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Kerstin Mitterbacher, Stefan Palan, Jürgen Fleiß

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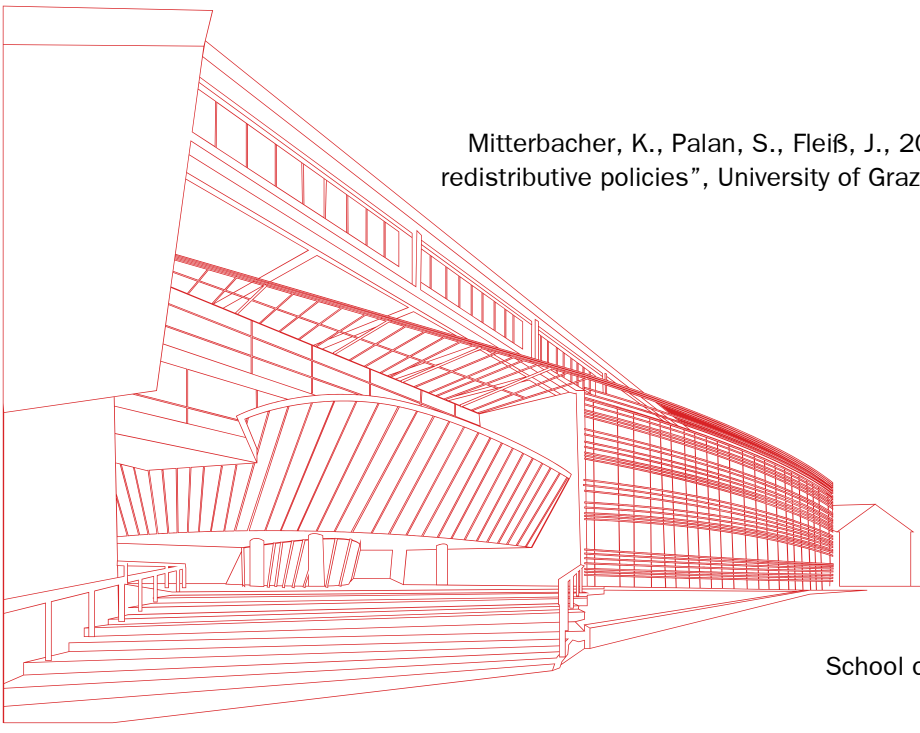

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Labor market choices of migrants and redistributive policies[☆]

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1. Introduction

Migration is one of the most pressing policy issues many countries face. More people than ever before live outside their home countries (Stroud et al., 2018). Their reasons for doing so include, among others, security concerns, persecution and poverty. Migration can serve as a key driver of development and poverty reduction in both origin and destination countries. It can benefit countries of origin in the form of remittances, of reduced unemployment, and of returned migrants transferring both skills and international contacts back home (IOM, 2017). In destination countries, migration can help sustain economic growth by providing laborers who fill both job vacancies and skill gaps, and by increasing exports and boosting innovation (Hatzigeorgiou, 2010; Ozgen et al., 2013; IOM, 2017). Yet while international institutions and economic research often tout the positive effects of migration, the

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phenomenon is regularly associated with negative public perception and other detrimental effects. Populism, xenophobia and social unrest are ascendant in many nations that are the destinations for growing numbers of migrants (UNDESA, 2017).

Especially economic migration, which refers to people leaving their respective homes to improve their economic outlook (IOM, 2011), tends to be perceived negatively (Berry et al., 2015; Crawley and Skleparis, 2018). Opponents mainly argue that economic migrants imperil the job security of natives or burden the welfare state (Ogunyemi, 2012; Kershen, 2005). Viewed from both an economic and a societal perspective, the impact of economic migration on the labor market and on the social security and welfare (hereafter SSW) system of destination countries depends on multiple factors. Besides such dimensions as the level of professional qualification, experience in specific industries, or language skills (ILO, 2017; CGD, 2018), economic migrants' contributions to the destination country are strongly determined by two factors. These are, first, economic migrants' willingness to take up work and integrate into society, and, second, the willingness of destination country citizens and policy-makers to in turn allow economic migrants to pursue formal work and integrate into society and its SSW system (Spies and Schmidt-Catran, 2017; UNDESA, 2017; Phillimore et al., 2018; World Bank Group, 2018). It is precisely this two-way and often reciprocal willingness to allow for, and to engage in, integration into the labor market and the SSW system, that lies at the core of the present paper. More precisely, we investigate how economic migrants react to (1) the possibility and subsequent implementation of redistributive policies leading to a distribution of SSW benefits that treats destination country citizens and economic migrants unequally, as opposed to (2) the possibility but subsequent non-implementation of such policies, and (3) the situation where such policies are neither being discussed nor implemented. We also show how destination countries' societies react to the labor market choices of economic migrants.

Redistributive policies targeting economic migrants are being discussed in countries all over the world. A survey of 93 countries reveals only France and Poland as offering equal social security rights to migrant and domestic workers (ILO, 2004); in terms of welfare benefits, Austria, Germany, the Netherlands, and the UK petitioned the EU Commission for the right to restrict welfare access for migrants, and now possess legal tools which they argue are intended to prevent welfare fraud (Andersen and Migali, 2016; European Commission, 2015). A case in point are Austria's indexed child benefits, under which workers with EU citizenship, yet whose children live outside of Austria, receive lower child benefits (PwC, 2021). Finally, the most recent set of policies leading to inequality between migrant and domestic workers worldwide are the COVID-19 pandemic relief policies. Under these latter policies, migrant workers are often excluded from social security benefits, wage subsidies or unemployment benefits (ILO, 2020b) and also face stricter lockdown regulations in many countries (MPI, 2021).[1]

[1]Inequality between migrant and domestic workers occurs not only between but also within countries. Wang et al. (2015) and Cheng et al. (2013) for example report that China discriminates in its handling of *hukou* (household registration), which provides urban locals with better opportunities. Thus rural migrants often choose self-employment rather than employment to avoid this discrimination (Cui et al., 2015).

These dynamic, interrelated considerations and choices by economic migrants and citizens of destination countries have not previously been explored. We take this up but abstract from many of the confounding factors that affect empirical research by resorting to a laboratory experimental approach. We thus forego a strong focus on some aspects of culture, or details of a particular legal code, in favor of being able to cleanly isolate certain behavioral regularities that drive decisions in this context.

Our study reports on an experiment about the provision of a public good in the context of economic migration. The present paper thus contributes to the body of knowledge in experimental and political economics as well as in sociology and social psychology. We provide insights into the behavior of societies faced with the possibility of migratory inflow into their respective SSW systems. We draw conclusions regarding destination countries' policies, and the impact on the behavior of both migrants and citizens present in these countries.[2]

In the remainder of this paper, section 2 presents the related literature, section 3 lays out our method, section 4 contains our hypotheses, section 5 presents the results, and section 6 concludes.

2. Related literature

Our study builds on four concepts from experimental economic research—inequality, group identity, cooperation, and punishment—and in particular in how they affect economic behavior in the provision of public goods. Behavioral research on inequality studies the effects of either inequality in the *endowment* or inequality in the *value of the public good* across participants, or both (Anderson et al., 2008). In experiments, inequality is typically operationalized as asymmetric income assigned to participants at the beginning of each period (Bagnoli and Mckee, 1991) while inequality in the value of the public good is operationalized as asymmetric payoffs earned by participants at the end of each period (Brookshire et al., 1993). Since the redistributive policies we study are framed as unequally distributed SSW benefits, we follow the latter approach. Several studies have already investigated this particular aspect, with Ledyard (1995, 2020) providing a review. Overall, these studies shows that unequal values of public goods reduce the willingness to cooperate (see, e.g., Marwell and Ames, 1979; Brookshire et al., 1993; Fisher et al., 1995; Palfrey and Rosenthal, 1991; Rapoport and Suleiman, 1993).

First, research on group identity and economic behavior is typically investigated using allocation games ('other-other' allocation tasks) and insights into participants' preferences derived from such studies help researchers understand contributions to public goods (Chen and Li, 2009). Akerlof and Kranton (2000) pioneered this field of research by demonstrating how a person's identity affects economic outcomes. Drawing on research from related fields (especially social identity theory; see Tajfel and Turner, 1979), they argue that economic outcomes depend on the group membership of both the economic actor and his or her

[2]From now on, we will use the terms 'destination country citizens' and 'citizens' interchangeably throughout this paper. The same holds for 'economic migrants' and 'migrants'.

interaction partner. Generally, research in this field shows that the value assigned to payoffs for members of one's own group is higher than the value assigned to payoffs for members of other groups.

Second, research on cooperation and economic behavior in general shows that contributions observed in public goods games start at a relatively high value and decrease over time (Ledyard, 1995, 2020). This decrease is driven by free-riders who hold on to their endowment and thus do not contribute to the public good (Hirshleifer and Rasmusen, 1989; Maier-Rigaud et al., 2010). The possibility of punishment, however, can counteract this decreasing time trend, as non-contributors can be (and do get) punished, which deters them and others from this type of behavior (Fehr and Gächter, 2000; Bochet et al., 2006; Sefton et al., 2007).

