion based on policy preferences in Section 6, before a final section concludes.

[1] Kidney exchange is legal in many countries, but this does not involve any payment to the donors (see, e.g., Roth and Wang 2020). Transaction mechanisms other than trade exist (see, e.g., Roth et al. 2004, Ashlagi and Roth 2012, Agarwal et al. 2019, Ashlagi and Roth 2021). Additionally, black markets exist in some countries even though kidney sales are illegal.

[2] Emamaullee et al. (2020) give a summary of existing incentive schemes. Kessler and Roth (2012) experimentally investigate different ways of managing organ waiting lists and how they may affect the incentives to register as a donor.

2. Related literature on opposition to market institutions

Before discussing our specific research setting, we provide a brief review of reasons to oppose market institutions.

One reason to oppose markets is *repugnance* against transactions of certain goods (e.g., Fiske and Tetlock 1997, McGraw and Tetlock 2005, Roth 2007, Bénabou and Tirole 2011). Repugnance is defined as "aversion towards other individuals engage in it, even if the parties directly involved benefit from the trade" (Elias et al., 2017). Introducing repugnant goods into the market may violate traditional values or religious and moral norms. For example, if such a good is considered priceless or sacred, some argue that introducing the good into the market by setting a price may *reduce the value* of the good (see, e.g., Kelman 1981, Fiske and Tetlock 1997) or *reduce the quality* of the good (Titmuss, 1970).[3] A related argument is the potential *crowding out of intrinsic or moral motivation* within market settings (e.g., Frey and Oberholzer-Gee 1997, Deci et al. 1999, Frey and Jegen 2001, Bénabou and Tirole 2003, Bolle and Otto 2010, Cappelen et al. 2017). A large literature discusses whether the *market erodes moral values* (see, e.g., Sandel 2012, Falk and Szech 2013, Bruni and Sugden 2013, Storr and Choi 2019, Ziegler et al. 2020, Bartling et al. 2023), yet does not give an unambiguous answer.[4] Further, markets may induce trade-offs between benefits from trade and moral/ideal standards (e.g., Brekke et al. 2003, Eyckmans and Kverndokk 2010).

A different motivation to oppose trade is perceived unfairness. For example, Rawls (1971) and Nozick (1974) focus on *unfair background* conditions: even if all parties materially gain from trade, the agreement they make is not necessarily just (e.g., Konow and Schwettmann 2016) and can thus lead to opposition to trade agreements (Kverndokk, 1995). Similar fairness arguments apply to the *transaction outcome* (e.g., Oosterbeek et al. 2004, Gampfer 2014, Ciccone et al. 2020), whose perceived fairness also depends on the distribution of risks (e.g., Brock et al. 2013, Konow 2000, Cappelen et al. 2013, Freundt and Lange 2017).

Opposing trade institutions also eliminates other people's opportunity to trade, and thus can be *paternalistic* (e.g., Thaler and Sunstein 2003). Ambuehl et al. (2021) provide experimental evidence for paternalistic behavior. Pedersen et al. (2014) and Krawczyk and Wozny (2017) show that individuals with more self-control are more in favor of such strong paternalism, i.e., protecting people from voluntarily engage in certain activities.

We contribute to this previous literature by investigating the riskiness of trade, distributional concerns, and the information on individual background conditions as potential determinants of opposing trade institutions.

3. Experimental design

The experiment consisted of three parts (see Appendix A for the experimental instructions). Part A elicited experimental measures of risk attitudes towards own payoff, risk attitudes towards the payoff of another randomly chosen participant, and generosity.[5] Part B of the experiment concerned acceptance of trade and is discussed in detail below. Part C surveyed socio-demographic characteristics which are used as explanatory variables.[6]

The experiment in Part B splits participants into different types based on two dimensions. The first was whether they had high or low income, and the second was whether they had an item called SEC*URITY*. Inspired by the organ trade example, owning SEC*URITY* corresponded to a person having healthy kidneys, while not owning SEC*URITY* referred to a sick person in need of a kidney.[7] Based on this, the experiment consisted of several treatment conditions for which participants were divided into groups. Each group consisted of eight participants with two of each type (High income with SEC*URITY*, High income without SEC*URITY*, Low income with SEC*URITY* and Low income without SEC*URITY*).[8] Within the experiment, these types were neutrally framed, and they can be interpreted as combinations of rich vs. poor and healthy vs. sick. We use these descriptions throughout the rest of the paper.

In Stage 1 of Part B, all participants in each group voted on whether to allow trade. Then, in Stage 2, each participant chose whether to buy or sell the item SEC*URITY* if the vote would result in allowing trade. Within each group of eight participants, each participant votes on whether to implement the trading institution or not, and a random draw decides which of the eight decisions to implement for

[3] Titmuss (1970) uses the example of a blood market. However, del Pozo (1994) and Archard (2002) find no overwhelming support for a lower quality of blood when sold in the market.

[4] A related literature considers the role of externalities for voluntary individual actions: there is substantial evidence of prosocial behavior (e.g., Bartling et al. 2015, 2019, Kirchler et al. 2015, Irlenbusch and Saxler 2020), which also may lead to less trading volumes in markets with a negative externality (Sutter et al., 2019).

[5] One of the three tasks was randomly chosen for payment. Risk attitudes are elicited based on the Eckel and Grossman (2002, 2008) ordered lottery choice task regarding the own payoff and the payoff of another randomly chosen participant, in random order. We additionally implemented a dictator game where subjects allocated 100 tokens between themselves and another participant.

[6] Part C also measured attitudes towards trade in several domains (e.g., sex, organs, carbon emissions) as well as survey measures of risk attitudes. These are reported on in a companion paper Hauge et al. (2024).

[7] We refrained from directly calling the traded good "organ" or "kidney" as this could trigger specific associations which may not be warranted by the otherwise neutrally framed and monetarily incentivized experiment. We named the item "SECURITY" as this best describes the absence of risks when owning the item. While this wording may also not have been completely innocuous, it is equal across treatments.

[8] In complementary work, Kessler and Roth (2012) experimentally investigate incentives schemes for becoming a (organ) donor. Their implementation of "failing" units B somewhat resembles our implementation of risks: players had a 20% chance of their "kidney" unit to fail which resulted in an income loss until a donor was found (otherwise income loss was permanent). Yet, their treatment of a donor (in our experiment a seller) is different: against a specific cost, individuals decide on their willingness to donate (in case of their "death") and thus provide some public good or - in return - may get priority for receiving a unit in case of their sickness.

the group.

The payoffs to the participants were guided by typical labor market participation. In the base case, high-income participants have an income of 150 tokens,[9] and low-income participants have an initial income of 50 tokens. We assume that individuals who do not own SEC*URITY*, i.e. are labeled as sick, face the risk of losing part of their income. Specifically, those with high income face an 80 % chance of losing 75 tokens, while low-income participants without SEC*URITY* have an 80 % chance of losing 45 tokens. Table 1 illustrates the resulting lotteries for the payoffs.

3.1. Treatments: variations of information

The treatments differ concerning the information subjects have about their individual type and the payoff consequences of trades. However, all treatments keep the payoff consequences fixed that arise without trading. In the first treatment dimension, we varied the information on the characteristics participants had when they voted on the implementation of the trade institution. Importantly, the exact type was revealed *before* the actual individual trade decision was made.

- ***FullInfo*:** In this treatment, all subjects knew which type they were. Instructions told whether they had high or low income and either had or did not have the item SEC*URITY*.
- ***InfoHealth*:** Participants knew whether they had SEC*URITY* or not, but they did not know whether they had high or low income. They knew that there was a 50 % probability that they had high and low income, respectively. As owning SEC*URITY* was inspired by health, we name the treatment *InfoHealth*.
- ***InfoIncome*:** Participants knew whether they had high or low income, but they did not know whether they had SEC*URITY* or not. However, they knew that there was a 50 % probability that they had SEC*URITY*. Therefore, as they received income information, we named the treatment *InfoIncome*.
- ***NoInfo*:** Here, participants did not know any of their characteristics, but they knew that there was a 25 % probability of each of the four types. This treatment thus corresponds to deciding behind a veil of ignorance.

