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Mental Accounting of Public Funds – The Flypaper Effect in the Lab*

by

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Abstract

We report evidence from a series of laboratory experiments that focus on mental accounting of 'public funds'. Groups of three players decide upon how much to redistribute within the group. We measure the preference to redistribute when transfers are made either out of individual accounts (the players' own money) or out of a common account (the group's money). Since the common account is dissolved after each round and paid out to individuals, its size should not affect the decision to redistribute. The experiment is designed to rule out an anchoring effect. We find that the (relative) size of the common account significantly affects redistribution behavior. Specifically, the transfer increases in the relative size of the common account – but only when the transfer is paid out of the common account (and not out of the individual account). We interpret these findings as evidence for a flypaper effect due to mental accounting and discuss implications for tax policy and government spending.

JEL classification: C92, D72, H31

Keywords: mental accounting, flypaper effect, lab experiments

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1 Introduction

Empirical evidence suggests that voters are more likely to agree to government expenditures out of excess tax revenue than out of new taxes. Precisely speaking, a positive shock in available public funds will result in higher public expenditures than if an equivalent shock occurred in the form of private income. In the literature, this effect is known as the 'flypaper effect' referring to the observation that the money sticks where it hits (Hines and Thaler 1995). The flypaper effect is hard to reconcile with standard models of policy-making. Optimal policy should be expected to equate the social marginal utility of public funds and that of private funds. It should not matter where these funds come from.

The literature provides a range of explanations for this phenomenon which we will review in section 2. In this paper, we report evidence from a lab experiment that allows focussing on one specific explanation for the flypaper effect: mental accounting (Thaler 1985). The concept of mental accounting assumes that households (or voters) assign different meanings to different kinds of funds. Public funds are 'meant' to be used for public expenditures. Hines and Thaler (1995) use this approach to theoretically explain the flypaper effect.

We consider potential flypaper effects in a situation with collective redistribution. Redistribution (or: a fair distribution of income) is one of the most important public goods in modern societies and especially suitable for analysis in economic lab experiments. We use a standard redistribution experiment (as in Tyran and Sausgruber 2006, Höchtel et al. 2012) in which groups of three players are formed. Two of them ('the rich') receive an amount of money, the third ('the poor') does not. All three players vote on how much is given to the poor player and the intermediate vote (the median voter's proposal) is realized. As a novel element, we introduce a *common account* which is dissolved and distributed to the rich players' accounts at the end of each round. We measure the impact of a variation of the *common account* on the transfer proposals. Since the variation in the *common account* is independent of the variation in the overall economy size, the *common account* should, in principle, be completely irrelevant for the transfer proposal. However, if the *common account* is mentally accounted for in a different way than the players' individual accounts, the size of the *common account* may have an impact on the transfer proposal.

In this setting, the mental accounting effect may potentially be confounded with an anchoring effect. Specifically, the size of the *common account* may just be a reference point used for 'anchoring' (and, thus, driving the size of) the

proposals. To control for this, we consider two different treatments in order to precisely identify mental accounting and rule out anchoring as the (only) driving force of our results. In the first treatment, the transfer is paid from the rich players' *individual accounts*. In the second treatment, the transfer is paid out of the *common account*. Since the money in the *common account* belongs to the rich players anyway, it should not matter in which way the money is taken from them. Our experiment, however, shows that the mode of representation, i.e. the framing of where the money comes from, matters.

We find that the transfer proposals and the actually realized transfers are significantly affected by the relative size of the *common account* (i.e. the public funds) – but only when transfers are paid out of the *common account*. To be precise, an increase in the common account (measured in per cent of the economy size) by ten percentage points increases the average proposal by 0.5 to 1.2 percentage points. Especially the poor voters demand more redistribution when the *common account* is large. Dividing the sample in different subgroups shows that those with below median math skills are prone to give more if the *common account* is relatively large. There are neither significant differences between male and female participants, though, nor between economics students and students from other disciplines. Using the proposals in the first part of the game (without a *common account*), we divide the participants into four groups (very selfish, mildly selfish, mildly generous, very generous). Unsurprisingly, it is mainly the two intermediate ('mildly') groups that react to changes in the relative size of the common account.

Our results prove to be robust in a number of checks. A change in the order of treatments does not significantly change our results. We also change the framing by using '*account 1*' and '*account 2*' instead of '*individual account*' and '*common account*'; if at all, the effects of the *common account* on the transfer proposals become larger. Finally, we change the voting mechanism to a random dictator regime. Whereas the number of extreme proposals (give nothing and full redistribution) increases, the average effect remains unaffected.

Our paper adds to the literature by replicating the flypaper effect in the lab – in the absence of all confounding institutional influences – and, thus, informs about concepts like mental accounting, framing and fungibility (to be reviewed in the next section). Our results imply that, even with sound and undistorting political institutions, voters may prefer an increase in public spending when public funds are available but reject them if they imply tax rate hikes. It follows that, depending on where the revenue shock occurs, voter populations

with identical preferences may end up with distinct levels of public spending.

The remainder of the paper is organized as follows. The next section reviews the literature on the flypaper effect and mental accounting. Section 3 describes the experimental setup. Section 4 reports the results of the experiment in the basic design and section 5 provides deeper insights by considering the results of two slight modifications. Section 6 concludes and discusses some implications.

2 Related literature and theory

The flypaper effect implies that governments are inclined to spend a large part (if not all) of an exogenous increase in public funds, e.g. due to a grant, but would not finance the spending increase via an increase in taxation. There are numerous studies using quasi-experimental designs to show the flypaper effect with real world data, e.g. Heyndels and Van Driessche (1998, 2002), Dahlberg et al. (2008), Gennari and Messina (2014), Vegh and Vuletin (2015), Allers and Vermeulen (2016).²

As indicated above, there is a whole range of explanations for the flypaper effect. For our purpose, it is useful to differentiate between behavioral explanations and non-behavioral ones. With regard to the latter, there might be, in some cases, straightforward institutional reasons why public funds (e.g. grants from the central government) may not be distributed via tax cuts to households, see e.g. Brooks and Phillips (2008). Moreover, Dahlby (2011) argues that the flypaper effect may well be explained within the neoclassical model of second-best taxation. As long as there is an excess burden of taxation, there is an efficient low level of public goods provision if the planner is (close to) benevolent. If this efficient cost per unit of tax revenue is increasing at a sufficiently steep slope, an increase in funds may lead to an over-proportional increase in spending.

Apart from this, the flypaper effect may be explained by imperfect political decision-making. For instance, governments might shy away from the equity debate that preceeds tax reforms. Spending additional funds on public goods may be the politically less costly option. Moreover, a dysfunctional political system may be expansionary, i.e. uses additional funds to grow instead of maximizing

²The flypaper effect is not restricted to the realm of public finance. For instance, Jacoby (2002) analyzes the flypaper effect of a school feeding program on caloric intake within families. Choi et al. (2009) consider the household's portfolio choice and detect a flypaper effect which may be due to mental accounting.

household utility. The latter, however, would not explain why a negative shock on public funds is not responded to by tax hikes. Roemer and Silvestre (2002) build a model in which the flypaper effect occurs as an outcome of multi-party political competition.

A behavioral explanation for the flypaper effect has first been given by Hines and Thaler (1995, henceforth HT95) who presume that the flypaper effect may be due to one of (or the combination of) three behavioral irregularities. First, loss aversion³ implies that taxpayers are “*much more sensitive to decreases in their welfare than to increases. This implies that the political cost of explicitly raising a tax is greater than the political benefit of an equivalent tax cut.*” (HT95, p. 223) This creates a policy discontinuity where additional need for public funds does not necessarily lead to tax hikes, and additional funds (grants) do not necessarily lead to tax cuts. However, this statement is based on the assumption that tax financed spending hikes are a welfare loss from the voters’ point of view. This does not necessarily need to be the case.

Second, HT95 consider the possibility that the flypaper effect is due to framing⁴: “*The choices to the public are not framed as between spending the money or cutting taxes, but rather how should the money be spent.*” (HT95, p. 223). While this may be true, it remains an open question why political competition does not provide alternative framings if they are welfare-enhancing.