Third, research on punishment and economic behavior deals with mechanisms for promoting cooperation in public goods games. Among the various punishment mechanisms, *peer punishment*, introduced by Ostrom et al. (1994), has to date received the greatest attention (Traulsen et al., 2012). More recently, a number of studies have focused on institutional *pool punishment* (Zhang et al., 2013). In pool punishment, the act of punishment is carried out by a paid third party (e.g., a police system or a sheriff). In peer punishment, conversely, the act of punishment is carried out by peers. Traulsen et al. (2012) shows that humans prefer pool over peer punishment.

Fourth, behavioral research on economic migration is predominantly based on survey data (see, e.g., the seminal work of Borjas, 1987; the comprehensive survey of Bauer and Zimmermann, 1995; or the recent research of Brell et al., 2020). This field explores how destination country citizens perceive economic migrants, and studies the drivers of economic migration. Economic migration tends to be perceived negatively by destination country citizens (Simon and Lynch, 1999; Kessler and Freeman, 2005; Green, 2009; Blinder and Richards, 2020), although exceptions have been reported (Shahiri et al., 2020). Probing deeper, survey findings suggest that citizens of western countries support a form of conditional access of immigrants to the welfare system: citizens generally support immigrant access to the welfare system when these immigrants are integrated into the labor market, but oppose access when they are not (Larsen et al., 2018).

Thus, there is a growing body of general research on inequality, group identity, cooperation, and punishment based on controlled laboratory experiments. At the same time, there is a large body of specific research on economic migration based on survey data. Controlled experimental studies on migration, however, constitute a relatively new area but make a valuable contribution to this research field (Baláž and Williams, 2017). To date, several experimental studies have been conducted on refugees (see, e.g., the work of Dahlberg et al., 2012; Böhm et al., 2018; **?**; Jeworrek et al., 2020; El-Bialy et al., 2021) and on economic migrants (Blommaert et al., 2014; Dietz et al., 2015; Vandor and Franke, 2016; Choi et al., 2019; Walkowitz, 2019; Batista and McKenzie, 2020).[3] However, only the work of Böhm et al. (2018), Dahlberg et al. (2012) and Walkowitz (2019) is related to our present study.

[3]We label immigrants investigated in the cited studies as economic migrants since all studies focus on labor market issues, a topic closely related to economic migrants' aim of economic outlook improvement.

Böhm et al. (2018) focus on the possible exclusion of (students in the role of) refugees from the benefits of goods jointly created by (students in the role of) citizens. Most importantly for our own research questions, and in agreement with survey results, they find that the willingness to allow refugees to profit from the citizens' jointly created good depends on the refugees' level of participation in the creation of the jointly created good. Combining survey data with data on the placement of (real) refugees in Sweden, Dahlberg et al. (2012) find that the support for reducing social benefits is positively linked to the share of refugees in the population. Finally, Walkowitz (2019) find that (students in the role of) employers in a laboratory experiment pay lower 'wages' to (real) Turkish immigrants than to (real) citizens when the employees' costly effort determines the employer's income. This discrimination disappears when the effort of the employee can be controlled by the employer. Walkowitz concludes that immigrants are trusted less to choose high levels of effort than their citizen counterparts.

We extend the existing studies by an experiment focusing exclusively on the policy decisions of destination country citizens and on the contribution decisions of economic migrants. Specifically, we examine the case where citizens can change the degree to which migrants are entitled to benefit from payments from the jointly created SSW system (i.e., the public good). Our research questions are:

Research question 1) How do destination country citizens' decisions whether or not to vote for policies disadvantaging economic migrants affect these migrants' willingness to participate in the destination country's labor market?
Research question 2) How does economic migrants' willingness to participate in the destination country's labor market affect destination country citizens' decisions whether or not to vote for policies which disadvantage economic migrants?

3. Method

3.1. Setup

258 students from all fields of study participated in the experiment in the *Max-Jung-Laboratory for Experimental Economic Research* at the University of Graz, Austria, between November and December 2019, in 43 sessions with 6 students each. The average age was 24 years ($SD = 4.80$, age range: 18 to 63 years), 58 percent were female, none were of non-binary gender, and 69 percent were of Austrian nationality. We recruited our participants using ORSEE (Greiner, 2015) to ensure that everyone could only take part in the experiment once. Sessions lasted an average of 75 minutes. We paid participants in euros immediately after completion of the session, using an exchange rate from experimental points (P) to euros of 37 P = 1 EUR.[4]

Participants earned an average of 15.91 EUR ($SD = 3.82$ EUR, payment range: 4.90 to 27.10 EUR). We programmed the experiment in z-Tree (Fischbacher, 2007).

[4]This procedure follows the canonical *induced value* method of Smith (1976) by rewarding and incentivizing participants with real money for real decisions.

3.2. Experimental design

We derive our experimental design from game theoretic considerations. The model underlying the experiment is a linear public goods game implemented in a between-subjects design. We match participants randomly into groups of six and inform them that they interact only with members of their own matching group during the entire experiment (partner matching). Each matching group consists of two fixed subgroups of three participants each, formed using the over- and underestimator minimal group task of Tajfel (1970), as modified by Böhm et al. (2013): Participants see a random number of between 5 and 30 'X' symbols on their screen for a duration of 0.5s. They then estimate the number of 'X' symbols they just saw. After repeating this task five times, we sum up the individual deviations from the true numbers of symbols per participant and split the cohort into two equally-sized groups at the median score (breaking ties randomly). Böhm et al. (2013) shows that this procedure yields groups which behave similarly to each other in experiments. Moreover, members of a group feel 'closer' to other members of their own group than to members of the other group. Balliet et al. (2014) further show that studies using groups generated with the minimal group task yield comparable results to studies using natural groups. This design feature thus allows us to study the effect of group identity, which Falk and Zehnder (2013) and Böhm et al. (2021)—among others—show influences cooperative behavior in real-life (national) groups. In our setting, we can isolate the effect of group identity from confounding variables and study it under controlled laboratory conditions.

After forming the two subgroups, we privately inform participants about their respective subgroup memberships.[5] The two subgroups we form represent, as outlined in section 1, economic migrants and destination country citizens, respectively. In using these context-framed (i.e., meaningful) terms we follow Alekseev et al. (2017), who find that this helps participants better understand a setting and make more consistent decisions. We use a random draw to determine which of the two groups—the over- or the underestimator group—gets to play in the role of migrants and which in the role of citizens.

Conceptually, migrants may choose whether or not they wish to enter the formal labor market. Translated to our experiment, they can choose whether or not they wish to contribute to the SSW system. The citizens in the experiment are considered to be employed and have no choice about whether or not to contribute to the SSW system, but rather contribute automatically. Conceptually, the employer directly transfers part of the employees' wages to the SSW system (both for migrants and citizens).[6] Regardless of their employment statuses, all migrants and citizens receive benefits from the SSW system. While the amount of total benefits paid out by the SSW system depends on migrants' contribution decisions

[5]We use the post-experiment questionnaire to confirm that we have succeeded in creating a feeling of group identity among our participants. See online appendix A for details.

[6]We choose this design to (1) limit our study to the decisions of citizens who are actively employed in the labor market, and to (2) rule out such issues as tax evasion. While both the decisions of non-employed citizens and tax evasion are interesting topics in their own rights, they fall outside the scope of this study. Nevertheless, we wish to clearly state that in no way are our design choices intended to create the impression of a greater readiness for active participation in the labor market among citizens than among migrants.

(as citizens contribute automatically), the share of this total that an individual participant receives depends on the experimental treatment and the citizens' policy decisions. Table 1 provides an overview of the treatments and the associated benefits from the SSW system.

Table 1:
Benefits from the social security and welfare system

	Experimental Treatments			
Benefit distribution	EQUAL	MODERATE	EXTREME	INEFFICIENT
Subgroup	(.5|.5)	(.6|.4)	(.8|.2)	(.5|.4)
Individual migrant	$1/6$ $(.1\dot{6})$	$2/15$ $(.1\dot{3})$	$1/15$ $(.0\dot{6})$	$2/15$ $(.1\dot{3})$
Individual citizen	$1/6$ $(.1\dot{6})$	$1/5$ $(.2)$	$4/15$ $(.2\dot{6})$	$1/6$ $(.1\dot{6})$