The payoffs were the same in these four treatments; see Table 2 below. Subjects who have SEC*URITY* can sell it, but only high-income participant without SEC*URITY* can afford to buy it (in all realizations). Subjects who buy SEC*URITY* will pay a price of 15 tokens, and this will remove their risk of income loss. Participant who own SEC*URITY* can choose to sell it at 15 tokens, but this adds a 20 % probability of losing income. The potential loss is relatively higher for low-income than for high-income participants, reflecting better possibilities for health care among richer individuals. We varied the level of information about income and health to investigate whether opposition to trade depends on knowing own benefits from trade relative to those of others.

We note that the expected income of high-income participant who initially own SEC*URITY* is the same (150) regardless of whether they sell or not, while low-income participant who own SEC*URITY* gain in expected payoff if they sell (56 vs. 50 tokens). A high-income person who does not own SEC*URITY* gains in expected income when buying (135 vs. 90). In the experiment, the decision to buy the item happens *before* knowing the realization of the (potential) benefits from trade. Low-income participants therefore do not have the possibility of buying SEC*URITY* (at the price of 15), so their expected income is 14 regardless.[10] The reason why we restrict them is again to make the experiment relevant to organ trade, where sick and poor individuals have less possibilities to buy organs. Thus, inspired by the anecdotal evidence on organ trade, we chose the parameters such that trade is particularly attractive for rich participant not owning SEC*URITY* and poor participant owning the item.

3.2. Treatments: variation of payoffs

In the second treatment dimension, we varied the payoff consequence of trade, while giving all participants full information about their type at the time they vote in favor or against allowing trade. In two initial treatments, we vary trade attractiveness only for low-income types who own SEC*URITY*.

- ***HighRisk***: While keeping the expected payoff identical to the base treatment, we increase the downside risk for low-income participant who initially own and decide to sell SEC*URITY*: they have an 80 % probability that their income is 70 (55+15=70) and 20 % probability that their income is 0 (−15+15=0).
- ***LucTrade***: Trade is made more lucrative for low-income types who sell SEC*URITY* as they receive a price of 40 instead of 15 tokens. Upon selling the item, they thus face a lottery of receiving an income of 90 (50+40) with 80 % chance and 45 (5 + 40) with 20 %. For the rich types, the price is as before (15 tokens).

We designed *HighRisk* and *LucTrade* to investigate whether paternalistic or distributional concerns drive opposition towards trade. If concerns for the poor healthy who are in a position to sell SECURITY, drives opposition to trade, then opposition to trade should be larger in the *HighRisk* treatment. Likewise, if distributional concerns drives the opposition to trade, then opposition to trade among

[9] One token is worth 5 US cents.

[10] The motivation for this experimental design feature was that poor persons in reality often face credit constraints. As such, they may not be able to bear the initial expenses necessary for trade, e.g. for an organ trade, and thus cannot realize the later (potential) benefits.

Table 1
Payoffs in the base case scenario without trading.

	Initially own SEC*URITY*	Initially do not own SEC*URITY*
High income	150	80 %: 75 20 %: 150
Low income	50	80 %: 5 20 %: 50

Table 2
Payoffs in the base case scenario when trade is allowed.

	Initially own SEC*URITY*		Initially do not own SEC*URITY*	
	Sell	Don't sell	Buy	Don't buy
High income	80 %: 150 + 15 = 165 20 %: 75 + 15 = 90	150	150–15= 135	80 %: 75 20 %: 150
Low income	80 %: 50+15 = 65 20 %: 5 + 15 = 20	50		80 %: 5 20 %: 50

other types should be lower in the *LucTrade* treatment.

A final treatment eliminates risks and implements the expected payoff consequences of the base treatment both without and with trade. If risk aversion is a driving opposition to trade, opposition should be lower in this treatment.

- ***NoRisk*:** The payoff consequences are given in Table 3.

Table 4 summarizes the gains from trade in terms of expected payoff for the respective treatments and types. We note again that the treatment variations were designed such that *FullInfo, HighRisk, NoRisk* do not differ with respect to the expected payoffs and thus also do not differ with respect to the expected payoff gains. *LucTrade* makes trade more lucrative only for the poor healthy types, but leaves the payoffs of all other types unaffected. The expected payoff gains in the different information treatments reflect the uncertainty regarding a subject's eventual type conditional on the information received.

3.3. Data: coding of variables

Our two main outcomes in Part B involve the vote for or against allowing trade, and the individual decision to trade, i.e., to buy or sell the item SEC*URITY*. For the former, we define a binary variable, *oppose*, which equals 1 for participants who voted against allowing trade and otherwise 0. For the latter, we also define a binary variable (*trade*) for whether each person decides to trade, equals 1 if the participant chose to buy or sell the item, and otherwise 0.[11] Treatment variables for Part B refer to the types of the participants as well as the treatments.

We create variables based on the experimental preference measures from Part A as well as the survey responses in Part C.

The results from the dictator game in Part A are used to define a generosity measure *give*, corresponding to the *share* of tokens given in the dictator game. *RAown* refers to the risk aversion as indicated by lottery choice (1 most risk loving, …, 6 most risk averse). *RAothers* is defined equivalently for the risky choice when the outcome matters for another person. From Part C, we use control variables as *female*, university education (*eduni*), and *economics* training (all coded as dummy variables), *age*, and a variable *conservative* to measure political orientation on a scale from 1 (liberal) to 10 (conservative).[12]

3.4. Implementation of the experiment

The experiment was designed in SoSci Survey (https://www.soscisurvey.de/) and conducted on Amazon Mechanical Turk (MTurk) in December 2020. In total, there were 902 participants. Of these, 48 participants were dropped from our sample as they did not complete the experiment,[13] giving us 854 participants in our analysis sample. We chose the sample size such that we expected to have at least 40 participants in each treatment arm. For instance, in the *FullInfo* treatment, we had at least 40 participants of each type, while in the *InfoHealth* treatment, we needed at least 80 participants as health has two outcomes. The numbers of final observations are reported in Table 5.

We limited the experiment to MTurk workers from the U.S. Our sample includes participants from all states. Most participants are

[11] Note that this variable is not defined for low-income types without the item SECURITY, as they could not afford to buy the item by construction.
[12] This variable is based on the question "In political matters, people often talk about "liberal" or "conservative". How would you place your views on this scale, generally speaking?".
[13] They left before answering page 19, which contained our main outcome variable, i.e. voting on the trade institution. There is no evidence that this attrition is treatment-specific.

Table 3
The payoffs in the risk-free treatment.

	Initially own SEC*URITY*		Initially do not own SEC*URITY*	
	Sell	Don't sell/ No trade allowed	Buy	Don't buy/ No trade allowed
High income	135+15=150	150	150–15= 135	90
Low income	41+15=56	50		14

Table 4
Gains from trade in expected payoffs for the different types and treatments.

Treatment	Expected payoff gains from trade
FullInfo/HighRisk/NoRisk	Rich healthy: 0, Rich sick: 45, Poor healthy: 6, Poor sick: -
LucTrade	Rich healthy: 0, Rich sick: 45, Poor healthy: 19, Poor sick: -
InfoHealth	Healthy: 3, Sick: 22.5
InfoIncome	Rich: 22.5, Poor: 3
NoInfo	All: 12.75

Table 5
Number of observations per treatment.

	ALL	*NoInfo*	*InfoIncome*	*InfoHealth*	*FullInfo*	*HighRisk*	*LucTrade*	*NoRisk*
Total observations	854	42	81	85	161	158	163	164

from California (8.8 %), Florida (8.6 %), and New York (7.6 %). Further, we included several control questions to check whether participants understood the instructions and to avoid robot answers.

On average, participants earned 6.70 USD, while the minimum amount earned was 0.25 USD and the maximum 15 USD. In addition, all participants earned a show-up fee of 0.75 USD.

We present the summary statistics of all main control variables in Table 6. Note that the socio-economic characteristics are balanced across treatments (with minor exemptions in the *NoRisk* treatment).

4. Hypotheses

Voting against implementing the market institution restricts the choice set of the participants themselves, and the choice sets of the other participants in the same group. Thus, if trade is voluntary and when disregarding commitment problems for the player and concerns for choices made by others, trade can leave personal utility unaffected or better off (in expectation), see also Table 4. We should expect risk neutral participants to always vote in favor of trade if they are only concerned with their own payoff.