Third, mental accounting implies that the fungibility of public funds may be limited. “*We know that changes in housing wealth, pension wealth and future income have very different effects on consumption than equivalent present value changes in current liquid assets or income. So, it should be no great surprise that households violate fungibility in evaluating their political leaders.*” (HT95, p. 223) If public funds are mentally accounted for by voters in a different way than private funds, the propensity to spend on certain goods may differ across types of funds: Public funds are ‘meant’ to be spent on public goods, private funds should be spent on private consumption goods. In this sense, funds are not perfectly fungible anymore, as one Euro in private funds is treated differently from one Euro in public funds.

Our lab experiment is designed to *exclusively* focus on mental accounting

³A number of papers assumes loss aversion to rationalize various features of the tax system, see, e.g., Elffers and Hessing (1997), Yaniv (1999), Bernasconi and Zanardi (2004), Kanbur et al. (2008), or Dhami and al Nowaihi (2007, 2010).

⁴For the impact of tax framing see, e.g., Chang et al. (1987), Robben et al. (1990a), Robben et al. (1990b), Schepanski and Shearer (1995), Kirchler and Maciejovsky (2001) and Copeland and Cuccia (2002). For dissenting evidence see, e.g., Schadewald (1989).

of public funds which may limit their fungibility.⁵ In the lab economy, there are, obviously, neither institutional restrictions on how to spend the money nor an efficiency cost of taxation. Moreover, there will be no active framing by policy-makers. The only framing we admit is that part of the available funds is labelled as '*common account*' whereas the remaining part is '*individual account*' (and we analyze the effect of this framing in a robustness check).

The basic idea of mental accounting as an explanation for non-standard behavior is established by Thaler (1985, 1990, 1999).⁶ It has been applied to consumer choices⁷, portfolio choice⁸, development aid⁹ and tax avoidance¹⁰. Abeler and Marklein (2017) report that participants in a field experiment change their consumption behavior depending on the way income is provided (in-kind vs. cash). Clingingsmith (2015) compares the amounts given in a dictator game when the endowment is earned versus when it is received as a windfall and finds that income from these sources is only partially fungible (see also Cherry 2001). Goerg et al. (2017) show that if income is provided by a party that is perceived as more similar to the recipient, senders give less in a dictator game. In contrast to these papers, we vary the type of account in which the endowment is provided.

A flypaper effect occurs whenever the response of public spending (e.g. for redistribution, as in our setting) to an (unexpected) increase in the public budget (e.g. a grant from the federal government) is larger than to an increase in the taxpayers' private budgets. In order to mimick such a situation, we have a *common account* and *individual accounts*. By construction, individuals should be indifferent between the different accounts. Our main focus is to test whether money provided in the *common account* is more likely to be spent on 'common purposes' (here: giving to the poor).¹¹

⁵The limit of fungibility may be partly due to loss aversion which is discussed later on.

⁶The related theory of narrow bracketing is developed i.a. by Tversky and Kahneman (1981) and Rabin and Weizsäcker (2009).

⁷See, e.g., Heath and Soll (1996), Milkman and Beshears (2009), Hastings and Shapiro (2013), Abeler and Marklein (2017).

⁸See, e.g., Choi et al. (2009).

⁹Pack and Pack (1990), van de Walle and Mu (2007) and Van de Sijpe (2013) find that revenue from development aid is not fungible and therefore has the impact the donors intended. For contradicting evidence see Khilji and Zambelli (1991) and Pack and Pack (1993). Kooreman (2000), Edmonds (2002) and Schady and Rosero (2008) evaluate the effectiveness of child benefit by analysing whether sources of household income matters.

¹⁰See, e.g., Fochmann and Wolf (2016).

¹¹A related approach is chosen by Fosgaard et al. (2014) who consider a public good game where participants can give to or take away from the public good. Although these two mechanisms are economically equivalent, the cooperation changes. The authors show that this is mainly due to changed beliefs about the other participants' behavior – an aspect which

For this purpose, we adopt the setting of a classical redistribution game for the experiment. Groups of three players are formed. Two of the players are 'rich' and have an individual endowment, one of them is 'poor' and has no endowment. Each player votes on the amount transferred to the poor player. In such a setting, it has been shown that, although any strategic incentive is absent, the average individual tends to vote for non-zero contributions to the poor player. For instance, Engel (2011) derives a giving ratio of .283 in a meta-study on dictator games. In ultimatum games the mean offer is about 40 per cent of the total endowment (Tisserand 2014). We introduce, as a novel element, a *common account* which is distributed to the rich players at the end of each round (which makes it effectively part of the rich players' individual fund). The main question is whether voting behavior is affected by the relative sizes of the *common account* and the *individual account*. In the absence of mental accounting, only the total amount of money should be relevant. How the money is labelled should be completely irrelevant. The lab experiment allows us to provide identical circumstances for voting where only the relative sizes of the *common account* and the individual budget is varied.

3 Experimental setup

The experiment took place at the University of Muenster in November 2015, January and June 2016. 264 students (117 female and 147 male) from various disciplines (Business: 26.9 per cent, Economics: 20.1, Law: 14.8, other: 38.3) drawn from a pool of students signed up in the online recruitment system ORSEE (Greiner 2015) participated in 16 sessions. Each session was conducted with 15 or 18 participants who had no opportunity to communicate during the experiment. Written instructions were handed out on paper and read aloud by the experimenter. Thereafter, participants had to do two control tasks (see appendices A.3 and A.4 for an English translation). Each session lasted approximately 80 minutes and finished with a short questionnaire. The questionnaire as well as the experiment were programmed in z-Tree (Fischbacher 2007). On average, participants earned 17.16 Euros.

Each session consists of 24 periods. Each period has five distinct stages.

is of minor importance in our study.

Stage 1 (Group formation and role assignment) All participants are randomly and anonymously matched in groups of three players. Each player is randomly assigned a 'type'. Within each group, two players are assigned the type *Green*, the third one the type *Blue*.¹² Types *Green* and *Blue* differ in endowments.¹³

Stage 2 (Endowments) The two type *Green* players receive a random but identical endowment of lab currency ("points", 30 points equal 1€) on their *individual account*, the type *Blue* player receives an endowment of zero. Next to their *individual account*, the two *Green* types are endowed with a random amount in a *common account*. Randomization is realized in two independent draws from a uniform distribution. First, we let the computer stochastically determine the size of the economy out of the interval $[30, 60]$. Then, the size of the *common account* is drawn from the interval $[0, 30]$. Thus, the *common account* can never be larger than the total size of the economy. The difference between the size of the economy and the *common account* is then split in half and assigned the *Green* types' *individual accounts*. All group members know each others' account balances as well as the *common account* balance.

Stage 3 (Transfer proposals, voting) At this stage, the group members vote on a transfer from the *Green* types to the *Blue* type player. All three players are asked to make a proposal how large the transfer is supposed to be. From the three proposals, the intermediate one is realized (which is equivalent to median voter rule). Only the realized transfer will, at stage 5, be revealed to the group members.

Stage 4 (Financing of transfer) The treatments differ in how the transfer is financed. In the INDIVIDUAL treatment, each of the type *Green* players pays half of the transfer out of her *individual account*. After that, the *common account* is dissolved and paid out to the type *Green* players' *individual accounts*. If the initial *individual account* is lower than half of the transfer, it turns neg-

¹²The fact that participants are of differing types over the course of the experiment weakens the motivation for redistribution – which may imply an underestimation of the effect. Since, however, we exploit the difference between treatments in which the motivation to redistribute is not altered, our results are, at least qualitatively, unaffected.

¹³The literature (Cherry et al. (2002), Oxoby and Spraggon (2008)) suggests that redistribution out of windfall endowments is larger compared to redistribution out of earned income. While this may be the case, our results do not depend on the absolute inclination to give to the poor but on the difference between treatments, see below.

ative; the deficit is later on compensated by the payment out of the *common account*. The maximum transfer cannot exceed the overall endowments by the type *Green* players. In the COMMON treatment, the transfer is paid out of the *common account*. Afterwards, the remainder of the *common account* is paid out to the *Green* types' *individual accounts*. If the *common account* turns negative due to a high transfer, the deficit is compensated out of the *individual accounts*.

Stage 5 (Payoffs) At the end of each period, the realized transfer and all group members' final account balances are revealed. Each player's period income (i.e. their final account balance) is stored. The aggregate income is paid out at the end of the experiment.