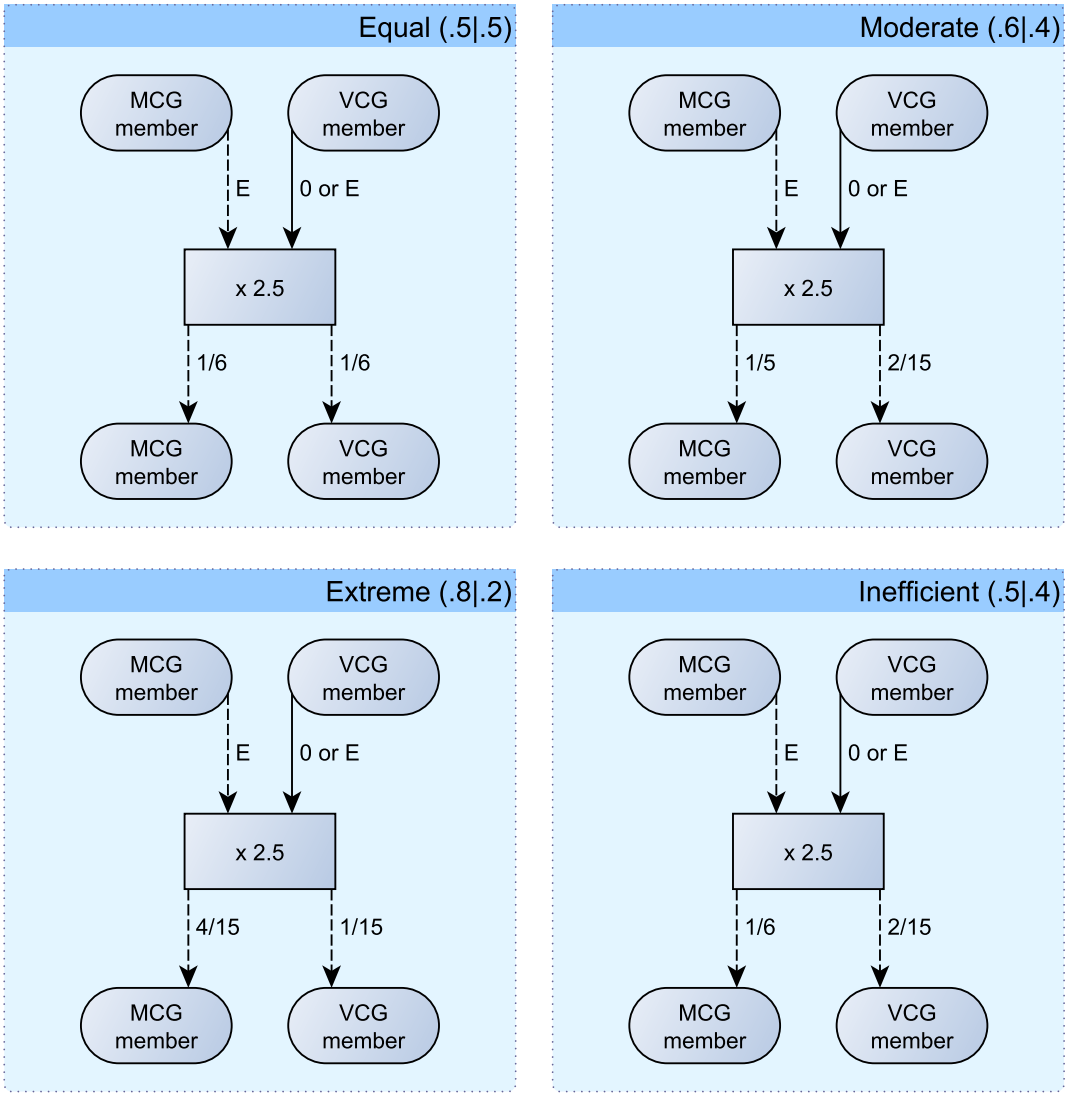
Note: In the baseline treatment (EQUAL), the share of benefits from the SSW system are equally large for migrants and citizens (.5|.5). In the three discriminatory treatments (MODERATE, EXTREME INEFFICIENT), the shares differ in the extent of inequality and efficiency loss but are the same as in EQUAL if the policy disadvantaging migrants is not implemented. Note that in EQUAL, votes are cast for hypothetical policies and are thus not payoff-relevant.

In the exposition of our experimental design, we suppress the period subscript for simplification and refer to 'citizens' as members of the Mandatory Contribution Group (MCG) and to 'migrants' as members of the Voluntary Contribution Group (VCG). Our experiment operationalizes a game-theoretic situation that can be described as follows: Independent of the treatment, each individual receives an endowment E at the beginning of each period and MCG and VCG decisions are made simultaneously. MCG members automatically contribute E to the jointly created public good (i.e., the SSW system). VCG members can decide whether or not to contribute. Their contribution decision is a binary all-or-nothing decision. Therefore, the total contributions C increase in increments of E for each VCG member who chooses to contribute to the SSW system. Conceptually, C represents contributions of labor and thus of citizens' and migrants' time and effort. Nevertheless, for experimental convenience (and in line with the largest part of the related literature) we treat C as if it were made up of monetary contributions. C is multiplied by the growth factor $F = 2.5$ to yield the total pot $P = C \cdot F$. We denote the number of MCG members by n_M and the number of VCG members by n_V, and $n_M = n_V = 3$. The number of VCG members who contribute is denoted by $n_V^+ \leq n_V$. C is a function of n_M, of n_V^+, and of each subject's endowment E in that $C = \left(n_M + n_V^+\right) \cdot E$. We denote our treatments $\theta \in \{\text{EQUAL}, \text{MODERATE}, \text{EXTREME}, \text{INEFFICIENT}\}$. The share of the total pot P that goes to MCG members is denoted by s_M^θ and the share that goes to VCG members by s_V^θ. If we assume that all VCG members contribute, then *within* each of the two groups (MCG, VCG), each participant's individual payoff (π_M, π_V) will be equally large. Specifically, it will amount to $\pi_M = {}^{s_M^\theta \cdot P}/_{n_M}$ for all MCG members and to $\pi_V = {}^{s_V^\theta \cdot P}/_{n_V}$ for all VCG members.[7]

[7]For the purpose of our experiment, EQUAL MCG members are passive participants. Thus, payoffs in EQUAL depend only on VCG members' decisions.

Following each period, we inform MCG and VCG members about each other participant's contribution and payoff. Figure 1 present the treatments of the experimental design.

Figure 1:
Experimental treatments of the study



Note: Solid edges indicate participant choices, dashed edges indicate progression without participant choice. The figure illustrates the treatments under the assumption that MCG members choose to implement unequal distribution in treatments Moderate, Extreme, and Inefficient; if they implement equal distribution, the same illustration as in Equal applies throughout.

Our treatments model inequality in the value of a public good, operationalized as asymmetric payoffs. We thus manipulate the distribution of benefits migrants and citizens receive from the SSW system. We characterize our manipulations through the level of inequality,

expressed as the percentage point difference between the payoff shares of migrants and citizens, respectively. Inequality equals 0 for EQUAL, .2 for MODERATE, .4 for EXTREME and .1 for INEFFICIENT. We thus model a situation where citizens can decide whether or not to implement a distribution policy that discriminates by disadvantaging migrants, regardless of these migrants' contribution decisions.[8] A session of the study lasts 20 periods. Each session starts with five training periods (in which all participants are already aware of the policy that will become available for implementation from period 6 onwards—if any). These training periods are intended to familiarize participants with the experimental task and to establish choice patterns which participants can condition their later choices on. They also allow for experiencing the causal effect of migrants' initial behavior on citizens' policy decisions. Starting with period 6, citizens at the beginning of each period participate in a majority vote on whether or not they wish to implement the same distribution policy as in EQUAL (*equal policy*) or, alternatively, a discriminatory distribution policy where migrants receive lower shares from the benefits of the SSW system than do citizens. In addition to unequal shares for migrants and citizens, treatment INEFFICIENT models a situation characterized by efficiency losses:[9] If citizens implement the discriminatory policy, the distribution shares are (.5|.4), implying an efficiency loss of .1 times (or 10 percent of) the total benefit. This efficiency loss can be interpreted as reflecting transaction costs for the implementation of the discriminatory policy. Citizens who vote for the discriminatory policy in this treatment thus exhibit a preference for disadvantaging migrants even in the absence of a concurrent monetary benefit to themselves.

3.3. Procedure

At the beginning of an experimental session, participants arrive and wait outside the laboratory. At the designated starting time, participants are welcomed by the experimenter, draw cards bearing their computer numbers, are led into the lab and sit down at the workstations corresponding to the numbers on their cards. They there find a copy of the laboratory rules, which the experimenter reads out loud, asking the participants to read along. The remainder of the session then consists of two parts. Part A contains the group formation task for assigning participants to the roles they then assume in Part B: migrants and citizens. After answering any possible remaining questions individually, the experimenter starts Part A. The instructions for this part are shown on participants' screens (See online appendix D.A for the instructions for Part A and Part B).

After finishing Part A, each participant is informed about whether they are an over- or underestimator. The experimenter then distributes the instructions for Part B and again reads them out loud, asking participants to read along. After answering any remaining questions individually, the experimenter starts Part B of the experiment, beginning with

[8] We use the word *discriminate* in its scientific interpretation, as a synonym of 'treat differently'. We wish to stress that we do not intend it to convey a negative value judgment, as it often does in popular discourse.

[9] The first three treatments have in common that redistribution is efficient in the sense that there are no frictions or transaction costs which reduce total SSW benefits, while matching groups face a 10 percent efficiency loss in treatment INEFFICIENT.

the comprehension questions. After all participants have correctly answered these questions, one participant rolls a die to assign the over- and underestimators to the roles of migrants and citizens. After that, the experimenter starts the main experimental task, consisting of 20 periods where, each period, migrants decide whether or not to contribute to the SSW system and citizens (starting in period 6) decide by majority vote whether they implement the equal policy or the discriminatory policy.

In treatments MODERATE, EXTREME and INEFFICIENT, the policy vote is a binary decision for either the policy of sharing the SSW benefits equally (.5|.5), or the policy of sharing the benefits unequally (.6|.4), (.8|.2) or (.5|.4). In treatment EQUAL, instead, citizens individually indicate which share (in steps of 10 percentage points) they would prefer the group of citizens to receive, with the remainder (i.e., 100 percent minus the share they choose) going to the group of migrants. However, in treatment EQUAL this citizen choice is hypothetical and does not influence actual payoffs. Instead, all participants share the SSW benefits equally.[10]

Once all decisions in a period have been entered, a results screen informs participants of every participant's respective payoff and the citizens' policy decisions in the current period (including how many out of the three citizens voted for the policy). The preceding periods' results are shown as a payoff history in each round. After the 20 periods are over, one period is randomly selected for payoff. This is again achieved by one of the participants publicly throwing a die, the result of which determines the payoff-relevant round for all participants. Following that, participants get informed about their payoffs on their screens.