Yet the gains from trade are unequally distributed and depend on the player type. In expected payoff terms, the rich sick person benefits more from buying than the poor healthy type from selling. Poor sick types cannot afford to buy and their expected payoff remains unaffected by trade as does the payoff of rich sellers. Implementing trade thus increases inequality (in expected payoffs) which may provide a reason for voting against allowing trade (e.g., Satz 2010, Fehr and Schmidt 1999, Bolton and Ockenfels 2000, Charness and Rabin 2002, Brock et al. 2013). Specifically, poor sick types have a larger incentive to vote against the trade institution if concerned about inequality.[14] Relative to *FullInfo, HighRisk* and *NoRisk*, treatment *LucTrade* generates larger gains from trade for the poor healthy type such that the opposition to trade due to distributional concerns may generally be lower.

A second possible reason to oppose trade is risk aversion. Risk-aversion with respect to own income or resulting inequality may affect subjects' attitudes towards trade: risk aversion increases the benefits from trade for a buyer (who can reduce her risk exposure), yet lowers the benefits for the seller (who exposes herself to risk through trade). Thus, the benefits from trade further shift towards the rich sick type and away from the poor healthy. Thus, poor persons may show more resistance to trade as both the own low income and the potentially increased inequality may matter more for risk-averse subjects relative to a risk-neutral assessment. Moreover, this logic may spill over to other player types: they may also be less inclined to allow trade if they are concerned with poor healthy players exposing themselves to downside risk when selling the item (and thus with increasing the likelihood of relatively low payoffs to a

[14] If subjects are inequality averse (e.g., Fehr and Schmidt 1999), they may be hesitant to generate increased inequality. Yet, rich healthy would be predicted to vote in favor of trade as this reduces inequality from their perspective within a Fehr-Schmidt (1999) framework. In contrast, the poor sick will go against trade as inequality increases. Poor healthy people may vote against trade if they are concerned about disadvantageous inequality as the rich sick benefit more. There is a trade-off for the rich sick: they materially benefit and move closer to the rich healthy, yet inequality against both poor types increase. However, within the Fehr-Schmidt model, benefits outweigh the increased inequality such that they can be expected to vote in favor of trade. Yet, even a rich healthy person may want to vote against trade in the risk treatments: they might want to deny the other rich healthy person to potentially become richer when trading (with 80% chance of high payoff plus the price).

Table 6
Summary statistics of control variables.

	(1) ALL	(2) *NoInfo*	(3) *InfoIncome*	(4) *InfoHealth*	(5) *FullInfo*	(6) *HighRisk*	(7) *LucTrade*	(8) *NoRisk*
	mean	mean	mean	mean	mean	mean	mean	mean
VARIABLES	(sd)	(sd)	(sd)	(sd)	(sd)	(sd)	(sd)	(sd)
age	40.07	36.62	40.47	42.25	38.75	39.90	39.49	41.72
	(11.75)	(10.69)	(11.49)	(12.59)	(10.64)	(10.52)	(11.88)	(13.36)
female	0.45	0.40	0.41	0.49	0.46	0.46	0.43	0.47
	(0.50)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
eduni	0.64	0.62	0.70	0.60	0.57	0.71	0.64	0.64
	(0.48)	(0.49)	(0.46)	(0.49)	(0.50)	(0.45)	(0.48)	(0.48)
econ	0.52	0.60	0.57	0.52	0.45	0.52	0.57	0.51
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
conservative	5.69	5.45	5.75	5.75	5.76	5.88	5.56	5.59
	(2.92)	(3.14)	(3.04)	(2.99)	(2.86)	(2.77)	(3.03)	(2.91)
RAown	4.29	3.90	3.84	4.51	4.29	4.31	4.29	4.48
	(1.78)	(1.92)	(1.90)	(1.77)	(1.76)	(1.75)	(1.77)	(1.70)
RAothers	4.41	3.71	4.16	4.89	4.41	4.60	4.36	4.34
	(1.80)	(1.98)	(1.92)	(1.57)	(1.83)	(1.69)	(1.81)	(1.80)
give	0.38	0.40	0.38	0.38	0.41	0.38	0.36	0.37
	(0.25)	(0.22)	(0.28)	(0.27)	(0.27)	(0.25)	(0.24)	(0.25)
Observations*	840	42	79	81	160	156	160	163

* based on those participants for whom all variables are defined, i.e. who fully completed the survey, the numbers thus deviate slightly from Table 5.

member of society). Thus, anticipating that both inequality aversion and risk-aversion drive the opposition to trade and consistent with Satz (2010) ideas on markets potentially undermining a social framework in which people interact as equals, we expect the resistance towards trade to be lower in *NoRisk* than in *FullInfo* where downside risks exist.

Voting against trade denies others the opportunity to trade. Opposition to trade is thus inherently paternalistic and motivated by preferences beyond a subject's own payoff. While *HighRisk* and *LucTrade* change the payoff structure only for the poor healthy, they may therefore change the support for trade also among other player types: the lucrative trade treatment should increase the support for trade relative to the baseline treatment, while the high-risk treatment can be expected to lower the acceptance rates.

So far, we discussed treatments in which subjects had information on their characteristics. Motivated by veil of ignorance or veil of uncertainty arguments for the support of social institutions (e.g., Rawls 1971, Brennan and Buchanan 1985), varying the information subjects' have about their characteristics may also change the support for trade. On one hand, subjects do not exactly know to what extent they and others benefit from implementing the trade institution. On the other hand, perceptions of what is considered fair may depend on one's position (e.g., Konow 2000, Lange et al. 2007, 2010, Brick and Visser 2015, Bartling et al. 2020). With no information (complete veil of ignorance), one may thus predict that people behave more morally by taking more social responsibility than when they know their type.[15] If the concerns with the market institution thus primarily address its tendency to reinforce existing inequalities, one may expect more opposition to trade in the *NoInfo* treatment than under partial or full information. That is, in terms of Rawls (1971), the individual with the lowest income (poor sick) is not better off under the market institution, which may lead to diminished support.

In contrast, a partial or full veil of uncertainty leaves subjects unsure if they themselves may benefit from trade. That is, in expected payoff terms, all subjects anticipate to gain under the trade institution (see Table 4, *InfoHealth, InfoIncome, NoInfo*). If these potential payoff gains govern the support of trade institutions, the competing hypothesis of more opposition to trade in the *FullInfo* treatment than in *NoInfo* or under partial information can be motivated. This prediction is in line with a veil of uncertainty leading to a larger support for more classical-liberal institutions (Brennan and Buchanan, 1985; Buchanan and Tullock, 1965).

We summarize these considerations in the following hypotheses:

H1 (Background conditions). *The proportion who vote against trade will vary based on their background conditions.*

H2a (Information). *The proportion who votes against trade will be higher when there is no information about background conditions than when such information is available.*

H2b (Information). *The proportion who votes against trade will be higher in FullInfo than when there is no or only partial information about background conditions.*

H3 (Paternalistic motives). *The proportions of rich healthy, rich sick and poor sick who vote against trade will be lower in LucTrade than in FullInfo.*

[15] Schildberg-Hörisch (2010) finds that risk aversion matters for the choices under the veil of ignorance and that Rawlsian maximin preferences are supported if social preferences for equality are sufficiently strong. Frignani and Ponti (2012) find that risk aversion is the driving factor under the veil of ignorance and not inequality aversion.

H4 (Paternalistic motives). *The proportions of rich healthy, rich sick and poor sick who vote against trade will be higher in HighRisk than in FullInfo.*

H5 (Risk aversion). *The proportion who votes against trade will be lower in NoRisk than FullInfo.*

So far, we have discussed potential reasons for opposing the trade institution. We now consider the actual decision to trade if trading is permitted. It is possible to vote in favor of trade yet choose not to trade. By construction, this might be the case of poor sick, but also for poor healthy types. More interesting is the opposite case of voting against trade yet deciding to trade. Such behavior can naturally be motivated through inequality-aversion: at the trade decision stage, subjects must take the decisions of others as given, while through opposing market institutions in the voting stage, they would also affect the choices of the other subjects. For example, a poor healthy type in the *NoRisk* treatment may oppose trade to avoid increased inequality, yet would decide to sell (and gain 6) in Stage 2 if trade is allowed, as she cannot affect overall inequality. Similarly, a rich person concerned about the poor healthy exposing themselves to downside risks, may vote against trade, yet trade herself in Stage 2 as she can no longer prevent the poor from making such a choice. However, the initial vote may spill over to the actual trade decision if preferences incorporate cognitive dissonance (Akerlof and Dickens, 1982; Mullainathan and Washington, 2009), such that participants desire some self-consistency.