In both, the INDIVIDUAL and the COMMON treatment, the two type *Green* players receive half of all money in the economy after deducting the transfer to the type *Blue* player. If mental accounting is not relevant, both type *Green* players should realize that they pay half of the transfer out of their pockets. Then, the size of the *common account* should be completely irrelevant for the transfer proposals. However, in the presence of mental accounting, a large *common account* may be used to finance a large transfer since the *common account* is 'meant' to be used for group interests which is, here, redistribution. Then, all three players might be inclined to increase the transfer proposal if the *common account* is large.¹⁴

However, the literature suggests that individuals sometimes anchor their decisions on some salient, though irrelevant number. Such an irrelevant number may be the *common account*. In order to rule out that this number drives the transfer proposals, we use the variation within treatments. Note that, in both treatments, there is a *common account*. The only difference is that the transfer is either taken out of the *individual account* (INDIVIDUAL treatment) or the *common account* (COMMON treatment). In terms of payoffs, this differentiation is meaningless; in terms of mental accounting, it may affect the transfer proposal.

In the first six periods, the *common account* is endowed with zero points. We refer to this phase as the CONTROL treatment which allows us to collect

¹⁴Loss aversion may also play a subtle role here. Suppose that a type *Green* player mentally distinguishes between both accounts and considers the *individual account* as her personal endowment. A transfer paid out of her *individual account* is then perceived as an actual loss, whereas a transfer paid out of the *common account* is perceived as a decrease in the gain the player obtains when the account is dissolved. A segregated valuation of payment streams, thus, induces the type *Green* player to propose differently in the COMMON treatment.

information on the participants' propensity to give. In periods 7 to 15, participants are either in the INDIVIDUAL treatment or the COMMON treatment, in periods 16 to 24, the treatment is switched. We have thus intersubject and intrasubject variation.

One concern with the experiment design is that participants might think that they cannot give more than the endowment in the *common account*. We therefore provided a control task which explicitly used contributions that exceed the size of the *common account*. In the Appendix, we provide evidence that there is mild bunching of proposals at the *common account* size, but is not of major importance. Moreover, the bunching occurs in both treatments and, thus, leaves our main identification strategy unaffected.

4 Results

4.1 Basic results

Fig. 1 shows the mean proposal ratio (i.e. the proposal as a fraction of the size of the economy) over the 24 periods (left hand side) and the mean realized transfer ratio (right hand side). In period 1, the average proposal is 23.3 per cent of the economy size. There is a slight downward trend, but even in period 24, the players still propose on average 21.9 per cent of the economy size to the poor player (the type *Blue* player). The realized transfer is somewhat smaller (since it is usually a type *Green* player who makes the median proposal) and the downward trend is more pronounced. However, transfers are on average still more than 10 per cent of the economy in the last period, leaving the type *Green* player with a bit less than 45 per cent of the economy.

Table 1 shows the proposal ratio for the total sample and different subsamples. The total number of observations is 6336 and the average proposal ratio is 22 per cent of the economy size. A quarter of participants proposes a zero transfer to the type *Blue* player which is exclusively driven by type *Green* players' proposals and, interestingly, mostly by male participants. 5 per cent in total (14 per cent of the type *Blue* players) propose the full economy size. Again, this kind of selfish proposing behavior is mostly found with male players. Around half of all observations (3024) are from a sequence of treatments where the COMMON treatment comes first (periods 7-15) and the INDIVIDUAL treatment second (periods 16-24). The other half (3312) has the opposite sequence. Voting behavior between sequences does not fundamentally differ.

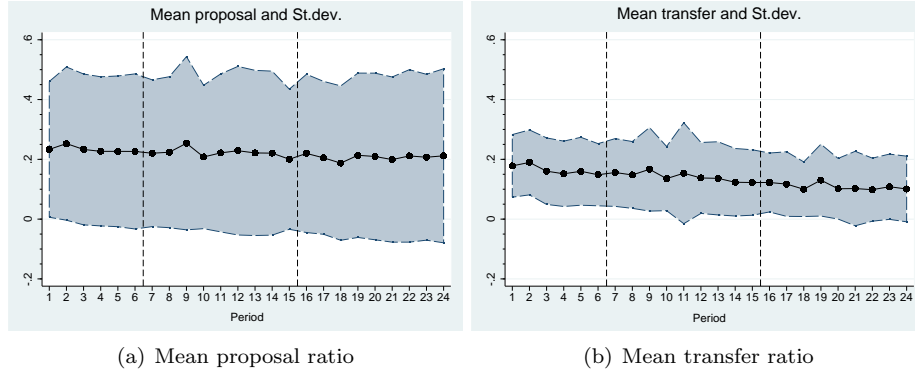


Figure 1: Mean proposals and mean transfers as a fraction of the size of the economy.

We now have a first look at the impact of a variation in the *common account* size. Fig. 2 shows the proposals (y-axis) for different *common account* sizes (x-axis), both measured as a fraction of the overall economy size. In the whole sample, the relative size of the *common account* is associated with larger amounts proposed to be given to the poor. A similar correlation is found for the realized transfers.

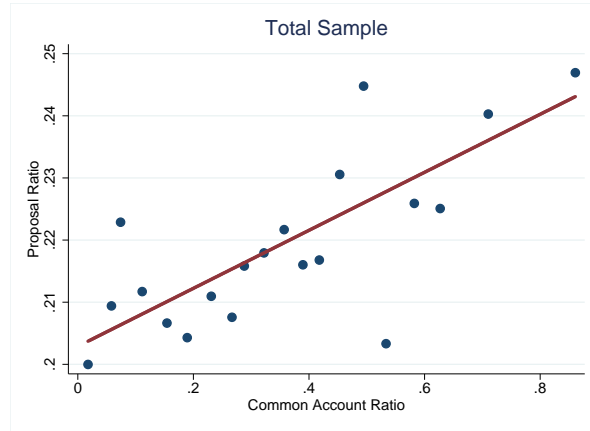


Figure 2: Proposals and *common account* size.

To rule out that this is entirely due to anchoring on the size of the *common account*, we now turn to the two treatments, INDIVIDUAL and COMMON.

Table 1: Descriptive statistics

	N	Participants	Proposal ratio	St.dev.	Extreme proposals	
					zero	max
Total	6336	264	0.22	0.26	0.26	0.05
Female	2808	117	0.21	0.21	0.16	0.02
Male	3528	147	0.23	0.30	0.34	0.08
<i>Green</i>	4224	264	0.09	0.12	0.39	0
<i>Blue</i>	2112	264	0.47	0.29	0	0.14
COM-IND	3024	126	0.21	0.27	0.28	0.05
IND-COM	3312	138	0.23	0.26	0.24	0.05

Notes: Proposal ratio as share of proposed points of economy size.

Zero (max) proposal as share of proposals with zero (maximum) points of all proposals.

In both treatments, the size of the *common account* may provide an anchor for the transfer. However, since the transfer is paid out of the *individual* or the *common account*, depending on the treatment, the mental accounting effect may differ. Fig. 3 shows the same binned scatter plot for each treatment (controlling for individual specific demographics and periods). The different slopes suggest that the association between *common account* size and proposals is stronger in the COMMON treatment – which is a first hint that, controlling for anchoring, mental accounting affects the players' votes on the transfer.

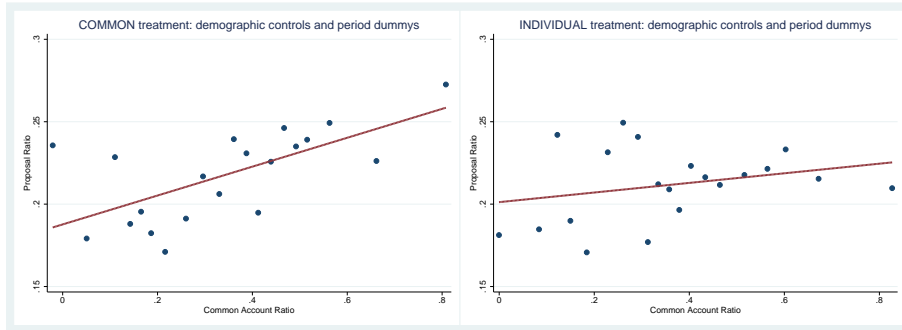


Figure 3: Binned scatter plot for each treatment.

Fig. 4 gives the estimated differences between mean proposals for *common account* sizes *below* and *above* median. Again, we control for periods. Whereas the difference is close to zero in the INDIVIDUAL treatment, it is significantly positive in the COMMON treatment. That is, only if the transfer to the poor is taken directly out of the *common account*, giving reacts to the *common account* size.