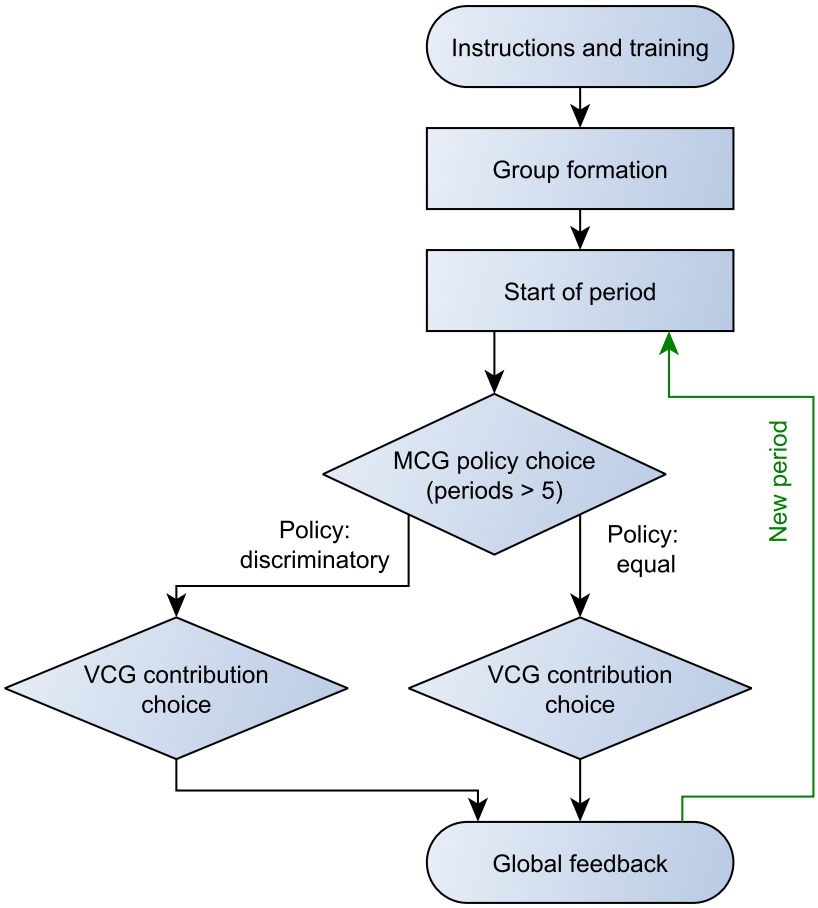
After completing the 20 periods, participants answer a computerized questionnaire eliciting data on their socio-demographic characteristics and on how they view the impact of migrants on the labor market and welfare system. The questionnaire furthermore includes a check for the success of the group manipulation task. We ask participants to wait until all participants have finished filling in the questionnaire. They then step outside the laboratory to wait until the experimenter asks participants to step back into the laboratory, one at a time, to be paid in private. Figure 2 illustrates the experimental procedures.

4. Hypotheses

We base our hypotheses on the formalization of the linear public goods game we outlined earlier. Previous studies have typically discussed two polar outcomes regarding the contributions to public goods: the *Nash Equilibrium*, i.e., zero contribution, and the *Social Optimum*, i.e., full contribution (Hichri, 2005). Rational participants with no (binding) means of coordination will not contribute to the pool, thus they all fail to increase their wealth beyond their initial endowments. The Nash equilibrium thus entails defection and yields total welfare that is low relative to the social equilibrium, where everyone contributes

[10]Treatment EQUAL allows us to observe migrants' contribution decisions in the absence of the threat of discrimination. Citizens' choices are solely intended to give the participants in the role of citizens something to do while migrants make their decisions. Of course the hypothetical nature of their choices is clearly communicated to participants in the role of citizens.

Figure 2:
Experimental procedures in the study



Note: Ovals indicate the start and the end point of the procedure, diamonds indicate participant choices, and rectangles indicate progression without participant choice. Note that MCG and VCG members make their decisions simultaneously; they interact for 20 periods.

fully. In our study, the *Social Optimum* is characterized by contributing migrants and non-discriminating citizens (i.e., citizens voting for the policy of equal distributions), and is thus defined as the greatest possible welfare migrants and citizens can collectively attain; the opposing characteristics and definition, i.e., non-contributing migrants and discriminating citizens in treatments MODERATE and EXTREME, and non-contributing migrants in treatments EQUAL and INEFFICIENT, yield the *Nash Equilibrium*.[11]

We introduce six hypotheses, the first three concerning migrants' and the other three concerning citizens' behavior. The asymmetric payoff structure, i.e., the key feature of our

[11]In terms of the Nash equilibrium, EQUAL and INEFFICIENT citizens are indifferent between discriminating and non-discriminating against migrants, since the choice does not affect their own payoffs.

experiment, forms the basis for Hypothesis 1. As the literature reviewed in section 2 shows (e.g., Marwell and Ames, 1979; Rapoport and Suleiman, 1993; Fisher et al., 1995), inequality generally tends to weaken cooperation. We thus expect migrants' average contribution rates to decline as the level of inequality that citizens can implement increases, i.e., as the shares of the SSW benefits accruing to migrants and citizens under the discriminatory policy, respectively, become potentially (more) unequal. Accordingly, we expect average contribution rates to be highest in EQUAL and lowest in EXTREME.[12] Our first hypothesis thus is:

Hypothesis 1 *The greater the level of inequality available in the discriminatory policy, the lower the probability of migrants contributing to the SSW system.*

Hypotheses 2 and 3 focus on migrants' contribution decisions and address the endogenous factors most relevant to our setting: pro-social preferences and past experience. We expect the participants in our experiment to tend towards two archetypes of behavior: on the one hand, contribution behavior that is dominated by self-interest, and on the other hand, contribution behavior that is dominated by pro-sociality. Participants with pro-social preferences are willing to increase social welfare by contributing in a public good setting (Epper et al., 2020; Chambers, 2012; Fleurbaey and Zuber, 2013). Such cooperation, however, is liable to being exploited by free-riding (Ertan et al., 2009). Cooperation is rarely unconditional. Even if migrants initially contribute, they typically cease to do so over time and as they observe other migrants failing to contribute and yet reaping higher payoffs (Fischbacher et al., 2001; Ehrhart and Keser, 1999; Keser and Van Winden, 2000). We thus predict the following steady-state outcome after some initial fluctuations: if contributing migrants are faced with non-contributing migrants, the former will become less likely to cooperate in the future; if contributing migrants are faced with other contributing migrants, they will become more likely to cooperate in the future. Taking these factors into consideration, we state our second hypothesis as follows:

Hypothesis 2 *The more other migrants contributed in the (recent) past, the higher the probability of a migrant contributing to the SSW system.*

Migrants faced with discrimination by citizens can react by contributing (e.g., in an attempt to favorably affect citizens' voting behavior in subsequent rounds) or by not contributing (e.g., out of anger, or a wish to 'punish' citizens in turn). Which of the two they choose is an open question and may be driven by traits of the individual decision-maker. Nevertheless, Houser et al. (2008) shows that the threat of punishment can lead to decreased cooperation

[12]Most of the literature discusses *actual* inequality, while our experiment is characterized by *potential* inequality. Nevertheless, a positive probability of implementation of the discriminatory policy would already lead to inequality *in expectation*. Furthermore, given their actual observations in the experiment, many migrants learn that inequality gets implemented in at least some periods. Aquino et al. (1992) additionally support our expectations as the authors document that both real inequality and perceived inequality (i.e., subjects feeling treated unequally) tend to weaken cooperation. Thus we expect the behavioral effects of actual inequality to obtain also in our experiment, albeit possibly in a diluted form.

and Houser et al. (2012) demonstrate that individuals who feel that they are treated unfairly in an interaction with another person are more likely to cheat going forward. Based on these findings, we predict that contributing migrants, faced with citizens who vote for discrimination, will become less likely to cooperate in the future. We thus state our third hypothesis as follows:

Hypothesis 3 *The more citizens discriminate against migrants, the lower the probability of migrants contributing to the SSW system.*

Our remaining three hypotheses cover citizens' discrimination behavior. Hypothesis 4 relates to the treatment effect in levels of discrimination. In this first hypothesis addressing citizen behavior, we assume that citizens decide without considering the effect of their choices on how migrants may respond to them in subsequent periods. Under this assumption, discrimination is likely to be primarily driven by profit maximization (Koplin, 1963).[13] Yet profit maximization is available as a motive for discrimination only in MODERATE and EXTREME, since citizens in INEFFICIENT reap no monetary benefits from discriminating. If citizens choose without conditioning their behavior on its potential effect on future migrant decisions, fully profit-maximizing citizens would always vote for discrimination in MODERATE and EXTREME, while they would be indifferent in INEFFICIENT. Citizens whose behavior is to some degree driven by concern about the payoff to others would face greater incentives for discrimination in EXTREME than in MODERATE, since the payoffs from discrimination—given a fixed level of migrant contributions—are greater in the former than in the latter. Accordingly, average voting rates for discrimination should be highest in EXTREME and lowest in INEFFICIENT. In light of these arguments, our fourth hypothesis is:

Hypothesis 4 *The greater the level of inequality available in the discriminatory policy, the higher the probability of citizens discriminating against migrants.*

Our final two hypotheses relate to potential drivers of discrimination that are rooted in motives that condition on the behavior of others. For the fifth hypothesis, we assume that citizens condition their behavior on the past decisions of their peers. We derive this assumption from the existing literature confirming conditional interactions in public goods games (Li et al., 2013; Battu and Srinivasan, 2020). This literature shows that conditional behavior can arise from social norms, (Bicchieri, 2010), herding (Ferraro and Vossler, 2010), or peer pressure (Mittone and Ploner, 2011).