5. Results

We consider the opposition towards implementing a market institution in a first step, before studying whether or not trade actually would occur if implemented. We report the shares of subjects opposing the trade institution in the respective treatments in Table 7. When comparing the opposition to trade between different treatments or types, we report results based on two-sided tests of proportions.[16]

Across all participants in all treatments, 20 % voted against implementing the market institution (see Table 7). However, the opposition varies across treatments and conditions. We first discuss the impact of background conditions (focusing on *FullInfo*), before reporting the results for the different information treatments. We then discuss the impact of paternalistic motives.

5.1. The role of background conditions

Using our main treatment *FullInfo* where participants had full information about their income level and health condition, we can compare the opposition across different background characteristics. Table 7 reports the shares voting against trade by the information that they have on their type. We observe that the opposition towards trade varies across types. Among rich sick participants, only 7 % oppose trade. The opposition is significantly larger for all other type characteristics as 29 % of rich healthy (comparison, $p = 0.010$), 28 % of poor healthy ($p = 0.016$), and 33 % among poor sick types ($p = 0.004$) oppose trade.

That is, knowing that one needs the item and at the same time being rich and affording to buy the item to eliminate own risks, leads people to vote in favor of trade. We thus find evidence for Hypotheses H1.

5.2. The role of information

We now compare the treatments where we vary the information provided about background conditions; *FullInfo* with *InfoHealth, InfoIncome*, and *NoInfo*, i.e. with treatments where only partial type information or no information was present at the time the trade institution was voted upon. Varying the information allows observing if a player's attitude towards trading institutions depends on their information about their background conditions and their potential gains from trade.

Across all participants, 24 % vote against trade in *FullInfo*. The opposition is similar in *InfoHealth* (26 %), and marginally smaller in *InfoIncome* (15 %, $p = 0.090$ vs. *FullInfo*) and among those who were behind a complete veil of ignorance in *NoInfo* (12 %, $p = 0.084$ vs. *FullInfo*).

Further separating this by types, we see that in *InfoIncome*, 13 % of those who knew they were rich and 17 % of those who knew they were poor opposed trade. Rich types thus behave similarly to rich sick types in *FullInfo*, i.e. they appear to focus on the large potential gains from trade (see Table 4). Overall, the opposition to trade under partial information on income is similar to the level seen under veil of ignorance in *NoInfo*.

In *InfoHealth,* the opposition is 30 % among those who knew they are healthy and 21 % among those who knew they are sick, in line with sick having a larger expected gain from trade. The opposition towards trade is significantly larger for healthy types than under the veil of ignorance ($p = 0.039$, 12% vs. 30 %), consistent with healthy types in *InfoHealth* having a smaller expected payoff gain from trade (see Table 4). Consistent with the logic of expected payoff gains governing the support for the trade institution, we find that a larger share of the rich and healthy (29% vs. 12 %, $p = 0.050$), the poor and healthy (28% vs. 12 %, $p = 0.075$) and the poor and sick (33% vs. 12 %, $p = 0.021$) are opposed to trade in *FullInfo* than under the veil of ignorance in *NoInfo*, while the rich and sick show similar opposition (7% vs. 12 %, $p = 0.479$).

The veil of ignorance thus makes all subjects behave similar to the rich sick type under full information, i.e., as the type who benefits most from the trade institution. This suggests that individuals behind the veil of ignorance focus on the largest potential

[16] The results are largely robust to using Mann Whitney rank sum tests instead.

Table 7
Share of participants voting against allowing trade, by types and treatment.

	ALL	Rich healthy	Rich sick	Poor healthy	Poor sick	Rich	Poor	Healthy	Sick	N
Treatment										
NoInfo	0.12									42
InfoIncome	0.15					0.13	0.17			81
InfoHealth	0.26							0.30	0.21	85
FullInfo	0.24	0.29	0.07	0.28	0.33	0.18	0.30	0.28	0.20	161
HighRisk	0.23	0.26	0.17	0.26	0.26	0.21	0.26	0.26	0.21	158
LucTrade	0.16	0.19	0.13	0.10	0.22	0.16	0.16	0.14	0.17	163
NoRisk	0.20	0.20	0.12	0.27	0.21	0.16	0.24	0.23	0.17	164
All treatments	0.20									854

individual gains from trade that they might experience, rather than focusing on potential behavioral motives that could lead to opposing trade institutions. Conversely, the increased opposition to trade once their types is revealed indicates that the distribution of gains from implementing a trading institution matters.

We can summarize our results regarding information as follows: (i) information about type does matter for opposition towards trade: the more certain individuals are that they themselves will have no or only small benefits from trade, the more likely they are to oppose trade. (ii) providing information increases opposition relative to the case of veil of ignorance in contrast to hypotheses H2a, thus lending support to the competing hypothesis H2b.

5.3. Paternalistic reasons for opposing trade

We finally have a closer look at the treatments that change the payoff structure for the poor healthy types. If paternalism and protecting the weak motivates opposition to trade, changing the payoff structure of the poor healthy types could change the opposition. If, on the other hand, participants were only concerned with their own potential benefits from trade, modifying the payoffs for poor healthy types should not make any difference for the support of trading institutions by other types than the poor healthy types themselves. Indeed, when trading is more lucrative for poor healthy types (*LucTrade* vs. *FullInfo*), opposition among the poor healthy types is lower (28% vs. 10 %, $p = 0.040$), while the opposition by other types declines only insignificantly. When trade is riskier for poor healthy types (*HighRisk*) the voting patterns are not affected for any of the specific types. Eliminating the riskiness in payoffs (*NoRisk*), again leaves the opposition to trade unaffected for all types. The downside risk that poor healthy are exposed to when selling SEC*URITY* thus appears not to be a major driver for opposing trade institutions.

In summary, as only the poor healthy types themselves change their voting patterns due to changes in the payoff structure of the poor healthy types, and not the other types, we find no support that paternalistic concerns drive the opposition towards trade. We thus do not find support for hypotheses H3 or H4.

5.4. Final trade decision

Table 8 reports the average share of participants who trade, separated by treatment and type characteristics. Across all treatments, rich sick (83 %) trade significantly more than both rich healthy (49 %) and the poor healthy (57 %) ($p = 0.000$). The large number of rich sick who trade is consistent with a desire to eliminate risk. However, the relatively large fraction of rich healthy types who trade is surprising as it exposes them to risk (keeping the expected value the same). The poor healthy expose themselves to risks, but gain in expected value. Making trade more attractive in *LucTrade*, increases their likelihood to trade (75% vs. 42 %, $p = 0.002$). Yet, they do not react to increasing risks in *HighRisk* (54% vs. 42 %, $p = 0.313$).

Actual trading correlates positively and significantly with the initial vote to allow the trading institution. Across all treatments and types, 71 % of those who favor trade institutions do trade. In comparison, only 29 % of those who voted against the trade institution traded (excluding poor sick types who cannot trade by definition). We compare the actual trading decision across the various information treatments as these implement identical payoff consequences and also have subjects fully informed about their type before they make their personal trade decision. Hence, the incentive to trade is identical at this stage such that any treatment differences in actual

Table 8
Share of participants who trade, by type and treatment.

	All types	Rich healthy	Rich sick	Poor healthy	Poor sick
NoInfo	0.59	0.55	1.00	0.27	.
InfoIncome	0.60	0.63	0.75	0.43	.
InfoHealth	0.63	0.45	0.85	0.62	.
FullInfo	0.57	0.39	0.90	0.42	.
HighRisk	0.61	0.51	0.76	0.54	.
LucTrade	0.67	0.49	0.77	0.76	.
NoRisk	0.68	0.50	0.88	0.66	.
All treatments	0.63	0.49	0.83	0.57	.

trade would conflict with consequentialist preferences. However, suppose (some) participants desire to be consistent in their choices, e.g., not to trade after having opposed the trade institution in the voting stage. In that case, we may expect the different voting decisions to spill over to the actual decision to trade.