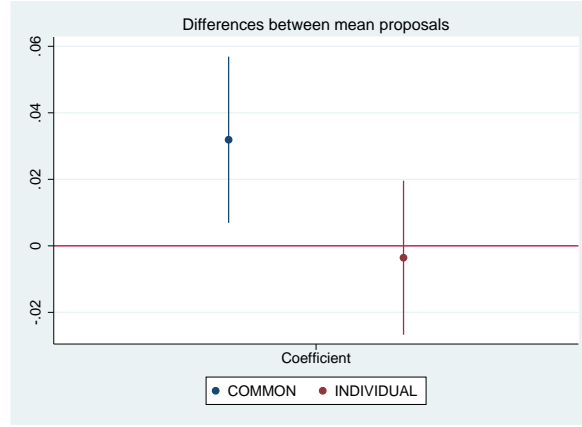


Figure 4: Differences between proposals for *common account* sizes below and above median.

4.2 Analysis

To gain further insights, we now turn to regression analysis. Let i be the index of individuals, j the index of a group and t the time index. The proposal for a transfer to the *Blue* type is denoted by $Prop_{it}$. Since we assume that fairness is a relative concept, i.e. others' endowments are considered fair relative to one's own endowment, we scale the proposal by the size of the economy, denoted by $Size_{jt}$, i.e. initial endowments of type *Green* players plus the *common account*. Thus, the variable of interest is the proposal ratio, $\frac{Prop_{it}}{Size_{jt}}$.

In the first six periods, the *common account* is fixed at zero. We use this phase to collect information on the participants' general willingness to give. Controlling for all observed and unobserved heterogeneity (by using fixed effects estimation) and using period dummies, the average proposal ratio is .258. The realized proposal ratio is .179.

After period 6, the two type *Green* players have a *common account*, denoted by $Common_{jt}$. As indicated above, the size of the *common account* is determined independently from the size of the economy. We start by regressing the proposal ratio on the *common account* ratio, allowing the size of the economy to have an impact:

$$\frac{Prop_{it}}{Size_{jt}} = a_0 + a_1 \frac{Common_{jt}}{Size_{jt}} + a_2 Size_{jt} + \mathbf{bX}_i + \varepsilon$$

where \mathbf{X}_i denotes the vector of player-specific socio-demographic variables.

Table 2 reports the regression results. It shows that the relative size of the *common account* has a significant impact on the relative size of the proposal. Starting with a simple OLS estimation in specification (1), an increase of the *common account* by 10 percentage points increases the proposal by 0.5 percentage points. Note that this is conditional on the size of the economy,¹⁵ i.e. a variation of the *common account* does not, in itself, add to the potential consumption of the two type *Green* players.

– Table 2 here –

The fact that the relative size of the *common account* has a significant impact is in line with the hypothesis that public funds are differently mentally accounted for than private funds. So far, however, we cannot rule out that this effect is due to simple anchoring. Players may take the *common account* as some (arbitrary) reference at which their proposal is measured. To rule out anchoring as the driving force behind this, we now make use of the two treatments, COMMON and INDIVIDUAL. In both treatments, the *common account* is a potential anchor, but only in the COMMON treatment, the transfer will be directly financed out of public funds, i.e. the *common account*.

Let COMMON denote a dummy that equals 1 if the participant is in the COMMON treatment and 0 if not. Now, consider the following regression equation.

$$\begin{aligned} \frac{Prop_{it}}{Size_{jt}} = & a_0 + a_1 \frac{Common_{jt}}{Size_{jt}} + a_2 \frac{Common_{jt}}{Size_{jt}} \times COMMON + a_3 COMMON \\ & + a_4 Size_{jt} + a_5 Size_{jt} \times COMMON + \mathbf{bX} + \varepsilon \end{aligned}$$

The results are reported in Table 3. The simple OLS estimation in column

¹⁵The economy size has a small (but statistically significant) negative effect on the proposal ratio.

(1) shows that the sum of the coefficients $a_1 + a_2$ is larger than a_1 alone, but imprecisely measured. In the subsequent estimation, we add some obvious controls (2), period dummies (3), and all available controls (4), before eliminating all individual-specific time-invariant heterogeneity by the use of fixed effects (5) and period dummies (6). Including period dummies, the impact of *common account* ratio in the COMMON treatment is almost eight times as large as in the INDIVIDUAL treatment, and the difference is statistically significant on the 1 per cent level. Adding the two coefficients, this implies that an increase in the *common account* ratio by ten percentage points increases the proposal ratio by 0.9 percentage points.

– Table 3 here –

So far, we did not differentiate between the sequence of treatments. Table 4 reports the coefficient estimates of the *common account* ratio for different subsamples according to when the treatment took place. Independent in which sequence the treatments took place, a significant impact of the *common account* ratio on the proposal ratio only occurs in the COMMON treatment. The effect is, however, somewhat smaller, when the COMMON treatment comes after the INDIVIDUAL treatment.

– Table 4 here –

Table 5 measures the impact of the *common account* ratio on the proposal ratio separately for each treatment. This mostly captures the results derived for the total sample with treatment interactions; it illustrates, though, the substantial difference between the treatments. The coefficient estimate on the *common account* ratio is five times as large in the COMMON treatment compared to the INDIVIDUAL treatment and it is significant on the 1 per cent level. The estimations reported in columns (3) and (4) reveal that the impact of the *common account* ratio in the COMMON treatment is clearly significant for both type *Green* and type *Blue* players. However, the impact is triple the size for the type *Blue* players. Column (5) shows the estimation results including the lag variable of the transfer economy size ratio. Past transfers may be an indicator of some kind of social norm that influences the participants' redistribution behavior. In fact, an increase of the lagged transfer ratio by 10 percentage points increases the proposal by 1.2 percentage points. The estimate of the interaction term stays robust, though.

– Table 5 here –

Additionally, we split the sample in those with an Abitur grade in math above the median and below. It turns out that the mental accounting effect only occurs with those with a below median Abitur grade in math. This finding is in line with other studies that show that some behavioral anomalies are related to skills (see e.g. Abeler and Marklein 2017). Then, we split the sample in female and male participants. Here, the results suggest that there is no difference between men and women with respect to the impact of the treatment.

– Table 6 here –

Table 1 shows that one third of the proposals are either extremely low or extremely high, i.e. the participants propose zero points as a *Green* player and demand the total amount of points as a *Blue* player. These kind of very selfish participants show no treatment effect as they do not respond to a change in the *common account* balance. To distinguish different types of participants with respect to their proposal behavior, we split the sample into four parts. We assign types according to the mean proposals as *Green* players in the first six rounds, in which the *common account* balance was zero. We take this mean proposals to form four groups: very selfish (.007), mildly selfish (.039), mildly generous (.12) and very generous players (.17).¹⁶ Table 7 shows, that the COMMON treatment does not have an impact on the extremely selfish and extremely generous participants. The treatment effect is mainly driven by the other half of the participants, who exhibit moderate redistribution preferences.

– Table 7 here –

5 Extensions

To get a deeper understanding of the main drivers of mental accounting in our experiment we slightly change the design. The first modification concerns the name of the accounts in such a way that we call the '*individual account*' '*account 1*' and the '*common account*' '*account 2*'. In four sessions with 51 participants (26 female and 25 male), we gathered the data used in Table 8. The results show

¹⁶The numbers in brackets show the mean proposal ratio in the periods 7 to 24, when the participant was a *Green* player.

that mental accounting does not seem to be driven by the labels of the accounts. The fixed effects regression gives a coefficient estimate for the treatment effect more than twice as high as in the basic design whereas the mean proposal ratio (0.20) corresponds almost exactly to the mean in the basic design (0.22). It should be noted, though, that the sample size is considerably smaller.

– Table 8 here –

The second modification concerns the rules how the transfer to the type *Blue* player is determined. In the baseline design, the transfer size is chosen by the median voter. Literature provides some arguments that the voting mechanism may influence the results due to strategic behavior (see e.g. Strulovici 2010). For example participants might hide behind the median voter and therefore take extreme positions, i.e. they propose either zero or the whole economy depending on their type.¹⁷ To check whether the voting rule has an impact, we replace the median voter procedure by the random dictator procedure. Note that this design is identical to the baseline design in all regards except for the decision rules. In four sessions with 69 students (31 female and 38 male) we collected the data used in Table 9. The results show that our main findings are not affected by the voting mechanism, which is in line with Höchtel et al. (2012). While mental accounting can be identified in all designs the random dictator rule seems to lead to more extreme proposals (basic design: .301; random dictator design: .533). One possible explanation may be that, if the decisive individual is chosen randomly from the three group members, it is more likely that an extreme proposal is realized as a transfer.¹⁸ Therefore, in contrast to the median voter rule the revelation of very selfish preferences is as likely as the revelation of more moderate preferences. As a consequence, participants with a moderate preference for redistribution may respond to the new information and adjust their behavior.¹⁹

– Table 9 here –

¹⁷Shayo and Harel (2012) and Kamenica and Brad (2014) find factors influencing the voters decision that go beyond someone's material motivation especially when the probability of being pivotal is very small.