Social norms are implicit behavioral rules based on shared expectations of how individual group members should typically behave in a given situation; they arise when individual decisions positively or negatively impact others' outcomes, like in the case of public goods provision (Fehr, 2004; Bicchieri, 2010). In general, they induce positive feedback loops between individual and group behavior: the more members of a group follow a social norm,

[13]Other motives include interdependent preferences, envy, or spite (Hoffman et al., 1994; Fehr and Fischbacher, 2002), but we consider these drivers likely to be of lesser importance relative to the profit maximization motive.

the more strongly others are motivated to follow it too (Burke and Young, 2011). In our study, voting for the discriminatory policy may be—or may become—a social norm.

Herding, on the contrary, may be driven by rational considerations (see the literature on rational herding, e.g., Anderson and Holt, 1997; Hung and Plott, 2001; Kübler and Weizsäcker, 2004; Willinger and Ziegelmeyer, 1998) or by the wish to economize on cognitive resources, since following others' example is cognitively less demanding than deciding on an idiosyncratic strategy (see the literature on social learning, e.g., Schlag, 1998; Rendell et al., 2010, 2011; Heyes, 2016).

Peer pressure can significantly affect individual behavior in decision making (Mani et al., 2013). When their choices are observed by peers (like in our experiment, where the end-of-period payoff screen reveals how many citizens voted for policy implementation), individuals may be encouraged to emulate the decisions of others without much reflection (Mittone and Ploner, 2011; Cheng et al., 2020). In our case, citizens may vote for the discriminatory policy solely out of peer pressure. Mittone and Ploner (2011) furthermore find that group identity supports peer pressure. This effect, too, is likely to be active in our experiment, since our group formation task was designed to induce precisely such feelings of group identity among our participants. We specify our fifth hypothesis as follows:

Hypothesis 5 *The probability of a citizen discriminating against migrants increases in the number of other citizens who discriminated against migrants in the (recent) past.*

Besides the assumed conditional behavior between citizens, we expect a conditional relationship between citizens and migrants. Citizens anticipate potential effects of their own actions on migrants' decisions. Through such a channel, discrimination can for example function as a form of punishment. Houser and Xiao (2010) show that many people punish after having received disadvantageous outcomes. We take this as evidence for reciprocal concerns and use it to formulate Hypothesis 6. We predict the following steady-state outcome after some initial fluctuations: citizens will reciprocate migrants' behavior by discriminating when the latter do not contribute and refraining from discriminating when the latter do. In a sense, discrimination may thus serve an educational device used by citizens intending to 'teach' migrants to behave cooperatively. Note that in INEFFICIENT, this may be the main driver of votes for discrimination. The reason is that citizens in INEFFICIENT have no direct (i.e., unconditional) profit incentive for discriminating against migrants, because citizens reap no personal monetary benefits from such discrimination. Our sixth hypothesis thus is:

Hypothesis 6 *The probability of a citizen discriminating against migrants decreases in the number of migrants who contributed in the (recent) past.*

5. Results

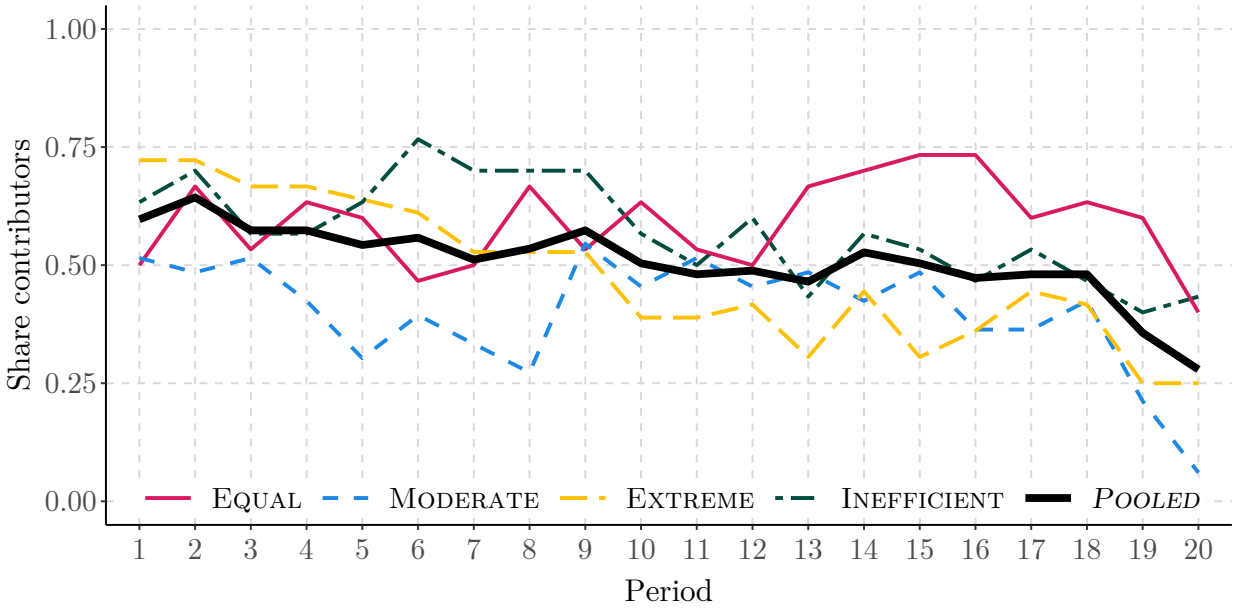
We first report our findings regarding the contribution behavior of migrants and then those regarding the discrimination behavior of citizens.[14] All of our results are robust to controlling for subject characteristics (See online appendix B for details).

[14]We analyze our data using *R-4.0.5* (R Core Team, 2017), reading them in using package *ztree* (Kirchkamp, 2019). We run multilevel probit regressions using the `glmer` function from the lme4 pack-

5.1. Migrant behavior

We begin our analysis of migrant behavior by studying mean contribution rates and their development over time. Figure 3 plots the average share of migrants contributing to the SSW system (which, due to the binary nature of contributions, equals average contribution rates) by period, both pooled over the four treatments and separately for each. We observe typical endgame effects (Stoecker, 1983; Selten and Stoecker, 1986). Contribution rates drop in period 19 in all treatments and again in period 20 in treatments EQUAL and MODERATE. We therefore exclude periods 19 and 20 from the remaining analyses.

Figure 3:
Time path of average share of migrants contributing to the social security and welfare system



Note: Solid lines show the average share of migrants contributing to the SSW system under the equal policy (EQUAL) and pooled for all policies/treatments (*POOLED*); dashed lines show shares under the discriminatory policies (MODERATE, EXTREME, and INEFFICIENT). Average contribution rates in a given matching group and period are 0, $0.\dot{3}$, $0.\dot{6}$ or 1, depending on the number of migrants in the matching group who contribute to the SSW system.

The all-treatment pooled contribution rate follows a downward trend, just as in most repeated linear public goods games (see, e.g., Ledyard, 1995, 2020). Average contributions decline from 59.7 percent in period 1 to 48.1 percent in period 18. In the individual treatments, a similar trend obtains in MODERATE, EXTREME and (to a lesser extent) INEFFICIENT.

Turning to the between-treatment differences in contribution rates, we list average contribution rates and the number of sessions per treatment in Table 2. We observe the highest contribution rates in EQUAL, closely followed by INEFFICIENT, and considerably lower rates

age (Bates et al., 2020) and generate regression tables using *texreg* (Leifeld, 2013). For the remaining tables we use *kableExtra* (Zhu et al., 2020), for the figures *ggplot2* (Wickham, 2016).

Table 2:
Treatment summary for migrants contributing to the social security and welfare system

Treatment	Sessions	Average contribution rates
EQUAL	10	60.2
MODERATE	11	43.1
EXTREME	12	50.5
INEFFICIENT	10	59.1

Note: The table shows the number of sessions and average contribution shares over periods 1 through 18, separately for each treatment. See online appendix OA.3 for a version of the table including all periods, i.e., 1 through 20.

in MODERATE. However, these differences turn out not to be statistically significant when we use participants' average contribution rates from periods 1–18 as the independent observations in an one-way, between-subjects ANOVA ($F(3, 125) = 2.08$, $p = .1058$). In general, migrants' lower average contribution rates in MODERATE and EXTREME compared to EQUAL and INEFFICIENT would be consistent with discriminatory policies having a negative impact on average contribution rates. However, observing differences in average contribution rates in the different treatments would not yet allow us to pin down whether the differences arise from the mere availability of such policies or from their actual implementation. This interdependence between contribution decisions, policy treatment variations and policy voting decisions of citizens is what we are interested in. To account for this interplay of factors, we continue our analysis at the participant×period level using multilevel probit regressions. We present the results in Table 3.