Table 8 reveals that, for example, 62 % of the poor healthy types in the *InfoHealth* treatment trade (i.e., sell), while only 27 % of the poor healthy in the *NoInfo* treatment trade ($p = 0.063$). In addition, 63 % of the rich healthy types in the *InfoIncome* treatment trade, while this fraction is 39 % in the baseline treatment ($p = 0.081$). While these differences are only marginally significant, they are all in line with the differences in the initial vote. Our results thus suggest that different information at the voting stage may not only affect the opposition in implementing a trading regime, it may also have an effect on the eventual decision to trade and thus has efficiency implications.

5.5. Exploring correlates of voting and trading decisions

We now turn to analyzing how sociodemographic characteristics and risk attitudes correlate with opposition to trade and the actual trade decision. Table 9 reports results from series of regressions with different sets of controls. In all columns, we again see the results on difference in the opposition to trade between treatments as discussed further above. We also see that older people as well as females tend to be more opposed to trade, while conservatives are more in favor of trade institutions.

Those who are more generous in the dictator game (*give*) are less likely to oppose the trading institution, possibly because they are less concerned with other gaining more than they themselves gain through potential trades. The risk aversion measures (*RAown, RAothers*) do not have any bite in explaining the opposition to allowing for trade. This provides additional suggestive evidence that distributional concerns matter more for the opposition to trade than the exposure to risks or risk attitudes.

According to Table 10, the decision to trade correlates positively with *give*. Yet, this effect turns insignificant once controlling for the initial voting decision. Having a university education leads to a larger propensity to trade.

In Appendix B, Tables B.1 (for rich/healthy), B.2 (for rich/sick), and B.3 (for poor/healthy) report the corresponding regressions separated by types. Here, we observe that the poor healthy types largely drive the university education effect. In contrast, the give indicator only correlates with the trade decision for rich healthy types. For neither type do the risk aversion measures explain the decision to trade. We can thus conclude that the socio-demographic variables do not have much power in explaining the actual trade

Table 9
OLS regressions explaining the opposition to trade. Note that we normalized the variables age and conservative to facilitate the exposition.

VARIABLES	(1) oppose	(2) oppose	(3) oppose	(4) oppose
NoInfo	−0.12*	−0.11*	−0.12*	−0.12*
	(−1.77)	(−1.65)	(−1.72)	(−1.73)
InfoIncome	−0.09*	−0.09*	−0.10*	−0.10*
	(−1.72)	(−1.66)	(−1.86)	(−1.81)
InfoHealth	0.02	−0.01	−0.02	−0.02
	(0.31)	(−0.13)	(−0.33)	(−0.31)
HighRisk	−0.01	−0.01	−0.02	−0.02
	(−0.18)	(−0.31)	(−0.51)	(−0.49)
LucTrade	−0.08*	−0.08*	−0.10**	−0.10**
	(−1.85)	(−1.81)	(−2.15)	(−2.16)
NoRisk	−0.04	−0.05	−0.06	−0.07
	(−0.92)	(−1.16)	(−1.43)	(−1.48)
age/100		0.30**	0.36***	0.37***
		(2.53)	(3.06)	(3.11)
female		0.05*	0.05*	0.05*
		(1.74)	(1.95)	(1.88)
uni		0.01	0.00	0.01
		(0.26)	(0.14)	(0.18)
econ		−0.04	−0.03	−0.03
		(−1.21)	(−0.87)	(−0.90)
conservative/10		−0.12**	−0.12**	−0.12**
		(−2.49)	(−2.39)	(−2.39)
give/100			−0.22***	−0.23***
			(−4.10)	(−4.13)
RAown				0.01
				(1.07)
RAothers				−0.01
				(−0.80)
Constant	0.24***	0.19***	0.25***	0.24***
	(7.64)	(2.89)	(3.77)	(3.19)
Observations	854	841	841	841
R-squared	0.01	0.03	0.05	0.05

t-statistics in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 10
OLS regressions explaining the actual decision to trade. Note that we normalized the variable age and conservative to facilitate the exposition.

VARIABLES	(1) trade	(2) trade	(3) trade	(4) trade	(5) trade
NoInfo	0.02	0.01	0.01	0.00	−0.03
	(0.21)	(0.07)	(0.08)	(0.04)	(−0.28)
InfoIncome	0.03	0.00	0.01	0.01	−0.04
	(0.34)	(0.00)	(0.12)	(0.07)	(−0.49)
InfoHealth	0.06	0.04	0.05	0.05	0.06
	(0.81)	(0.54)	(0.65)	(0.65)	(0.88)
HighRisk	0.04	0.02	0.02	0.02	0.02
	(0.58)	(0.27)	(0.38)	(0.36)	(0.37)
LucTrade	0.10	0.08	0.09	0.09	0.06
	(1.54)	(1.36)	(1.48)	(1.47)	(0.99)
NoRisk	0.11*	0.10*	0.11*	0.11*	0.10
	(1.72)	(1.68)	(1.81)	(1.83)	(1.65)
age/100		−0.21	−0.26	−0.27	−0.12
		(−1.28)	(−1.56)	(−1.58)	(−0.73)
female		−0.03	−0.03	−0.03	−0.00
		(−0.79)	(−0.88)	(−0.75)	(−0.10)
uni		0.09**	0.10**	0.10**	0.11***
		(2.19)	(2.33)	(2.31)	(2.86)
econ		0.01	−0.00	−0.00	−0.01
		(0.15)	(−0.03)	(−0.04)	(−0.26)
conservative/10		0.10	0.09	0.09	0.03
		(1.38)	(1.27)	(1.28)	(0.46)
give			0.19**	0.19**	0.10
			(2.47)	(2.53)	(1.31)
RAown				−0.01	−0.01
				(−0.72)	(−0.46)
RAothers				−0.00	0.00
				(−0.02)	(0.22)
oppose					−0.43***
					(−8.96)
Constant	0.57***	0.57***	0.51***	0.55***	0.61***
	(13.09)	(6.30)	(5.59)	(5.23)	(6.16)
Observations	638	631	631	631	631
R-squared	0.01	0.02	0.03	0.04	0.15

t-statistics in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

decision.

5.6. External validity of results

The investigations into determinants of opposition to trade was based on a rather abstract, monetarily incentivized experimental setting. One may thus wonder how the individual attitudes towards trade in this setting compare to those in "real world" contexts.

In the survey that followed the experiment, we also elicited attitudes towards trade in a diverse set of potentially repugnant dimensions (see Appendix Experimental Instructions, Part C): human body parts, sexual services, food produced in countries where a large proportion of the population suffers from hunger and malnutrition, carbon emission permits, goods produced in countries by people with very low income, and allowing for surrogate mothers. A detailed investigation of the opposition to trade in the respective dimensions is given in Hauge et al. (2024) and goes beyond the scope of this paper.

Yet, comparing the opposition to trade in our experimental setting with the individuals' attitudes towards trade in various

Table 11
Correlation between the opposition to trade in the experimental context (pooled across all treatments) and different repugnant goods and services.

	Opposition to trade in experiment	
Field dimension	Correlation coefficient	p-value
opp_body	0.053	0.126
opp_sex	0.088**	0.011
opp_CO2	0.086**	0.012
opp_poor	0.102***	0.003
opp_hunger	0.106***	0.002
opp_surrogate	0.056	0.104

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

potentially repugnant fields can shed light on the external validity of our experiment. We measure attitudes on a scale (*opp_field*: 1= trade in this good/service is morally acceptable, …, 5= morally unacceptable). Table 11 shows the respective correlation coefficients between the opposition to trade in the experimental context and the respective field dimensions. We observe positive correlation coefficients between the experimental context and all dimensions, with those regarding sexual service, carbon trade, trade with poverty- or hunger-stricken countries being highly significant. This suggests that the opposition to trade in the experiment captures actual individual attitudes towards market institutions.