¹⁸This is reflected by the share of extreme transfers of the total number of transfers (basic design: .180; random dictator design: .556).

¹⁹For a theoretical model of learning about other people's preferences by observing their voting behavior see Aytimur et al. (2014).

6 Discussion

We consider a setting in which individuals decide on 'public spending' (here: redistribution to the poor) either out of their individual accounts or out of a common account (the 'public budget'). Since the common account belongs to the 'rich' individuals anyway, the size of the common account should have no impact on the decision on how much to spend, i.e. give to the poor. However, our lab experiment shows that the transfer to the poor player increases in the size of the public budget - if it is taken out of the common account. By contrasting this setting with another one in which the transfer needs to be financed out of the individual account (a pure accounting difference), we rule out that this finding is due to anchoring.

Anchoring may, of course, be part of the flypaper story in the real world (in the sense that a large public budget may suggest large public spending to both politicians and voters). Our experiment, however, provides evidence that anchoring is not the entire story.

We interpret our results as showing that public funds are mentally accounted for in a different way than private funds. Mental accounting may thus explain why voters urge the government to take on new tasks if revenue is available, but are reluctant to agree to tax increases when revenue is not available. It implies that it makes a difference for public spending patterns whether an economy experiences a revenue shock on the private or on the public side. It may also explain some of the procyclical spending pattern which can be observed in many countries.

It has to be conceded that the highly artificial situation in the lab somewhat restricts the scope for interpretation of real worlds spending decisions. However, if mental accounting can be observed in this transparent, often repeated situation, it may at least establish the argument that this kind of non-standard behavior may affect real-world decisions. It should also be stressed that we aim at explaining voter behavior which - under plausible conditions - is more likely to be boundedly rational than professional politicians' behavior.

References

- [1] Abeler, J. & Marklein, F. (2017). Fungibility, Labels, and Consumption. *Journal of the European Economic Association*, 15(1): 99-127.
- [2] Allers, M. A. & Vermeulen, W. (2016). Capitalization of equalizing grants and the flypaper effect. *Regional Science and Urban Economics*, 58: 115-129.
- [3] Aytimur, R. E., Boukouras, A. & Schwager, R. (2014). Voting as a signaling device. *Economic Theory*, 55(3): 753-777.
- [4] Bernasconi, M. & Zanardi, A. (2004). Tax Evasion, Tax Rates, and Reference Dependence. *FinanzArchiv/Public Finance Analysis*, 60(3): 422-445.
- [5] Brooks, L. & Phillips, J. H. (2008). An Institutional Explanation for the Stickiness of Federal Grants. *Journal of Law, Economics, and Organization*, 26(2): 243-264.
- [6] Chang, O. H., Nichols, D. R. & Schultz, J. J. (1987). Taxpayer attitudes towards tax audit risk. *Journal of Economic Psychology*, 8(3): 299-309.
- [7] Cherry, T. L. (2001). Mental Accounting and Other-Regarding Behavior: Evidence from the Lab. *Journal of Economic Psychology*, 22(5): 605-615.
- [8] Cherry, T. L., Frykblom, P. & Shogren, J. F. (2002). Hardnose the Dictator. *American Economic Review*, 92(4): 1218-1221.
- [9] Choi, J. J., Laibson, D. & Madrian, B. C. (2009). Mental Accounting in Portfolio Choice: Evidence from a Flypaper Effect. *American Economic Review*, 99(5): 2085-2095.
- [10] Clingingsmith, D. (2015). Mental Accounts and the Mutability of Altruism: An Experiment with Online Workers. Working Paper.
- [11] Copeland, P. & Cuccia, A. (2002). Multiple Determinants of Framing Referents in Tax Reporting and Compliance. *Organizational Behavior and Human Decision Processes*, 88(1): 499-526.
- [12] Dahlberg, M., Mörk, E., Rattsø, J. & Ågren, H. (2008). Using a discontinuous grant rule to identify the effect of grants on local taxes and spending. *Journal of Public Economics*, 92(12): 2320-2335.
- [13] Dahlby, B. (2011). The marginal cost of public funds and the flypaper effect. *International Tax and Public Finance*, 18(3): 304-321.
- [14] Dhami, S. & al-Nowaihi, A. (2007). Why do people pay taxes? Prospect theory versus expected utility theory. *Journal of Economic Behavior & Organization*, 64(1): 171-192.

- [15] Dhami, S. & al-Nowaihi, A. (2010). Optimal income taxation in the presence of tax evasion: Expected utility versus prospect theory. *Journal of Economic Behavior & Organization*, 75(2): 313-337.
- [16] Edmonds, E. (2002). Reconsidering the labeling effect for child benefits: evidence from a transition economy. *Economics Letters*, 76(3): 303-309.
- [17] Elffers, H. & Helsing, D. J. (1997). Influencing the Prospects of Tax Evasion. *Journal of Economic Psychology*, 18(2-3): 289-304.
- [18] Engel, C. (2011). Dictator games: a meta study. *Experimental Economics*, 14(4): 583-610.
- [19] Fischbacher, U. (2007). Z-Tree: Zurich toolbox for readymade economic experiments. *Experimental Economics*, 10(2): 171-178.
- [20] Fochmann, M. & Wolf, N. (2016). Mental Accounting in Tax Evasion Decisions - An Experiment on Underreporting and Overdeducting. Working Paper available at SSRN: <https://ssrn.com/abstract=2595070>.
- [21] Fosgaard, T. R., Hansen, L. G. & Wengström, E. (2014). Understanding the nature of cooperation variability, *Journal of Public Economics*, 120: 134-143.
- [22] Gennari, E. & Messina, G. (2014). How sticky are local expenditures in Italy? Assessing the relevance of the flypaper effect through municipal data. *International Tax and Public Finance*, 21(2): 324-344.
- [23] Goerg, S. J., Johanson, D. B. & Roger, J. D. (2017). Endowments, perceived similarity, and dictator giving. *Economic Inquiry*, 55(2): 1130-1144.
- [24] Greiner, B. (2015). Subject pool recruitment procedures: organizing experiments with ORSEE. *Journal of the Economic Science Association*, 1(1): 114-125.
- [25] Hastings, J. S. & Shapiro, J. M. (2013). Fungibility and Consumer Choice: Evidence from Commodity Price Shocks. *Quarterly Journal of Economics*, 128(4): 1449-1498.
- [26] Heath, C. & Soll, J. B. (1996). Mental Budgeting and Consumer Decisions. *Journal of Consumer Research*, 23(1): 40-52.
- [27] Heyndels, B. & Van Driessche, F. (1998). Mental Accounting in Local Public Sector Budgeting: An Empirical Analysis for the Flemish Municipalities. *Eastern Economic Journal*, 24(4): 381-394.
- [28] Heyndels, B. & Van Driessche, F. (2002). How municipalities react to budgetary windfalls. *Economics of Governance*, 3(3): 211-226.
- [29] Hines Jr., J. R. & Thaler, R. H. (1995). Anomalies: The Flypaper Effect. *The Journal of Economic Perspectives*, 9(4): 217-226.