Our model includes three hierarchical levels to account for the nested structure of our data: the level of the participant (level 1), that of the period (level 2) and that of the matching group (level 3). In Model 1 we regress a migrant's binary contribution decision (1 = contribute) in the current period on four treatment dummy variables to be able to test for treatment differences in the probability of contributing. To account for treatment-specific time trends, we include interactions between the treatment dummies and the period number, P. Overall, a good model fit is indicated by AIC decreasing from 2325.07 in the NULL-model to 2267.23 in Model 1. A log-likelihood ratio test comparing Model 1 to the NULL-model also yields a significant result ($\chi^2(7) = 71.8402, p < .0001$). Since our models do not include a constant, we refrain from interpreting the coefficients of the treatment dummies themselves. When we analyze these coefficients using a Tukey post-hoc test, we find that the coefficients of EXTREME ($z = 2.6414$, $p = .0410$) and INEFFICIENT ($z = 2.5982$, $p = .0459$) are significantly larger than that of MODERATE, indicating a significantly higher probability to contribute in those two treatments compared to MODERATE. The higher probability of contributing in EXTREME and INEFFICIENT is further supported by the fact that we find coefficients significantly greater than zero for EXTREME ($b = 1.11$, $z = 3.0447$, $p = .0023$) and INEFFICIENT ($b = 1.16$, $z = 2.8822$, $p = .0040$) only. These results reflect the picture painted by Table 2. All other pairwise comparisons yield no significant results (all $p > .05$). The significant, negative coefficients of the interaction terms of P with both

Table 3:
Multilevel probit regression for a migrant contributing to the social security and welfare system.

Dependent Variable: $ContribOwn_t$				
	(1)	**(2)**	**(3)**	**(4)**
Equal (.5|.5)	0.17	-1.05^{***}		
	(0.38)	(0.25)		
Moderate (.6|.4)	-0.24	-1.40^{***}	-0.70	-0.73
	(0.36)	(0.24)	(0.38)	(0.39)
Extreme (.8|.2)	1.11^{**}	-0.88^{**}	-0.43	-0.26
	(0.36)	(0.28)	(0.44)	(0.45)
Inefficient (.5|.4)	1.16^{**}	-0.62^{*}	0.49	0.26
	(0.40)	(0.29)	(0.52)	(0.52)
Equal:P	0.02	0.01		
	(0.01)	(0.01)		
Moderate:P	-0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.02)	(0.02)
Extreme:P	-0.10^{***}	-0.06^{***}	-0.03	-0.03
	(0.01)	(0.01)	(0.02)	(0.03)
Inefficient:P	-0.06^{***}	-0.04^{*}	-0.09^{**}	-0.08^{**}
	(0.02)	(0.02)	(0.03)	(0.03)
$ContribOwn_{t=1}$		1.07^{***}	0.99^{***}	0.99^{***}
		(0.15)	(0.21)	(0.21)
$ContribOwn_{t-1}$		0.45^{***}	0.31^{*}	0.32^{**}
		(0.08)	(0.12)	(0.12)
$ContribOthers_{t-1}$		0.88^{***}	0.61^{***}	0.64^{***}
		(0.12)	(0.18)	(0.20)
$Policy_{t-1}$			-0.85^{***}	
			(0.11)	
Moderate:$Policy_{t-1}$				-0.84^{***}
				(0.16)
Extreme:$Policy_{t-1}$				-1.17^{***}
				(0.20)
Inefficient:$Policy_{t-1}$				-0.38
				(0.25)
AIC	2267.23	2127.77	1072.61	1070.33
ΔAIC	-139.86	-239.46	-55.68	-57.96
Log Likelihood	-1122.61	-1049.88	-523.30	-520.17
Num. obs.	2193	2193	1188	1188
Num. groups: ID	129	129	99	99
Num. groups: R.S	43	43	33	33
Num. groups: Period	17	17	12	12

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Note: The dependent variable, $Own.Contrib_t$, is migrant i's binary decision to contribute (1) to the SSW system in period t or not (0). We include dummy variables for all treatments (thus estimating the models without constant): The respective treatment dummies (Equal, Moderate, Extreme, Inefficient) equal 1 (0) if migrant i is (not) part of this treatment. We also include the full set of treatment interactions with P to control for a time trend. P is a discrete (time) variable representing the periods. $Own.Contrib_{t=1}$ is migrant i's (non-)contribution in period 1. $Own.Contrib_{t-1}$ is migrant i's (non-)contribution in the period preceding the current one. $Other.Contrib_{t-1}$ is the share of migrants other than migrant i who chose to contribute in the preceding period; it corresponds to 0 if no other migrant contributed, to .5 if one and to 1 if both other migrants contributed. $Policy_{t-1}$ is a dummy variable for whether the discriminatory policy was implemented in the preceding period (1) or not (0), starting with period 6 as the possibility to vote on discrimination becomes available. The inclusion of $Policy_{t-1}$ requires us to drop treatment Equal from the regression, since there is no option to discriminate in this treatment. We finally include the full set of treatment interactions with $Policy_{t-1}$ to test whether policy decisions affect subsequent contribution decisions differently in the three treatments that allowed citizens to vote for policies. Furthermore, our use of lagged variables and data on citizens' voting decisions (available from period 6) result in a limited sample period. To facilitate the comparison between Model 1 and Model 2, we exclude period 1 in Model 1. Thus, Model 1 and Model 2 use dependent variable observations from periods 2 through 18, and Model 3 and Model 4 from periods 7 through 18. We report standard errors in parentheses. See online appendix OA.4 for a table that reports (i) Model 1 with period 1, (ii) Model 2 without periods 1–6 and without Equal, and (iii) Model 2 without Equal.

EXTREME ($b = -.10$, $z = -7.0086$, $p < .0001$) and INEFFICIENT ($b = -.06$, $z = -3.9186$, $p < .0001$) confirm the time trend observed for these two treatments in Figure 3. The interaction between P and the EQUAL treatment dummy yields no significant evidence of a time trend in this treatment ($b = 0.02$, $z = 1.7299$, $p = .0836$).

Model 2 extends Model 1 by including the contribution decision in the first period as a proxy of a participant's 'type', interpreted as being either generally cooperative ($ContribOwn_{t=1} = 1$) or not ($ContribOwn_{t=1} = 0$).[15] We also include the participant's once lagged contribution decision and the once lagged share of other migrants who contributed. Positive and significant coefficients for the contribution decision in the first period ($b = 1.07$, $z = 6.9991$, $p < .0001$) and also the lagged contribution decision ($b = 0.45$, $z = 5.7149$, $p < .0001$) indicate behavioral stability of the contribution decision. We also find a significantly positive coefficient for the other migrants' lagged average contribution decisions ($b = 0.88$, $z = 7.4300$, $p < .0001$). A decrease in AIC to 2127.77 from 2267.23 in Model 1 and a significant log-likelihood ratio test ($\chi^2(3) = 145.4636, p < .0001$) document increased model fit.

Model 3 adds the outcome of citizens' policy votes (1 = discriminatory), lagged by one period, to study how migrants react to the (non)implementation of a discriminatory policy. Note that when we include this predictor, we need to exclude observations from treatment EQUAL, as citizens did not have the option of implementing discriminatory policies in this treatment. The coefficient of the lagged policy vote result is significant and negative ($b = -0.85$, $z = -7.5110$, $p < .0001$). Thus, when citizens vote to implement a discriminatory policy, migrants become less likely to contribute in the subsequent period. A decrease in AIC to 1072.61 from 1128.29 in Model OA9 (online appendix Table OA.4) and a significant log-likelihood ratio test ($\chi^2(1) = 57.6817, p < .0001$) document increased model fit.[16]

In Model 4 we include the full set of interactions between the treatments MODERATE, EXTREME and INEFFICIENT with the dummy variable for policy implementation. This allows us to study whether, when a discriminatory policy is implemented, its effect on migrants' contribution behavior differs depending on the level of inequality the policy entails. We find significantly negative coefficients for the interaction with MODERATE ($b = -0.84$, $z = -5.0974$, $p < .0001$) and EXTREME ($b = -1.17$, $z = -5.8273$, $p < .0001$), with the latter being the largest effect. We find no significant effect for treatment INEFFICIENT ($b = -0.38$, $z = -1.5325$, $p = .1254$). A decrease in AIC to 1070.33 from 1128.29 in Model OA9 (Table OA.4 in the online appendix), and a significant log-likelihood ratio test ($\chi^2(3) = 63.9562, p < .0001$) document increased model fit.

Hypothesis 1 expresses our expectation that migrants' willingness to contribute diminishes in the level of inequality available through the discriminatory policy. Given the varying coefficients of the treatment dummies in Models 1 to 4 and our results from the earlier ANOVA, however, we conclude that there is no clear evidence of a significant treatment effect in overall contribution rates. We thus formulate our first result as follows:

[15] The classification can of course not capture strategic considerations for contributing in the first period.

