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1 Measuring the attitude towards a European public
2 budget: A cross-country experiment

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10 **Abstract**

11 We use a multilevel public goods game to investigate attitudes towards national
12 public budgets and a European public budget in six Member States of the Eu-
13 ropean Union: Italy, Germany, France, the Netherlands, Poland, and Portugal.
14 We test to what extent propensities to contribute to public goods differ across
15 countries. Using two efficiency treatments, we also test whether each country
16 group adjusts its contribution when the relative efficiency of the public goods
17 changes. We find no differences across countries in the propensity to contribute
18 to either public budget. Moreover, all country groups level up their contribution
19 to the European public good following an increase in its relative efficiency. We
20 also devise a questionnaire to assess the impact of a sense of identity on con-
21 tribution decisions and to control for the impact of COVID-19 and the current
22 war in Ukraine on country and EU perceptions.

23 *JEL classification:* C90; H41; H61

24 *Keywords:* Multilevel public goods game; public budget; European Union; on-
25 line experiment; efficiency; social dilemma.

26

21 1 Introduction

22 The pandemic crisis and the war in Ukraine represented an unprecedented challenge
23 for the European Union (EU) towards greater cohesion of policies, particularly of
24 political economies, to counterbalance unfavourable shocks. Up to March 2020, the
25 European fiscal policy was guaranteed –with doubtful success– by fiscal rules (i.e., the
26 Stability and Growth Pact) while the European budget was not used as a fiscal policy
27 instrument (e.g., [Caselli and Wingender, 2021](#); [De Grauwe and Ji, 2019](#)). Despite
28 being improperly referred to as its own resources, Member States’ contributions have
29 always been the source of revenue for the European budget, and European-level
30 taxes have not been directly levied on citizens ([Bordignon and Scabrosetti, 2016](#)).
31 In the last four years, being the Stability and Growth Pact *de facto* suspended, the
32 debate has focused on the need to revise it, without modifying the European Treaties
33 because of the long and politically challenging process that the latter would require
34 (e.g., [Blanchard et al., 2021](#); [Maduro et al., 2021](#)). In April 2024, an agreement
35 was reached among European countries for a revision of the Stability and Growth
36 Pact that has left no space for the view asking for flanking fiscal constraints with a
37 European fiscal capacity (i.e., common resources) that should be activated in specific
38 contingencies or for the realisation of common projects that are exceptional in nature
39 (e.g., in the energy sector)([Romanelli et al., 2022](#)).

40 Currently, there is a slight possibility of a reform that would grant European
41 institutions the power to tax, due to the lack of political support from the European
42 Parliament and Member States, along with the prevailing tendencies towards par-
43 ticularism and nationalism that are challenging EU cohesion. However, it appears
44 crucial to understand whether these political tendencies represent citizens’ attitudes
45 towards cooperation between European countries and socio-economic integration. In
46 this study, we use the multilevel public goods game (MLPGG) to assess potential
47 barriers to citizens’ participation in an institution unified at the European level. In
48 the MLPGG, subjects are assigned to a local group and asked how much of their
49 private endowment they would like to contribute to the public good of their local
50 group or to the public good of a global group that contains other local groups in ad-
51 dition to their own ([Blackwell and McKee, 2003](#); [Buchan et al., 2009, 2011](#); [Fellner
52 and Lünser, 2014](#); [Chakravarty and Fonseca, 2017](#); [Gallier et al., 2019](#)).

53 We designed this setup to detect individuals’ preferences toward contributing at
54 a personal cost to the welfare of an overall European community, thereby overcoming
55 potential tendencies to favour their own countries. This setup is obtained employing
56 two main experimental features. The first involves framing the decision as a choice
57 between contributing to the “EU public budget” (i.e., the global one) or the ‘Country
58 public budget” (i.e., the local one). This framing explicitly identifies the contribution

59 to the global good as connected to a European economic institution (as contrasted to
60 the subject's country) to trigger the subjects' association between the contribution
61 choice they make with their attitudes towards an EU-integrated fiscal policy. This
62 association aligns with the fact that the returns from providing the global public good
63 are distributed among participants regardless of their affiliation with their country's
64 local group.

65 The second feature concerns the composition of the local groups. We group
66 participants in local groups based on their country of residence. They are aware that
67 if they decided to contribute to the Country public budget only persons from their
68 own country of residence would benefit from the local public good provision, while
69 if they contributed to the EU public budget also persons from two other European
70 countries (not explicitly revealed) would benefit from the returns of the global public
71 good. To reach participants from different EU countries we run the experiment online
72 using the Prolific.com platform (Palan and Schitter, 2018). Due to the limitations of
73 country-specific samples among registered subjects on this platform, we conducted
74 a selection process aimed at maximizing socio-economic, cultural, geographical, and
75 historical diversity. For this purpose, we selected six countries among EU Member
76 States: Italy, Germany, France, the Netherlands, Poland, and Portugal, following a
77 similar approach to Buchan et al. (2009, 2011).