- [30] Höchtel, W., Sausgruber, R. & Tyran, J.-R. (2012). Inequality aversion and voting on redistribution. *European Economic Review*, 56(7): 1406-1421.
- [31] Jacoby, H. G. (2002). Is there an intrahousehold 'flypaper effect'? Evidence from a school feeding programme. *The Economic Journal*, 112(476): 196-221.
- [32] Kamenica, E. & Brad, L. E. (2014). Voters, dictators, and peons: expressive voting and pivotality. *Public Choice*, 159(1-2): 159-176.
- [33] Kanbur, R., Pirttilä, J. & Tuomala, M. (2008). Moral Hazard, Income Taxation, and Prospect Theory. *The Scandinavian Journal of Economics*, 110(2): 321-337.
- [34] Khilji, N. M. & Zampelli, E. M. (1991). The Fungibility of US Assistance to Developing Countries and the Impact on Recipient Expenditures: A Case Study of Pakistan. *World Development*, 19(8): 1095-1105.
- [35] Kirchler, E. & Maciejovsky, B. (2001). Tax compliance within the context of gain and loss situations, expected and current asset positions, and profession. *Journal of Economic Psychology*, 22(2): 173-194.
- [36] Kooreman, P. (2000). The Labeling Effect of a Child Benefit System. *American Economic Review*, 90(3): 571-583.
- [37] Milkman, K. L. & Beshears, J. (2009). Mental accounting and small windfalls: Evidence from an online grocer. *Journal of Economic Behavior & Organization*, 71(2): 384-394.
- [38] Oxoby, R. J. & Spraggon, J. (2008). Mine and yours: Property rights in dictator games. *Journal of Economic Behavior & Organization*, 65(3-4): 703-713.
- [39] Pack, H. & Rothenberg Pack, J. (1990). Is Foreign Aid Fungible? The Case of Indonesia. *The Economic Journal*, 100(399): 188-194.
- [40] Pack, H. & Rothenberg Pack, J. (1993). Foreign Aid and the Question of Fungibility. *The Review of Economics and Statistics*, 75(2): 258-265.
- [41] Rabin, M. & Weizsäcker, G. (2009). Narrow Bracketing and Dominated Choices. *American Economic Review*, 99(4): 1508-1543.
- [42] Robben, H. S. J., Webley, P., Elffers, H., & Hessing, D. J. (1990a). Decision frames, opportunity, and tax evasion: An experimental approach. *Journal of Economic Behavior and Organization*, 14(3): 353-361.
- [43] Robben, H., Webley, P., Weigel, R. H., Warneryd, K.-E., Kinsey, K. A., Hessing, D. J., Martin, F. A., Elffers, H., Wahlund, R., Van Langenhove, L., Long, S. B. & Scholz, J. T. (1990b). Decision frames and opportunity as determinants of tax cheating: An international experimental study. *Journal of Economic Psychology*, 11(3): 341-364.

- [44] Roemer, J. E. & Silvestre, J. (2002). The 'Flypaper Effect' Is Not an Anomaly. *Journal of Public Economic Theory*, 4(1): 1-17.
- [45] Schady, N. & Rosero, J. (2008). Are Cash Transfers Made to Women Spent Like Other Sources of Income? *Economics Letters*, 101(3): 246-248.
- [46] Schadewald, M. (1989). Reference Point Effects In Taxpayer Decision Making. *Journal of the American Taxation Association*, 89(10): 68-84.
- [47] Schepanski, A. & Shearer, T. (1995). A Prospect Theory Account of the Income Tax Withholding Phenomenon. *Organizational Behavior and Human Decision Processes*, 63(2): 174-186.
- [48] Shayo, M. & Harel, A. (2012). Non-consequentialist voting. *Journal of Economic Behavior & Organization*, 81(1): 299-313.
- [49] Strulovici, B. (2010). Learning While Voting: Determinants of Collective Experimentation. *Econometrica*, 78(3): 933-971.
- [50] Thaler, R. (1985). Mental Accounting and Consumer Choice. *Marketing Science*, 4(3): 199-214.
- [51] Thaler, R. (1990). Anomalies: Savings, Fungibility, and Mental Accounts. *Journal of Economic Perspectives*, 4(1): 193-205.
- [52] Thaler, R. (1999). Mental Accounting Matters. *Journal of Behavioral Decision Making*, 12(3): 183-206.
- [53] Tisserand, J.-C. (2014). The ultimatum game, a meta-analysis of 30 years of experimental research. Working Paper.
- [54] Tversky, A. & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481): 453-458.
- [55] Tyran, J.-R. & Sausgruber, R. (2006). A little fairness may induce a lot of redistribution in democracy. *European Economic Review*, 50(2): 469-485.
- [56] Van de Sijpe, N. (2013). The Fungibility of Health Aid Reconsidered. *The Journal of Development Studies*, 49(12): 1746-1754.
- [57] van de Walle, D. & Mu, R. (2007). Fungibility and the Flypaper Effect of Project Aid: Micro-Evidence for Vietnam. *Journal of Development Economics*, 84(2): 667-685.
- [58] Vegh, C. A. & Vuletin, G. (2015). Unsticking the flypaper effect in an uncertain world. *Journal of Public Economics*, 131: 142-155.
- [59] Yaniv, G. (1999). Tax Compliance and Advance Tax Payments: A Prospect Theory Analysis. *National Tax Journal*, 52(4): 753-764.

Appendix

A.1 Tables

Table 2: Effect of *Common Account* Ratio on Proposal Ratio (total sample)

Dependent variable: <i>Proposal Ratio_{it}</i>						
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) FE	(6) FE
Common Account Ratio	0.0499*** (0.0192)	0.0483** (0.0193)	0.0455** (0.0198)	0.0436** (0.0198)	0.0516*** (0.0144)	0.0488** (0.0170)
Economy Size	-0.0011** (0.0005)	-0.0011** (0.0005)	-0.0011** (0.0005)	-0.0011** (0.0005)	-0.0013*** (0.0003)	-0.0012*** (0.0003)
Abitur Grade		0.0001 (0.0001)	0.0001 (0.0001)	0.0002* (0.0001)		
Female		-0.0240** (0.0116)	-0.0241** (0.0117)	-0.0164 (0.0120)		
Economics		0.0030 (0.0118)	0.0030 (0.0118)	0.0016 (0.0118)		
Constant	0.248*** (0.0243)	0.243*** (0.0330)	0.237*** (0.0360)	0.266*** (0.0490)	0.253*** (0.0157)	0.248*** (0.0229)
Period Dummys	NO	NO	YES	YES	NO	YES
Controls	NO	NO	NO	YES	NO	NO
Observations	4752	4752	4752	4752	4752	4752
Cluster/Groups	264/-	264/-	264/-	264/-	16/264	16/264
<i>Notes:</i> Standard errors in parentheses. In OLS estimates, standard errors are clustered by subject id, in FE estimates by sessions. * p < 0.10, ** p < 0.05, *** p < 0.01.						

Table 3: Effect of *Common Account* Ratio across treatments (total sample)

Dependent variable: <i>Proposal Ratio_{it}</i>						
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) FE	(6) FE
COMMON Dummy	0.0114 (0.0506)	0.0151 (0.0505)	0.0004 (0.0515)	-0.0001 (0.0514)	-0.0292 (0.0230)	-0.0469* (0.0254)
Common Account Ratio	0.0272 (0.0264)	0.0241 (0.0261)	0.0191 (0.0263)	0.0185 (0.0264)	0.0172 (0.0164)	0.0109 (0.0182)
Common Account Ratio × COMMON Dummy	0.0463 (0.0378)	0.0448 (0.0377)	0.05002 (0.0382)	0.0520 (0.0383)	0.0724*** (0.0145)	0.0800*** (0.0154)
Economy Size	-0.0009 (0.0006)	-0.0009 (0.0006)	-0.0010 (0.0007)	-0.0010 (0.0006)	-0.0013*** (0.0004)	-0.0014*** (0.0005)
Economy Size × COMMON Dummy	-0.0004 (0.0010)	-0.0005 (0.0010)	-0.0002 (0.0010)	-0.0002 (0.0010)	0.0003 (0.0005)	0.0006 (0.0005)
Abitur Grade		0.0001 (0.0001)	0.0002 (0.0001)	0.0002* (0.0001)		
Subj. Math Ability		-0.0192*** (0.0062)	-0.1920*** (0.0059)	-0.0169*** (0.0063)		
Female		-0.0178 (0.0114)	-0.0179 (0.0114)	-0.0163 (0.0120)		
Economics		0.0003 (0.0115)	0.0004 (0.0115)	0.0014 (0.0118)		
Constant	0.242*** (0.0341)	0.271*** (0.0419)	0.271*** (0.0450)	0.263*** (0.0526)	0.266*** (0.0197)	0.266*** (0.0254)
Period dummies	NO	NO	YES	YES	NO	YES
Controls	NO	NO	NO	YES	NO	NO
Observations	4752	4752	4752	4752	4752	4752
Cluster/Groups	264/-	264/-	264/-	264/-	16/264	16/264
<i>Notes:</i> Standard errors in parentheses. COMMON dummy takes the value of 1 in the COMMON treatment and 0 otherwise. Ability is a self-evaluation on math skill measured by a fivepoint Likert scale.						
* p < 0.10, ** p < 0.05, *** p < 0.01.						