6. Conclusions

This paper considered motivations for opposing market institutions beyond repugnancy. We report evidence from experimental variations that are inspired by organ trade, yet use a neutral language. We find that an average of 20 % of respondents oppose implementing a market institution in our experiment even though this limits individuals' choice options and even though trading would make respondent equally or better off in expected payoff terms. The guiding explanation for the opposition to trade is indeed that opposition is largest among those who have no or only minor (expected) gains from trade. Our findings suggest that opposition is triggered through perceived unfair distributions of gains from trade which particularly accrue to high income subjects. Voting does not respond to the riskiness of trades for others such that the opposition to trade does not appear to be driven by direct paternalistic motives. Information on the specific characteristics of an individual matters for the choice to oppose trade institutions. In particular, we find lower opposition to trade behind a veil of ignorance. That is, without knowing their income position or health status and thus their background risk and potential gains from trade, fewer subjects vote against trade. Specifically, we find that the support for trade is largest under the complete veil of ignorance. Here, all players in expectation have substantial gains from allowing for trade. Less opposition to the market institution also results when individuals are only informed about their income level, yet not about their specific health level. This latter case corresponds to the motivating example for allowing organ (kidney) trade where people typically initially do not know their health status. Similarly, with more evenly distributed gains from trade, fewer subjects vote against trade. Complementing explicit moral reasons, we thus find that distributional concerns are a driver for opposing trade institutions.

These findings suggest that the "noxiousness" of markets is linked to concerns of relational equality, which in turn links to vulnerability, weak agency, and the potential of harmful outcomes (see Satz 2010, Braham and Müller 2024). Also, this connects directly to the attitudes towards markets being affected by the information on background conditions (e.g., Rawls 1971, Brennan and Buchanan 1985, Buchanan and Tullock 1965) as all players benefit in expectations such that an informational veil can increase the institution's support.

Actual trading correlates positively and significantly with the initial vote to allow the trading institution, and thus is also impacted by initially different information on background conditions.

Based on a similar subject pool of Amazon Mechanical Turk workers from the U.S., Elias et al. (2015a, 2015b, 2017) showed that informing subjects about the economic consequences of organ shortage reduces the opposition to payments for organs. Our study complements these findings by first showing another mechanism that may generate more support for trading institutions: policies targeting the distribution of gains from trade. Second, our results on the veil of ignorance suggest that - once people are unsure to what extent they or others may benefit from trade - they may be induced to put themselves more into the shoes of others (in particular of those who may benefit most). That is, opposing trade may pose a large downside risk to oneself.

Our experiment also gives some evidence that final decisions to trade are affected by veils of uncertainty even though these information treatments have identical payoff structures. Going beyond our experimental setting, the finding indicates that policies that attempt to reduce the opposition to trade institutions may also affect the final demand for trade. We leave these procedural aspects for further research.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Funding

This research project was funded by The Research Council of Norway under the program Klimaforsk (reference 268174) and by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) under Germany's Excellence Strategy - EXC 2037 `CLICCS - Climate, Climatic Change, and Society' - project number: 390683824, contribution to the Center for Earth System Research and Sustainability (CEN) of Universität Hamburg.

Appendix A: Experimental instructions

Introduction

Thank you for participating in this experiment! The results will be used in a research project. All participants in the experiment will be paid US $0.75 for participating. Additional earnings will depend on the choices you and other participants make in the experiment, and outcomes of lotteries. The expected average earnings is US $7.5. Please read the instructions carefully, as your choices determine your payment.

The currency used will be called tokens. One token is worth 5 cents (US $0.05). Upon conclusion of the experiment by all participants, you will be informed by email about how many tokens you have earned in total, and how much money you will be paid for participating.

The experiment consists of three parts: A, B, and C. Before each part starts you will receive instructions for that part. Your payment from the experiment will be the sum of what you earn in Part A and Part B. Part C is a short survey. There will be full anonymity in the experiment. The other participants will not learn your identity, what choices you make or how much you earn. At the bottom of some pages there is a control question to make sure that you are not a robot and that you have understood the instructions or that you pay attention to the questions. For some of these questions you need to answer correctly to continue with the experiment.

Part A

Part A consists of three (3) tasks. Only one of these tasks will be paid out. There is an equal chance for each of the three tasks to be paid out, and a random draw will decide which of the three tasks will be paid out. Your choices in Part A will not influence your payoffs in Part B.

[Control question]

Task 1 Information

In this task, your task is to choose one of six lotteries. You will receive the outcome of the lottery you choose. In each lottery, there are two possible outcomes, and both outcomes will occur with equal probability (50 % probability). When you have selected your preferred lottery, a random draw will determine the outcome of the lottery. The six lotteries are presented below. There is one row for each lottery. Your task is to select your preferred lottery. Example: If you pick a row specified as "56 -or- 56″, you will receive 56 for sure. If you pick a row "4 - or- 140″, the chance that you will receive 4 is the same as the chance that you will receive 140. The earnings are in tokens.

Please choose one of the six lotteries that will determine YOUR OWN EARNINGS in tokens

56 -or- 56
48 -or- 72
40 -or- 88
32 -or- 104
24 -or- 120
4 -or- 140

[Control question]

Task 2 Information

In this task, your task is to choose one of six lotteries on behalf of another participant. This other participant, who is randomly chosen, will receive the outcome of the lottery you choose. Similarly, you will receive the outcome of the lottery chosen by another participant. In each lottery, there are two possible outcomes, and both outcomes will occur with equal probability (50 % probability). When you have selected your preferred lottery, a random draw will determine the outcome of the lottery.

Example: If you pick a row specified as "56 -or- 56″, the other participant will receive 56 for sure. If you pick "4 -or- 140″, the chance that the other participant will receive 4 is the same as the chance that the other participant will receive 140. The earnings are in tokens.

Please choose one of the six lotteries that will determine the earnings of ANOTHER PARTICIPANT

56 -or- 56
48 -or- 72
40 -or- 88
32 -or- 104
24 -or- 120
4 -or- 140

Task 3

In this task, there are two roles: Person 1, and Person 2. Person 1 receives 100 tokens. Person 1 decides how many tokens to keep for herself, and how many tokens to give to Person 2. **All participants will make a choice as Person 1.**

You will be randomly assigned a partner among all the other participants for this task. The partner will not know who you are, and you will not know who your partner is. Your partner in Task 3 will not be the same person as your partner in the previous tasks.

A random draw will decide whether you are Person 1 or Person 2. If you are selected to be Person 1, your choice will determine both your own and your partner's earnings from Task 3. If you are selected to be Person 2, your earnings in Task 3 will be determined by the choice of your partner.

How many tokens do you want to give to Person 2? (0–100)

Part B

In Part B, you are in a group consisting of 8 people: yourself and 7 others. You are in the same group throughout Part B. There are four types of people in your group. They differ with respect to the initial income and if they own or do not own an item called *Security* whose properties will be explained later. Specifically, the four types are the following:

1. High income (150 tokens) own the item "*SECURITY*"
2. High income (150 tokens) do not own "*SECURITY*"
3. Low income (50 tokens) own the item "*SECURITY*"
4. Low income (50 tokens) do not own "*SECURITY*"

[Control question]

Base case (*FullInfo*)

People, who do not own *SECURITY*, have a risk of losing some of their income.

- High income people have a 20 % chance of having an income of 150 tokens, and an 80 % chance of losing 75 tokens, giving a remaining income of 75 tokens.
- Low income people have a 20 % chance of having an income of 50 tokens and an 80 % chance of losing 45 tokens, giving a remaining income of 5 tokens.

	Initially own "*SECURITY*"	**Initially do not own "*SECURITY*"**
High income	150	80 %: 75 20 %: 150
Low income	50	80 %: 5 20 %: 50

Risk-free-all-knowing

People, who do not own *SECURITY*, will lose some of their income.

- High income people have an income of 150 tokens, and will lose 60 tokens, giving a remaining income of 90 tokens.
- Low income people have an income of 50 tokens, and will lose 36 tokens, giving a remaining income of 14 tokens.

The earnings of each of the four types are summarized in this table:

The options and possible outcomes **when trade is not possible** are summarized in this table:

	Initially own "*SECURITY*"	**Initially do not own "*SECURITY*"**
High income	150	90
Low income	50	14

Part B consists of two stages:

- Stage 1 - the Decision stage: In this stage your group decides on whether to allow for trade in the item *SECURITY*" in your group or not.
- Stage 2 - the Trade stage: In this stage you decide on whether you want to buy or sell the item.

Base-case

If trade is allowed, people can buy or sell the item "*SECURITY*" at the price of 15 tokens. All people with *SECURITY* can sell it, but only high income people without *SECURITY* can buy it. **High income people who do not own** *SECURITY* can choose to buy it. People who buy *SECURITY* will pay the price of 15 tokens and this removes the risk of losing income.