78 The selected countries differ in their roles in the EU unification process. Italy,
79 Germany, and France are founding members and the largest economies in the EU.
80 They also vary in their positions on macroeconomic policies within the EU and have
81 distinct governmental structures, with Germany being the only federal state. The
82 Netherlands is one of the so-called *Frugal Four*, a block of northern countries that is
83 historically the strongest advocate for austerity programs within the EU. Poland is
84 a member of the *Visegrád Group*, a group of four countries in Eastern Europe that
85 joined the EU in 2004 and have disagreed with other EU countries on several topics
86 in the last decade. Finally, Portugal is one of the so-called *PIGS*, a group of Southern
87 European countries characterised by high public debt that has been subject to strong
88 economic and political pressure since the 2008 economic crisis. Moreover, France,
89 Germany, Italy, and the Netherlands are net contributors to the EU budget, while
90 Poland and Portugal are net receivers.

91 This design allows us to investigate potential differences across countries in the
92 propensity to financially cooperate at the EU level. By identifying themselves with
93 the group of fellow citizens forming their local group subjects' contribution can vary
94 based on the different country-specific group identities involved. The MLPGG lit-
95 erature highlights that when group identity is primed in the local groups, it drives
96 some degree of in-group favouritism that motivates contributions to the local group.
97 Priming group identity is attained through different kinds of manipulations but typ-

98 ically involves how the local groups are formed, in line with the minimal identity
99 approach (Fellner and Lünser, 2014; Blackwell and McKee, 2003; Chakravarty and
100 Fonseca, 2017; Gallier et al., 2019). Accordingly, given the potential activation of
101 group identity in our experiment, we expect that contribution to the Country public
102 good significantly persists and differs across countries driven by cultural, political,
103 and institutional traits that are related to the national identities.

104 We further test these potential differences by varying the efficiency of the EU
105 public budget. Specifically, we vary efficiency between treatments by increasing the
106 marginal per capita return (MPCR) of the European Public Budget. The evidence
107 provided by the literature tends to confirm the hypothesis of a *levelling-up* of contri-
108 bution to the global public good following the improvement of its efficiency. However,
109 this increase of contribution can vary in magnitude and on the source of funds that
110 can either be drawn from the subject’s private account (*marginal crowding in*) or
111 from a decrease in contribution to the local public good (*substitution* effect) (see
112 Catola et al., 2023, for a detailed discussion on the differences in results and exper-
113 imental designs). Consequently, the manipulation of the European public budget
114 efficiency can reveal differences concerning the propensity towards levelling-up held
115 by subjects belonging to different country groups.

116 Using a public good design to investigate support for institutions is well-established
117 in the experimental literature (Alberti and Cartwright, 2016; Barrett and Dannen-
118 berg, 2017; Battaglini et al., 2020; Gallier, 2020; Botelho et al., 2022); however, to
119 the best of our knowledge, no study has examined propensities towards strength-
120 ening the European budget through direct contributions. Tax games are usually
121 applied to identify drivers of compliance/evasion to a given tax (Spicer and Becker,
122 1980; Spicer and Hero, 1985; Coricelli et al., 2010; Bazart and Bonein, 2014; Górecki
123 and Letki, 2021). However, they do not seem suited to our purpose since they deal
124 with the response to exogenously imposed fiscal pressure and not with a voluntary
125 (economic) contribution to an institution that is new and holds spending power in
126 return. Indeed, the acceptability of a fiscal policy depends on the perceived return
127 that subjects expect from the use of the revenues (Thalmann, 2004; Maestre-Andrés
128 et al., 2019, 2021; Drews et al., 2022b,a).

129 The return from a European public budget is uncertain from the point of view of
130 EU citizens and this might explain the lack of coverage of direct survey focused on
131 attitudes towards the fiscal union. Indeed, no Eurobarometer survey – the standard
132 tool used by the European Commission to assess the attitudes of citizens towards
133 EU institutions and policies – has directly addressed this acceptability issue. Only
134 a few studies addressed citizens’ attitudes toward more specific fiscal policies by
135 using non-incentivized surveys experiments based on vignettes. Closer to our study,
136 Franchino and Segatti (2019) investigated the (Italian) public attitudes toward a

137 policy designed to address asynchronous economic fluctuations in the euro-zone.
138 [Bremer et al. \(2023\)](#) investigated the public support toward the pandemic recovery
139 fund (Next Generation EU) in five European countries. [Blesse et al. \(2022\)](#) elicited
140 fiscal policy preferences and judgements on European governance with a sample of
141 MEPs from France, Germany, and Italy.