Table 4: Comparison of sequences (FE)

Dependent variable: *Proposal Ratio_{it}*

		(1) COMMON treatment	(2) INDIVIDUAL treatment
Common Account Ratio	Period 07 - 15	0.1116*** (0.0246)	0.0199 (0.0253)
	Period 16 - 24	0.0888*** (0.0195)	0.0253 (0.0197)

Notes: Standard errors in parentheses. Estimates include period dummies.
 * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 5: Comparison of subgroups and lag variables (FE)

Dependent variable: <i>Proposal Ratio_{it}</i>					
	(1) INDIVIDUAL	(2) COMMON	(3) GREEN	(4) BLUE	(5) LAG
Common Account Ratio	0.0231 (0.0151)	0.1000*** (0.0148)	0.0097 (0.0119)	0.0483 (0.0452)	0.0140 (0.0180)
Economy Size	-0.0016*** (0.0004)	-0.0008 (0.0003)	-0.0003 (0.0004)	-0.0024*** (0.0007)	-0.0014*** (0.0005)
COMMON Dummy			-0.0515** (0.0210)	0.0491 (0.0363)	-0.0437* (0.0234)
Common Account Ratio × COMMON Dummy			0.0602*** (0.0166)	0.1464*** (0.0483)	0.0747*** (0.0005)
Economy Size × COMMON Dummy			0.0006 (0.0005)	-0.0018** (0.0008)	0.0006 (0.0005)
L.Transfer Ratio					0.1174** (0.0472)
Constant	0.291*** (0.0244)	0.221*** (0.0213)	0.0682*** (0.0173)	0.599*** (0.0408)	0.251*** (0.0261)
Observations	2376	2376	3168	1584	4752
Cluster/Groups	16/264	16/264	16/264	16/264	16/264
<i>Notes:</i> Standard errors in parentheses. Estimates include period dummies.					
* p < 0.10, ** p < 0.05, *** p < 0.01.					

Table 6: Comparison of subgroups (cont.) (FE)

Dependent variable: <i>Proposal Ratio_{it}</i>						
	(1) Math skills (> median)	(2) Math skills (< median)	(3) Female	(4) Male	(5) Economics	(6) Non- Economics
Common Account Ratio	0.0226 (0.0316)	0.0005 (0.0310)	0.0635** (0.0231)	-0.0284 (0.0242)	-0.0222 (0.0259)	0.0402 (0.0294)
Economy Size	-0.0016 (0.0010)	-0.0013** (0.0006)	-0.0006 (0.0005)	-0.0021** (0.0008)	-0.0024** (0.0008)	-0.0004 (0.0009)
COMMON Dummy	-0.0229 (0.0420)	-0.0738 (0.0493)	-0.0373 (0.0314)	-0.0458 (0.0600)	-0.0848 (0.0503)	-0.0136 (0.0489)
Common Account Ratio × COMMON Dummy	0.0044 (0.0385)	0.1512*** (0.0312)	0.0735* (0.0368)	0.0771** (0.0303)	0.1038*** (0.0341)	0.0621** (0.0281)
Economy Size × COMMON Dummy	0.0008 (0.0010)	0.0005 (0.0010)	0.0002 (0.0007)	0.0008 (0.00011)	0.0010 (0.0008)	-0.0002 (0.0010)
Constant	0.275*** (0.0435)	0.259*** (0.0380)	0.196*** (0.0276)	0.320*** (0.0428)	0.318*** (0.0440)	0.218*** (0.0388)
Observations	2376	2376	2106	2646	2232	2520
Cluster/Groups	16/132	16/132	16/117	16/147	16/124	16/140
<i>Notes:</i> Standard errors in parentheses. Estimates include period dummies. Math skills measured by Abitur grade in math. * p < 0.10, ** p < 0.05, *** p < 0.01						

Table 7: Redistribution types

	Dependent variable: <i>Proposal Ratio_{it}</i>			
	(1) very selfish FE	(2) mildly selfish FE	(3) mildly generous FE	(4) very generous FE
COMMON Dummy	-0.0123 (0.1230)	-0.1193 (0.0709)	-0.0354 (0.0506)	-0.0085 (0.0596)
Common Account Ratio	0.0451 (0.0505)	-0.0440 (0.0313)	-0.0292 (0.0427)	0.0681** (0.0277)
Common Account Ratio × COMMON Dummy	-0.0423 (0.0512)	0.1608*** (0.0472)	0.1383** (0.0495)	0.0520 (0.0608)
Economy Size	-0.0036** (0.0014)	-0.0023*** (0.0007)	-0.0010 (0.0009)	0.0005 (0.0008)
Economy Size × COMMON Dummy	0.0013 (0.0024)	0.0011 (0.0013)	0.0000 (0.0010)	0.0001 (0.0011)
Constant	0.361*** (0.0669)	0.279*** (0.0348)	0.276*** (0.0525)	0.169*** (0.0397)
Share of Females in %	18.2	50.0	54.5	54.5
Share of Economics in %	66.7	47.0	37.9	36.4
Observations	1188	1188	1188	1188
Cluster/Groups	15/66	16/66	14/66	15/66
<i>Notes:</i> Standard errors in parentheses. Estimates include period dummies. * p<0.10, ** p<0.05, *** p<0.01.				

Table 8: Effect of Common Account Ratio in Framing design

	(1) INDIVIDUAL	(2) COMMON	(3) OLS	(4) FE
Common Account Ratio	0.0208 (0.0734)	0.181** (0.0354)	-0.0493 (0.0863)	-0.0003 (0.0741)
Economy Size	-0.0005 (0.0008)	-0.0012 (0.0006)	0.0003 (0.0019)	-0.0003 (0.0009)
COMMON Dummy			-0.0488 (0.148)	-0.0801 (0.0684)
Common Account Ratio × COMMON Dummy			0.229* (0.117)	0.173** (0.0512)
Economy Size × COMMON Dummy			-0.0019 (0.0022)	-0.0007 (0.0011)
Constant	0.255** (0.0648)	0.172*** (0.0294)	0.237** (0.114)	0.253** (0.0719)
Observations	459	459	918	918

Standard errors in parentheses. Estimates include period dummies.
Models in columns 1 and 2 are estimated with fixed effects regression.
* p<0.10, ** p<0.05, *** p<0.01

Table 9: Effect of Common Account Ratio in Random design

	(1) INDIVIDUAL	(2) COMMON	(3) OLS	(4) FE
Common Account Ratio	-0.0437 (0.0237)	0.0833* (0.0305)	-0.0436 (0.0876)	-0.0330 (0.0260)
Economy Size	0.0004 (0.0005)	-0.0002 (0.0004)	0.0004 (0.0021)	0.0005 (0.0006)
COMMON Dummy			-0.0291 (0.157)	-0.0150 (0.0596)
Common Account Ratio × COMMON Dummy			0.131 (0.130)	0.111* (0.0457)
Economy Size × COMMON Dummy			-0.0005 (0.0031)	-0.0006 (0.0011)
Constant	0.304*** (0.0260)	0.281*** (0.0162)	0.305*** (0.112)	0.298*** (0.0338)
Observations	621	621	1242	1242
Standard errors in parentheses. Models in columns 1 and 2 are estimated with fixed effects regression.				
* p<0.10, ** p<0.05, *** p<0.01				

A.2 Bunching

Fig. 5 plots the frequency of proposals measured as a fraction of the *common account*. 23 per cent of all proposals are larger than the size of the *common account* (i.e. the ratio is equal to or below unity). This fraction does not vary substantially across treatments. In the COMMON treatment the share of proposals exceeding the *common account* is 0.22, in the INDIVIDUAL treatment it is 0.23. Therefore, we are confident that our results are not driven by the misunderstanding that proposals must not exceed the *common account*.