- High income: will have an income after trading of 135 (150–15=135)

People who own *SECURITY* can choose to sell it. People who sell *SECURITY* will earn the price of 15 tokens, but this adds a risk of losing income; they then have a 20 % probability of losing income.

- High income: an 80 % chance of having an income after trading of 165 (150+15=165) a 20 % chance of having an income after trading of 90 (75+15=90)
- Low income: an 80 % chance of having an income after trading of 65 (50+15=65) a 20 % chance of having an income after trading of 20 (5 + 15=20)

If trade is allowed, the earnings of each of the four types are summarized in this table

	Initially own "*SECURITY*"		**Initially do not own "*SECURITY*"**	
	Sell	Don't sell	Buy	Don't buy
High income	80 %: 150 + 15 = 165 20 %: 75 + 15 = 90	150	150 - 15 = 135	80 %: 75 20 %: 150
Low income	80 %: 50 + 15 = 65 20 %: 5 + 15 = 20	50		80 %: 5 20 %: 50

If trade is not allowed, the earnings of each of the four types will be as before

	Initially own "*SECURITY*"	**Initially do not own "*SECURITY*"**
High income	150	90
Low income	50	14

All-knowing-lucrative trade

If trade is allowed, people can buy or sell the item "*SECURITY*". All people with SEC*URITY* can sell it, but only high income people without SEC*URITY* can buy it.

High income people who do not own SEC*URITY* can choose to buy it. People who buy SEC*URITY* will pay the price of 15 tokens and this removes the risk of losing income.

- High income: will have an income after trading of 135 (150–15=135)

People who own SEC*URITY* can choose to sell it. People who sell SEC*URITY* will earn some tokens, but this adds a risk of losing income: they then have a 20 % chance of losing income. Note that people with low income will earn more by selling than people with high income.

- High income: an 80 % chance of having an income after trading of 165 (150+15=165) a 20 % chance of having an income after trading of 90 (75+15=90)
- Low income: an 80 % chance of having an income after trading of 65 (50+40=90) a 20 % chance of having an income after trading of 45 (5 + 40=45)

If trade is allowed, the earnings of each of the four types are summarized in this table

	Initially own "*SECURITY*"		**Initially do not own "*SECURITY*"**	
	Sell	Don't sell	Buy	Don't buy
High income	80 %: 150 + 15 = 165 20 %: 75 + 15 = 90	150	150 - 15 = 135	80 %: 75 20 %: 150
Low income	80 %: 50 + 40 = 90 20 %: 5 + 40 = 45	50		80 %: 5 20 %: 50

If trade is not allowed, the earnings of each of the four types will be as before.

	Initially own "*SECURITY*"	**Initially do not own "*SECURITY*"**
High income	150	80 %: 75 20 %: 150
Low income	50	80 %: 5 20 %: 50

All-knowing-high-risk-reward

Trade allows people to buy or sell the item "*SECURITY*" at the price of 15 tokens. All people with SEC*URITY* can sell it, but only high income people without SEC*URITY* can buy it.

High income people who do not own SEC*URITY* can choose to buy it. People who buy SEC*URITY* will pay the price of 15 tokens and this removes the risk of losing income.

- High income: will have an income after trading of 135 (150–15=135)

People who own SEC*URITY* can choose to sell it. People who sell SEC*URITY* will earn the price of 15 tokens, but this adds a risk of losing income; they then have a 20 % probability of losing income.

- High income: an 80 % chance of having an income after trading of 165 (150+15=165) a 20 % chance of having an income after trading of 90 (75+15=90)
- Low income: an 80 % chance of having an income after trading of 70 (55+15=70) a 20 % chance of having an income after trading of 0 (−15+15=0)

If trade is allowed, the earnings of each of the four types are summarized in this table

	Initially own "*SECURITY*"		**Initially do not own "*SECURITY*"**	
	Sell	Don't sell	Buy	Don't buy
High income	80 %: 150 + 15 = 165 20 %: 75 + 15 = 90	150	150 - 15 = 135	80 %: 75 20 %: 150
Low income	80 %: 55 + 15 = 75 20 %:15 + 15 = 0	50		80 %: 5 20 %: 50

If trade is not allowed, the earnings of each of the four types will be as before

	Initially own "*SECURITY*"	**Initially do not own "*SECURITY*"**
High income	150	90
Low income	50	14

Risk-free-all-knowing

If trade is allowed, people can buy or sell the item "*SECURITY*" at the price of 15 tokens. All people with SEC*URITY* can sell it, but only high income people without SEC*URITY* can buy it.

High income people who do not own SEC*URITY* can choose to buy it. People who buy SEC*URITY* will pay the price of 15 tokens and this removes the loss of income.

- High income: will have an income after trading of 135 (150–15=135)

People who own SEC*URITY* can choose to sell it. People who sell SEC*URITY* will earn the price of 15 tokens, but this adds a loss of income.

- High income: will have an income after trading of 150 (135+15=150)
- Low income: will have an income after trading of 56 (41+15=56)

If trade is allowed, the earnings of each of the four types are summarized in this table.

	Initially own "*SECURITY*"		**Initially do not own "*SECURITY*"**	
	Trade	Don't trade	Trade	Don't trade
High income	135 + 15 = 150	150	150 - 15 = 135	90
Low income	41 + 15 = 56	50		14

If trade is not allowed, the earnings of each of the four types will be as before

	Initially own "*SECURITY*"	**Initially do not own "*SECURITY*"**
High income	150	90
Low income	50	14

[Control question]

Stage 1

Now all 8 members of your group will make a decision on whether trading in SEC*URITY* should be allowed or not in your group. The computer will then select one of these 8 decisions, and enforce it in your group. The chance of being selected is equal for all group members.

[Control question]

(Information given to all treatments)

There will be exactly 2 participants of each characteristic in your group. All participants will face an equal chance of 25 % of having the respective characteristics: high income and owning "*SECURITY*", low income and owning "*SECURITY*", high income without "*SECURITY*", low income without "*SECURITY*"

All-knowing

In your group there are exactly 2 people of each type. You will know whether you have high or low income and whether you have SEC*URITY* or not when you decide on whether trading SEC*URITY* is allowed or not in your group.

[Info: You have high/low income. You do not have/have SEC*URITY*]

Rich-or-poor

There will be exactly 2 participants of each characteristic in your group. Participants get to know if they have high or low income. You and the other participants have a 50 % probability of owning the item "*SECURITY*".

[Info: You have high/low income]

Secure-not-secure

In your group there are exactly 2 people of each type. You will know whether you have SEC*URITY* or not, but not whether you have high or low income when you decide on whether trading SEC*URITY* is allowed or not in your group. All members of your group have a 50 % chance of having high or low income.

[INFO: You do not have/have SEC*URITY*]

Decision stage

Make your decision: Allow trade / Do not allow trade

[Reminder of payoff tables are shown here]

Stage 2

You and the other 7 participants in your group will now be informed about whether you have high or low income, and whether you own or do not own the item "*SECURITY*".

[Info You do not own the item "*SECURITY*"/ own the item "*SECURITY*" You have low/ high income]

[For the combination low income/do not own the item SEC*URITY* the following text was shown:]

Since you do not own the item "*SECURITY*" and you have low income, you cannot trade. If the randomly selected dictator in your group has decided to allow trade, what decision will you make then?

Please note that this decision is binding and matters for your payoff if trade indeed was allowed. Sell /do not sell / buy / do not buy

[Reminder of payoff tables are shown here]

Now we want to ask you some questions about what you think other participants will do. You need to choose a number between 0 and 100. If you guess correctly, within a margin of 5± of the correct answer, you will earn 5 tokens

Out of 100 people with high income who own SEC*URITY*, how many do you think will sell?

Out of 100 people with high income who do not own SEC*URITY*, how many do you think will buy?

Out of 100 people with low income who own SEC*URITY*, how many do you think will sell?

Part C

We finally want to ask you a few questions about your views on some issues and your background.

Survey

For each of the areas below, to what degree do you think it is morally acceptable or unacceptable to trade these goods/services for money? 1 means that you think trade in this good/service is morally unacceptable. 5 means that you think trade in this good/service is morally acceptable.