[16] The reference model for the log-likelihood ratio test is Model 3 without $Policy_{t-1}$, i.e., Model OA9 in the online appendix Table OA.4, so that the log-likelihood ratio test can be performed with the same sample.

Result Hypothesis 1 *We do not identify a consistent effect of the level of inequality available in the discriminatory policy on migrants' contribution probability.*

The significant, positive coefficient of the share of other migrants contributing in the preceding period, which remains positive and significant after controlling for the policy implemented in the preceding period (Models 3 and 4), shows that migrants condition their contribution decision on the past contribution decisions of the other migrants. We formulate our next result in favor of Hypothesis 2:

Result Hypothesis 2 *Migrants' probability of contributing to the SSW system increases in the share of (other) migrants who contributed in the preceding period.*

In our third hypothesis regarding migrant behavior, we study the effect of the actual implementation of the discriminatory policy. Our results on this question are clear. Model 3 documents that implementation of the policy leads to reduced migrant contributions to the SSW system in the subsequent period. The same conclusion is borne out when we study the effect more closely in Model 4. All three interaction terms between the treatments and the implementation dummy carry negative signs. The coefficient of the interaction with Inefficient is not significant, and Tukey post-hoc tests detect no significant differences between the effects of the three interaction terms (for all pairwise comparisons, $p > .05$). Our third result is thus clearly in line with Hypothesis 3:

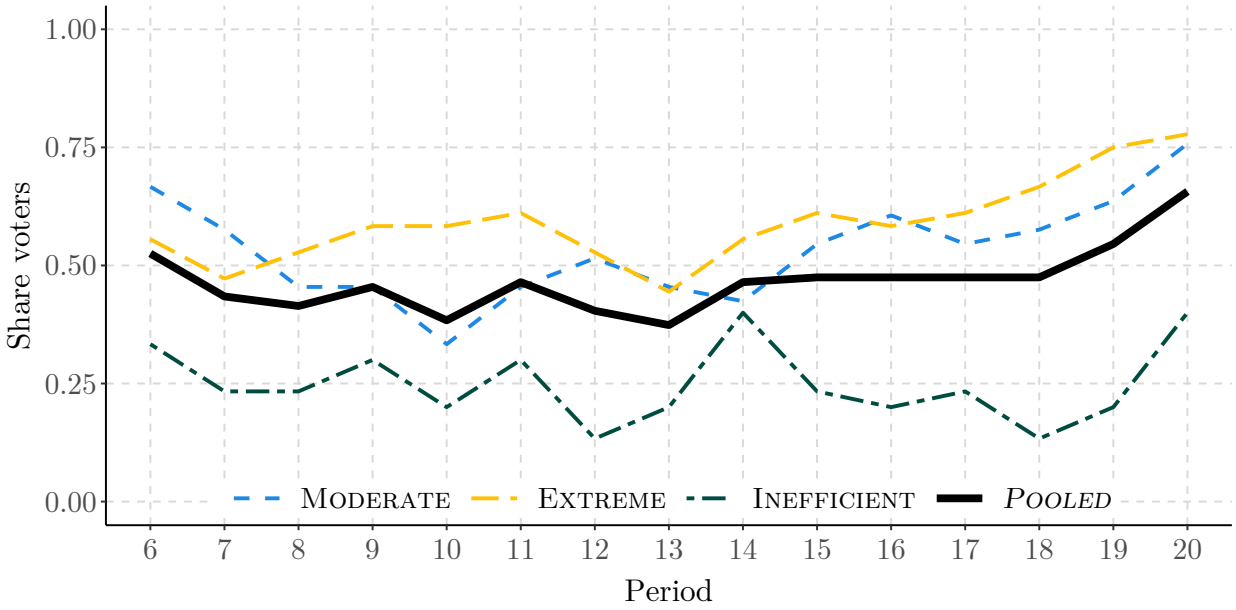
Result Hypothesis 3 *Migrants' probability of contributing to the SSW system decreases in the period following the implementation of a discriminatory policy.*

5.2. Citizen behavior

We continue our analysis by studying citizens' mean voting decisions and these decisions' development over time, depicted both in pooled form and by treatment, in Figure 4. Note that as policy implementation requires a majority vote (i.e., two of the tree citizens voting in favor), implementation rates differ slightly from vote shares (but they exhibit the same trends, as documented by Figure OA.1 in the online appendix). We again observe an endgame effect in the form of an increasing share of citizens voting for the implementation of the discriminatory policy starting with period 19. Both for this reason and in the interest of consistency with the results regarding the migrants, we thus exclude the last two periods from our further analyses of citizen behavior.

Unlike in migrants' contribution behavior, we do not observe a clear time trend in citizens' voting behavior. The overall share of citizens voting for the implementation of the discriminatory policy starts at 52.5 percent in period 6 and ends at 47.5 percent in period 18. However, we see clearly lower voting shares throughout the experiment in treatment Inefficient, with shares starting at 33.3 percent in period 6 and ending at 13.3 percent in period 18. We confirm this difference in overall mean voting shares by the findings documented in Table 4. In Inefficient, citizens on average vote for the implementation of the discriminatory policy in 24.1 percent of all votes. In contrast, citizens on average voted

Figure 4:
Time path of the average share of citizens voting for implementation of the discriminatory policy



Note: The solid line shows the average share of citizens voting for the implementation of the discriminatory policy pooled for all policies/treatments (POOLED); dashed lines show shares under the discriminatory policies (MODERATE, EXTREME, and INEFFICIENT). Average voting rates are 0, $0.\dot{3}$, $0.\dot{6}$ or 1, depending on the number of citizens in a matching group voting for implementing the policy.

more often to implement the discriminatory policy in both treatment MODERATE and treatment INEFFICIENT. A one-way, between-subjects ANOVA of subject mean voting decisions over periods 6 through 18 yields a significant result ($F(2, 96) = 8.93$, $p = .0003$). Pairwise comparisons with t-tests and Bonferroni correction show that mean voting decisions for the discriminatory policy in INEFFICIENT are significantly lower than in both MODERATE ($t = 3.2548$, $p = .0047$) and EXTREME ($t = 4.0169$, $p = .0004$), while the latter two do not differ significantly ($t = 0.7135$, $p = 1.000$). Note that both MODERATE and EXTREME provide incentives for participants with selfish (i.e., payoff maximizing) preferences to vote for discriminatory policy implementation which are absent in INEFFICIENT. Our results thus show that, when such incentives for selfish votes are absent, efficiency concerns or pro-social preferences limit voting for the discriminatory policy. Conversely, if efficiency is not an issue or the selfish incentives outweigh other-regarding considerations, i.e., in treatments MODERATE and EXTREME, the level of inequality that the policy results in does not affect vote shares. This suggests a type of binary behavior: When they can personally profit from its implementation, citizens with predominantly selfish preferences vote for the policy—irrespective of the precise level of inequality available (hence no significant difference between MODERATE and EXTREME). When these same citizens cannot personally profit from the policy's implementation, they vote against its implementation. They thus do not exhibit behavior driven by such motivations as spite (utility from decreasing the payoff of

others) or interdependent preferences (utility from receiving higher payoffs than others).

Table 4:
Treatment summary for citizens discriminating against migrants

Treatment	Sessions	Average voting shares
MODERATE	11	50.8
EXTREME	12	56.4
INEFFICIENT	10	24.1

Note: The table shows the number of sessions and average voting shares over periods 6 through 18, separately for each treatment. See online appendix OA.5 for a version of the table including all periods, i.e., 6 through 20.

We analyze predictors of citizen voting behavior using multilevel probit regressions and present the results in Table 5. We again account for the nested data structure at the participant (level 1), period (level 2) and matching group (level 3) levels. Model 5 includes dummy variables for the three treatments with payoff-relevant citizen decisions, and interactions of these dummies with P. Using Tukey post-hoc tests, we find no significant treatment differences (for all pairwise comparisons $p > .05$) for the treatment dummies when controlling for treatment-specific time trends. Overall, AIC decreases from 1179.54 in the NULL-Model to 1169.04 in Model 5 and a likelihood ratio test yields a significant result ($\chi^2(5) = 20.4935, p = .0010$).

Model 6 adds the individual citizen's lagged voting decision and a dummy variable for whether the discriminatory policy was implemented in the matching group in the preceding period. We also add the individual citizen's voting decision in period 6 as a proxy for the participant's preference prior to observing the decisions of their fellow citizens. The latter yields a significantly positive coefficient ($b = 1.06$, $z = 4.6262$, $p < .0001$): Those who voted for implementation of the discriminatory policy in period 6 are more likely to do so in subsequent periods. Similarly, a citizen's vote in the preceding period has a significant effect ($b = 0.87$, $z = 6.1878$, $p < .0001$). However, whether a policy was implemented in the preceding period does not significantly affect a citizen's probability to vote for the policy in the current period after controlling for the citizen's own voting history. For the model overall, AIC decreases by 67.68 compared to Model 5 and a likelihood-ratio test is significant ($\chi^2(3) = 73.6824, p < .0001$).