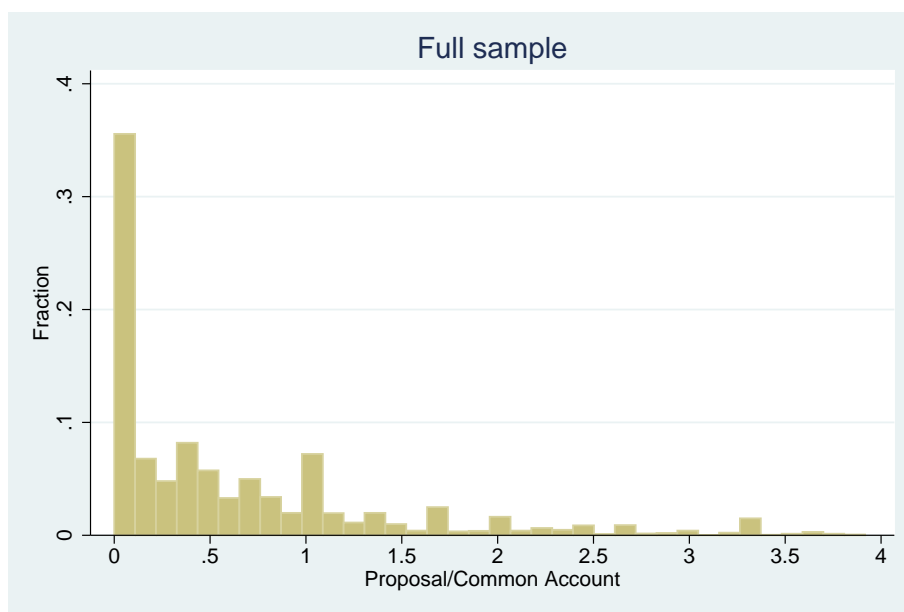


Figure 5: Full Sample.

A.3 Instructions

General instructions

You are about to participate in an economic experiment. This means that in the following you will make decisions that will lead to money payments; money that you and others will receive. Similarly, your final payoff depends also on decisions made by other participants. Please read our instructions carefully. At the end of the experiment you will get paid anonymously.

It is not allowed to communicate during the experiment. If you have any questions, please ask the experimenters. We will help you. Violations of this rule will exclude you from the experiment.

The experiment consists of 24 periods. At the beginning of each period you will be randomly matched in groups of three. It is possible that you will be matched with the same persons more than once. Since neither you nor your partner receive any personal information, you remain anonymous.

There are two types of players: GREEN and BLUE. Each group consists of two GREEN players and one BLUE player. At the beginning of each period your type will be determined randomly. Therefore, it is possible that you are a GREEN or a BLUE player several rounds in a row.

During the experiment, the currency is points. Therefore, all information on income will be in points. At the end of the experiment, we will convert all points on your individual account to Euro. 30 points equal 1 Euro.

Procedure

Every player has an individual account. Moreover, there is a common account for GREEN players (common account GREEN). At the beginning of each period every GREEN player is endowed with a random number of points. Additionally, the GREEN players obtain a random number on the common account. The BLUE players do not get any amount to their individual accounts.

[If COMMON treatment from period 7 to 15]

The group decides on the amount the BLUE player gets. This amount is financed by the common account GREEN. This is the unique opportunity for player BLUE to obtain points. For this purpose every player makes a proposal. The middle proposal of the three proposals is implemented. That means that the highest and the lowest proposals are ignored.

In the first 6 periods there does **not** exist a common account GREEN, that means that the amount to BLUE is financed by the individual accounts of GREEN in equal shares. From period 7 an endowment of the common account GREEN is determined. The rules of the game will be adjusted slightly after period 15.

[If INDIVIDUAL treatment from period 7 to 15]

The group decides on the amount the BLUE player gets. This amount is financed by the GREEN players' individual accounts in equal shares. This is the unique opportunity for player BLUE to obtain points. For this purpose every player makes a proposal. The middle proposal of the three proposals is imple-

mented. That means that the highest and the lowest proposals are ignored. Thereafter, the total amount on the common account GREEN is split among the GREEN players.

In the first 6 periods there does **not** exist a common account GREEN. From period 7 on, an endowment of the common account GREEN is determined. The rules of the game will be adjusted slightly after period 15.

Procedure of a period

To organize the procedure of a period clearly every period is divided into 6 stages.

Stage 1 It is randomly determined whether you are GREEN or BLUE.

Stage 2 (starting from period 7) GREEN players obtain a random amount to their common account GREEN.

Stage 3 GREEN players obtain a random amount to their individual account. The BLUE player does not obtain an amount, which means that there are 0 points on her account.

Stage 4 The group decides how many points are transferred to the BLUE player. For this purpose all players make anonymous proposals. The proposals are made anonymously. The proposal representing the middle amount of points is implemented which means that the highest and the lowest proposal remain unconsidered.

[If COMMON treatment from period 7 to 15]

Stage 5 The transfer to BLUE is financed by the common account GREEN. If there is a positive amount on the common account GREEN after the transfer, this amount will be transferred to the individual accounts of the GREEN players in equal shares. If there is a negative amount on the common account of GREEN after the transfer, the account will be cleared by transfers from the individual accounts of the GREEN players.

[If INDIVIDUAL treatment from period 7 to 15]

Stage 5 The transfer to BLUE is financed by the individual accounts of the GREEN players. Each GREEN player provides half of the transfer to BLUE. The common account GREEN is split among the GREEN players in equal shares.

Stage 6 On the last stage the account balances of all group members and the individual period income is shown.

If COMMON treatment from period 7 to 15

Example Calculation 1

Account balances

Common account GREEN	20
GREEN I	15
GREEN II	15
BLUE	0

Proposals:

GREEN I: ~~40~~, GREEN II: **14**, BLUE: ~~45~~

New account balances

Common account GREEN	6
GREEN I	15
GREEN II	15
BLUE	14

Closure of common account GREEN:
each GREEN player obtains 3

Final account balances

Common account GREEN	0
GREEN I	18
GREEN II	18
BLUE	14

Example Calculation 2

Account balances

Common account GREEN	10
GREEN I	5
GREEN II	5
BLUE	0

Proposals:

GREEN I: **12**, GREEN II: ~~5~~, BLUE: ~~20~~

New account balances

Common account GREEN	-2
GREEN I	5
GREEN II	5
BLUE	12

Closure of common account GREEN:
each GREEN player provides 1

Final account balances

Common account GREEN	0
GREEN I	4
GREEN II	4
BLUE	12

If INDIVIDUAL treatment from period 7 to 15

Example Calculation 1

Account balances

Common account GREEN	20
GREEN I	15
GREEN II	15
BLUE	0

Proposals:

GREEN I: 40, GREEN II: 14, BLUE: 45

New account balances

Common account GREEN	20
GREEN I	8
GREEN II	8
BLUE	14

Closure of common account GREEN:
each GREEN player obtains 10

Final account balances

Common account GREEN	0
GREEN I	18
GREEN II	18
BLUE	14

Example Calculation 2

Account balances

Common account GREEN	10
GREEN I	5
GREEN II	5
BLUE	0

Proposals:

GREEN I: 12, GREEN II: 5, BLUE: 20

New account balances

Common account GREEN	10
GREEN I	-1
GREEN II	-1
BLUE	12

Closure of common account GREEN:
each GREEN player obtains 5

Final account balances

Common account GREEN	0
GREEN I	4
GREEN II	4
BLUE	12

Stufe 4: Abgabe der Vorschläge

Gemeinschaftskonto GRÜN: 12	Ihr persönliches Konto: 0	Persönliches Konto von Grün: 20
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Sie können nun einen Vorschlag machen, wie viele Punkte Sie bekommen sollen.

Vorschlag:

OK

Stufe 4: Abgabe der Vorschläge

Gemeinschaftskonto GRÜN: 12	Ihr persönliches Konto: 20	Persönliches Konto von BLAU: 0
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Sie können nun einen Vorschlag machen, wie viele Punkte BLAU bekommen soll.

Vorschlag:

OK

Figure 6: Screenshot (stage 4).

A.4 Control tasks

These control tasks were handed out to the participants to check whether they understand the transfer's funding procedure.

Control task 1	Control task 2
Account balances	Account balances
Common account GREEN 30	Common account GREEN 14
GREEN I 12	GREEN I 6
GREEN II 12	GREEN II 6
BLUE 0	BLUE 0
Proposals:	Proposals:
GREEN I: 16, GREEN II: 20, BLUE: 8	GREEN I: 21, GREEN II: 5, BLUE: 18
New account balances	New account balances
Common account GREEN	Common account GREEN
GREEN I	GREEN I
GREEN II	GREEN II
BLUE	BLUE
Closure of common account GREEN:	Closure of common account GREEN:
Final account balances	Final account balances
Common account GREEN 0	Common account GREEN 0
GREEN I	GREEN I
GREEN II	GREEN II
BLUE	BLUE