- Goods produced in poor countries by people with very low income
- To use surrogate mothers (a woman who becomes pregnant for the purpose of

  carrying the fetus to term for another person) to have children

- Food from countries where a large proportion of the population suffers from hunger

  and malnutrition

- Sexual services
- Emission permissions for countries (for instance CO_2-permits)
- Emission permissions for firms (for instance CO_2-permits)
- Human body parts (kidneys, etc.)

For each of the areas below, to what degree do you agree with the statements? 1 means that you disagree completely … 5 means that you agree completely

- I am generally a person who is fully prepared to take risks
- I am generally a person who is willing to impose risks on other people for my own benefit
- The state should make people's incomes equal
- Governments should tax the rich and subsidize the poor
- Select 4 to prove that you are not a robot
- People should receive state aid for unemployment
- The state should restrict the choices that people have in order to prevent them from taking extreme risks

In political matters, people talk of "liberal" and "conservative." How would you place your views on this scale, generally speaking? Liberal (1) Conservative (10)

What is your age?

In which state do you reside?

What is your gender?

What is your highest completed education?

Are you currently studying economics, or have you previously studied economics or related subjects?

Appendix B. Additional tables

Table B.1
OLS regressions explaining the actual decision to trade by A1 types, i.e. rich healthy. Note that we normalized the variable give, age and conservative to facilitate the exposition.

VARIABLES	(1) trade	(2) trade	(3) trade	(4) trade	(5) trade
NoInfo	0.16	0.16	0.16	0.18	0.10
	(0.91)	(0.94)	(0.95)	(1.02)	(0.62)
InfoIncome	0.24*	0.25*	0.23	0.23	0.19
	(1.72)	(1.77)	(1.62)	(1.58)	(1.40)
InfoHealth	0.06	0.06	0.06	0.05	0.09
	(0.48)	(0.48)	(0.45)	(0.40)	(0.71)
HighRisk	0.12	0.11	0.12	0.12	0.10
	(1.08)	(0.96)	(1.04)	(1.03)	(0.96)
LucTrade	0.10	0.10	0.08	0.08	0.04
	(0.88)	(0.84)	(0.73)	(0.71)	(0.40)
NoRisk	0.11	0.11	0.13	0.14	0.09
	(0.98)	(1.01)	(1.18)	(1.21)	(0.87)
age/100		−0.13	−0.21	−0.24	−0.18
		(−0.46)	(−0.73)	(−0.81)	(−0.65)
female		0.08	0.08	0.08	0.10
		(1.14)	(1.16)	(1.10)	(1.42)
uni		−0.02	−0.01	−0.01	−0.01
		(−0.32)	(−0.12)	(−0.18)	(−0.13)
econ		0.01	0.01	0.01	0.01
		(0.07)	(0.09)	(0.12)	(0.19)
conservative/10		0.13	0.11	0.10	0.02
		(0.97)	(0.86)	(0.78)	(0.17)
give/100			0.32**	0.33**	0.19
			(2.34)	(2.36)	(1.43)
RAown				−0.01	−0.01
				(−0.45)	(−0.55)
RAothers				0.01	0.02
				(0.54)	(0.95)
oppose					−0.43***
					(−5.36)
Constant	0.39***	0.35**	0.25	0.26	0.42**
	(4.96)	(2.26)	(1.61)	(1.44)	(2.42)
Observations	211	211	211	211	211
R-squared	0.02	0.03	0.05	0.06	0.18

t-statistics in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B.2
OLS regressions explaining the actual decision to trade by A0 types, i.e. rich sick. Note that we normalized the variable give, age and conservative to facilitate the exposition.

VARIABLES	(1) trade	(2) trade	(3) trade	(4) trade	(5) trade
NoInfo	0.10	0.09	0.09	0.08	0.09
	(0.74)	(0.66)	(0.69)	(0.56)	(0.73)
InfoIncome	−0.15	−0.16	−0.16	−0.16	−0.16
	(−1.49)	(−1.58)	(−1.50)	(−1.53)	(−1.63)
InfoHealth	−0.05	−0.08	−0.08	−0.06	−0.04
	(−0.51)	(−0.77)	(−0.68)	(−0.57)	(−0.33)
HighRisk	−0.14*	−0.15*	−0.15*	−0.15*	−0.13
	(−1.71)	(−1.79)	(−1.70)	(−1.76)	(−1.58)
LucTrade	−0.13	−0.14	−0.13	−0.13	−0.13
	(−1.59)	(−1.64)	(−1.48)	(−1.50)	(−1.51)
NoRisk	−0.02	−0.04	−0.03	−0.03	−0.03
	(−0.30)	(−0.43)	(−0.34)	(−0.36)	(−0.34)
age/100		−0.11	−0.14	−0.14	−0.05
		(−0.45)	(−0.54)	(−0.55)	(−0.22)
female		−0.05	−0.06	−0.04	−0.02
		(−0.98)	(−1.04)	(−0.77)	(−0.32)
uni		0.01	0.01	0.01	0.05
		(0.11)	(0.11)	(0.18)	(0.81)
econ		−0.02	−0.03	−0.02	−0.03
		(−0.37)	(−0.45)	(−0.42)	(−0.62)
conservative/10		−0.12	−0.12	−0.12	−0.14
		(−1.19)	(−1.24)	(−1.23)	(−1.46)
give/100			0.07	0.09	0.03
			(0.72)	(0.86)	(0.28)
RAown				−0.01	−0.01
				(−0.88)	(−0.45)
RAothers				−0.01	−0.02
				(−0.90)	(−1.23)
oppose					−0.32***
					(−3.99)
Constant	0.90***	1.05***	1.04***	1.16***	1.14***
	(15.44)	(7.67)	(7.42)	(7.37)	(7.57)
Observations	213	209	209	209	209
R-squared	0.04	0.05	0.05	0.07	0.14

t-statistics in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B.3
OLS regressions explaining the actual decision to trade by B1 types, i.e. poor healthy. Note that we normalized the variable give, age and conservative to facilitate the exposition.

VARIABLES	(1) trade	(2) trade	(3) trade	(4) trade	(5) trade
NoInfo	−0.15	−0.24	−0.25	−0.25	−0.27*
	(−0.92)	(−1.47)	(−1.52)	(−1.57)	(−1.77)
InfoIncome	0.00	−0.12	−0.10	−0.12	−0.18
	(0.03)	(−0.89)	(−0.77)	(−0.89)	(−1.42)
InfoHealth	0.19	0.10	0.10	0.09	0.06
	(1.49)	(0.75)	(0.76)	(0.69)	(0.48)
HighRisk	0.11	0.06	0.06	0.05	0.04
	(1.04)	(0.55)	(0.56)	(0.44)	(0.36)
LucTrade	0.33***	0.25**	0.25**	0.24**	0.18*
	(3.08)	(2.31)	(2.30)	(2.20)	(1.76)
NoRisk	0.23**	0.24**	0.23**	0.24**	0.23**
	(2.17)	(2.23)	(2.19)	(2.25)	(2.25)
age/100		−0.45	−0.47	−0.50*	−0.26
		(−1.57)	(−1.64)	(−1.71)	(−0.91)
female		−0.06	−0.07	−0.06	−0.05
		(−0.95)	(−1.00)	(−0.93)	(−0.83)
uni		0.20***	0.20***	0.20***	0.21***
		(2.89)	(2.92)	(2.88)	(3.24)
econ		0.06	0.06	0.06	0.05
		(0.92)	(0.80)	(0.83)	(0.69)
conservative/10		0.14	0.14	0.15	0.09
		(1.18)	(1.19)	(1.23)	(0.80)

(*continued on next page*)

Table B.3 (*continued*)

VARIABLES	(1) trade	(2) trade	(3) trade	(4) trade	(5) trade
give/100			0.13	0.16	0.10
			(0.97)	(1.14)	(0.72)
RAown				−0.02	−0.02
				(−0.99)	(−0.92)
RAothers				0.02	0.02
				(0.81)	(1.11)
oppose					−0.37***
					(−4.58)
Constant	0.43***	0.45***	0.41***	0.42**	0.44**
	(5.55)	(3.01)	(2.65)	(2.34)	(2.57)
Observations	214	211	211	211	211
R-squared	0.08	0.16	0.16	0.17	0.25

t-statistics in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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