To analyze the dependence of voting behavior on migrant contribution behavior, in Model 7 we finally include interactions of the treatment dummies with migrant contribution shares, lagged by one period. We find that, for all three treatments, the interaction with the share of contributing migrants in the preceding period obtains significantly negative coefficients ($b = -1.41$, $z = -4.7960$, $p = .0000$ for MODERATE; $b = -.76$, $z = -2.4669$, $p = .0136$ for EXTREME; $b = -1.53$, $z = -3.9267$, $p < .0001$ for INEFFICIENT). AIC decreases by 37.66 compared to Model 6 and a likelihood-ratio test is significant ($\chi^2(6) = 117.3438, p < .0001$). This suggests that citizens condition their voting behavior on migrants' contribution behavior. When migrants contribute, citizens do not discriminate against them, but when migrants fail to contribute, citizens 'punish' them by voting to implement the discriminatory policy.

Table 5:
Multilevel probit regression for a citizen voting for implementation of the discriminatory policy.

	Dependent Variable: $Vote_t$		
Independent Variables	**(5)**	**(6)**	**(7)**
MODERATE (.6|.4)	-0.43	-1.53^{***}	-0.80^{*}
	(0.39)	(0.37)	(0.38)
EXTREME (.8|.2)	-0.33	-1.26^{***}	-0.50
	(0.40)	(0.36)	(0.43)
INEFFICIENT (.5|.4)	-0.99^{*}	-1.45^{***}	0.15
	(0.46)	(0.41)	(0.56)
MODERATE:P	0.03	0.04	0.04
	(0.02)	(0.02)	(0.02)
EXTREME:P	0.04	0.04	0.02
	(0.02)	(0.02)	(0.02)
INEFFICIENT:P	-0.03	-0.03	-0.08^{*}
	(0.03)	(0.03)	(0.03)
$Vote_{t=6}$		1.06^{***}	0.86^{***}
		(0.23)	(0.23)
$Vote_{t-1}$		0.87^{***}	0.85^{***}
		(0.14)	(0.14)
$Policy_{t-1}$		-0.19	-0.32^{*}
		(0.14)	(0.14)
MODERATE:$ContribShare_{t-1}$			-1.41^{***}
			(0.29)
EXTREME:$ContribShare_{t-1}$			-0.76^{*}
			(0.31)
INEFFICIENT:$ContribShare_{t-1}$			-1.53^{***}
			(0.39)
AIC	1169.04	1101.36	1063.70
ΔAIC	-10.05	-67.68	-37.66
Log Likelihood	-575.52	-538.68	-516.85
Num. obs.	1188	1188	1188
Num. groups: ID	99	99	99
Num. groups: R.S	33	33	33
Num. groups: Period	12	12	12

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Note: The dependent variable, $Vote_t$, is a citizen's i's binary decision whether to vote for (1) or against (0) the discriminatory policy in period t. We include the full set of discriminatory treatment dummies (the models are thus estimated without constant): The respective treatment dummy MODERATE, EXTREME, INEFFICIENT) equals 1 [0] if citizen i is [not] part of this treatment. We also include the full set of treatment interactions with P to control for a time trend. P is a discrete (time) variable representing the periods. $Vote_{t=6}$ is citizen i's vote in period 6. $Vote_{t-1}$ is citizen i's vote in the period preceding the current one. $Policy_{t-1}$ is a dummy variable for whether the discriminatory policy was implemented in the preceding period; it equals 1 [0] if the policy is [not] implemented. We finally include the full set of treatment interactions with $ContribShare_{t-1}$ to test whether contributions affect subsequent discrimination votes. $ContribShare_{t-1}$ corresponds to 0 if no migrant contributes to the SSW system in the period preceding the current one, to $0.\dot{3}$ if one contributes, to $0.\dot{6}$ if two contribute and it corresponds to 1 if all three migrants contribute. We lose data at the beginning due to our use of lagged variables. In favor of the comparison between Model 5 and Model 6, we exclude period 6 in Model 5 also. Thus, all models comprise dependent variable observations from periods 7 through 18 (remember that the possibility to vote on discrimination becoming available in period 6). We report standard errors in parentheses.

Turning to Hypothesis 4, which states that the probability to vote for the discriminatory policy increases with the level of inequality, we find the treatment effects to be more stable for citizens' voting decisions than they were for migrants' contribution decisions. The ANOVA and pairwise tests suggest that citizens are significantly less likely to vote for the discriminatory policy in treatment INEFFICIENT. Nevertheless, once we control for time development and past decisions in the regressions reported in Table 5, we no longer detect significant treatment differences. One reason for this finding may be that, as shown in Model 7, a citizen's vote for the (non-)implementation of the different policies is highly dependent on the behavior of migrants. We thus conservatively conclude:

Result Hypothesis 4 *Citizens' probability of discriminating against migrants is not significantly affected by the policy's level of inequality.*

Our next hypothesis, Hypothesis 5, postulates that participants condition their voting behavior on the voting behavior of the other citizens. Model 6 does not offer support for this conjecture, since the coefficient of the lagged policy decision is not significant. When including migrants' contribution shares in the preceding periods, interacted with the treatment dummies in Model 6, the effect becomes significant, but is negative rather than positive. Consequently, policy implementation in the preceding period (and thus a high number of votes for the policy in the preceding period) results in a decreased probability of voting for the discriminatory policy. This finding could be a result of citizens observing that the implementation of discriminatory policies resulted in decreased contributions of migrants in the subsequent period. Our finding thus is:

Result Hypothesis 5 *Citizens' probability of discriminating against migrants decreases in the share of (other) citizens who discriminated in the preceding period.*

Finally, regarding Hypothesis 6, we find significantly negative coefficients for the lagged share of contributing migrants in all treatments. Post-hoc tests comparing the coefficients of the treatment×contribution share interactions detect no treatment differences (for all pairwise comparisons, $p > .05$). Taken together, we find support for Hypothesis 6:

Result Hypothesis 6 *Citizens' probability of voting for discrimination decreases in the share of migrants who contributed to the SSW system in the preceding period.*

6. Conclusion

Migration is a major issue dominating world politics. More than 90 percent of all migrants are economic migrants (Ratha, 2014), i.e., people who leave their homes in search of a better economic outlook. However, economic migrants are often seen as a social and economic burden on destination countries. In particular, they face discrimination in both the labor market and welfare system (Pekkala Kerr and Kerr, 2011; Giulietti, 2014).

Our study focuses on one particular area of contention in this large discussion. We investigate the reciprocal willingness of destination country citizens and economic migrants

to allow for, and to engage in, integration into the labor market and the SSW system. Our results document a strong reciprocal relationship between citizens' and migrants' behavior. Migrants reward 'friendly' behavior of citizens by contributing to the SSW system, while they withhold their contributions when citizens discriminate against them. Moreover, the highest contribution rates (.60) occur under circumstances where discrimination is not possible. Furthermore, citizens reward 'friendly' behavior by migrants by voting for equal distribution of SSW system benefits, while they vote for discrimination when migrants do not contribute. We thus conclude that discrimination reduces the willingness to contribute, while a lack of contributions, in turn, induces discrimination. This unfortunate relationship can easily lead to a downward spiral and thus constitutes a poor basis for mutually beneficial co-existence in a society.

A closer look at our data reveals that migrants' contributions are driven by their own decisions in the past (which we see as a potential proxy for an inherent 'type') as well as by other migrants' past contribution choices. We thus detect an underlying effect of migrants' inherent behavioral types, of path dependency, and of a reciprocal relationship within the group of migrants. Similar patterns hold for citizens as well. Their choices are positively related to their own past choices, but interestingly are negatively related to past policy decisions. Apart from these conditional behavioral patterns, our results reveal a general trend for contributions to decline over time. (The latter is not a novel insight, as declining contributions are common in decision situations that resemble public goods games.)

The results of this paper suggest that there may be a need for more research into the determinants of migrants' preferences for contributing and the factors that can encourage cooperative behavior. Finding ways to manage and make productive use of economic migration such that it contributes more (and is more clearly perceived to contribute) to the destination countries' economic and social developments is imperative. In light of our findings, we recommend that policy makers adapt immigration policies promoting socially fair outcomes.

Policy makers can contribute to tackling the global problem of aging societies by ensuring proper (early) labor market attachment of migrants. According to UNDESA (2020), Asia, Europe and Northern America currently have the highest proportion of people aged 65 and older relative to the total population. In addition, OECD (2019) forecasts a 10 percent decrease in the global working-age population by 2060; i.e., for every 100 people of working age (20 to 64) there will then be 58 people of old age (65+). Thus the world may—before the end of the century—experience a shortage of the workers necessary to maintain its current standard of living; the problem is particularly grave for Northern America and Europe (UNDESA, 2020), which are also the destinations of choice for most economic migrants (World Bank Group, 2019).

For future research, our experimental game provides a ready framework for testing various other policies, such as social policies, employment polices or fiscal policies. Even though we follow the idea of having a close-to-reality method for testing and designing decision-making processes of citizens and migrants, we are aware that our design paints a simplified picture of the world. We thus make two suggestions: First, repeat the experiment with citizens who, like migrants, can choose whether or not they wish to participate in the labor market

(i.e., contribute to the social security and welfare system); this extension of the design would allow insights into non-employed citizens' decisions and tax evasion. Second, conduct the experiments with real economic migrants; interacting with real economic migrants instead of students in the role of economic migrants may offer additional insights, as the behavior of our student subjects in the role of migrants may differ from that of actual migrants, just as the behavior of participants in the role of citizens *towards* student subjects in the role of migrants may differ from their behavior towards actual migrants. This all leads to a better understanding of behavior in societies faced with the possibility of migratory inflow into their social security and welfare systems.

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