142 Despite their relevance, these studies lack a measure of actual citizens' prefer-
143 ences. We try to fill this gap by focusing on contribution behaviour in the MLPGG
144 and treating cooperation between country groups as an index of propensity towards
145 a unified European fiscal institution. In this regard, this study is closely related to
146 [Buchan et al. \(2009, 2011\)](#), who use the MLPGG to study the effects of globalisation
147 on the willingness to contribute to national versus international public goods and to
148 [Gallier et al. \(2019\)](#), who assess the willingness to pay for local and regional public
149 goods among Germans living in two different regions. However, two main features
150 distinguish our design from these studies. First, national identity is not only used to
151 prime group identity in local groups but to frame the whole decision context since
152 it relates to a potential sense of belonging to European society. Second, by framing
153 the decision as an alternative between two different public budgets, subjects are con-
154 fronted with two labels that may represent the actual institutions to which they act
155 as citizens, thus adding realism to the decision at stake. We completed our study
156 by administering at the end of the experiment a questionnaire aimed at eliciting
157 subjects' personal sense of belonging to national and European institutions, and also
158 personal evaluations about the most recent crises calling for an EU response.

159 The rest of the paper is organised as follows. [Section 2](#) introduces the MLPGG,
160 describes our treatments and provides details on the employed procedures. [Section 3](#)
161 describes our sample. [Section 4](#) presents our experimental results. [Section 5](#), while
162 discussing the results, concludes the paper.

163 **2 The experiment**

164 **2.1 The Multilevel Public Goods Game and treatments**

165 In the main task of our experiment, we ask participants to play a one-shot linear
166 MLPGG. This game is characterised by a nested structure where two or more local
167 groups are part of a higher-level global group. [Figure 1](#) depicts the specific configu-
168 ration we employ in our experiment.

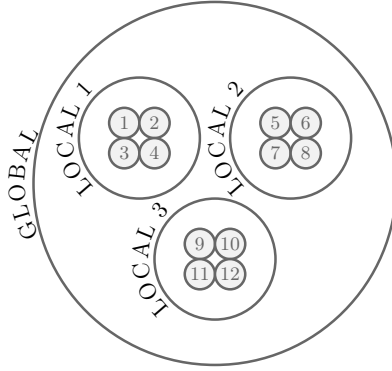


Figure 1: Configuration of our MLPGG.

169 Participants are randomly matched in local groups of $M = 4$ and, at the same time,
 170 in global groups of $N = 12$. Thus, each of the global groups is composed of 3 local
 171 groups. In more detail, in our setup, each participant is randomly matched with
 172 other 3 participants of the same country of residence to form a local group, and also
 173 with 8 other participants from two other local groups, each composed of residents
 174 from one of the other 5 EU countries, to form the global group. Therefore, each
 175 global group is formed by 3 local groups, each being homogeneous in terms of the
 176 country of residence.

177 Participants are informed about the matching protocol; thus, they are aware that
 178 their group was homogeneous with respect to the country of residence and that the
 179 other groups were formed of participants from other countries. However, participants
 180 do not have any other information about the specific countries involved other than
 181 that they also belong to the EU.

182 We opted to frame the experiment both to enhance the connection to the real
 183 world and to help the understanding of the environment and reduce confusion (Alek-
 184 seev et al., 2017). The public goods of the MLPGG were presented to the participants
 185 as, respectively, the Country public budget and the EU public budget. Therefore,
 186 the combination of the information provided to players and the framing of the task
 187 allows us to capture the willingness of players to contribute to either a group of their
 188 fellow citizens or three groups of generic EU citizens.

189 Each individual i receives an endowment e_i , which she can keep for herself in
 190 the private account, contribute to the local public good provided at the local-group
 191 level, or contribute to the global public good provided at the global-group level. We
 192 set each endowment e_i equal to 10 points. Any amount c_i contributed to the local
 193 public good is multiplied by a local-specific factor and divided equally among the
 194 4 local group members. We refer to this ratio as α , the local MPCR. Any amount
 195 C_i contributed to the global public good is multiplied by a global-specific factor and
 196 divided equally among the 12 global group members. We refer to this ratio as β , the

197 global MPCR.¹

198 Given the game structure, the payoff that each player i receives by playing the
 199 game is equal to:

$$\pi_i = e_i - c_i - C_i + \alpha \sum_{j=1}^M c_j + \beta \sum_{k=1}^N C_k. \quad (1)$$

200 In our experiment, we set $\alpha = 0.6$, while the value of β is treatment specific:

201 (i) in treatment *Low*, we set $\beta = \alpha/3 = 0.2$;

202 (ii) in treatment *High*, we set $\beta = \alpha = 0.6$.

203 These two treatments are most commonly used in the literature to investigate whether
 204 and to what extent participants react to variations in the relative efficiency of the
 205 two nested public goods. We measure efficiency in terms of total benefit (TB) which,
 206 following Gallier et al. (2019), is defined as the individual earnings obtained from a
 207 public good when every group member makes a 1-point contribution to it (i.e., αM
 208 and βN , respectively).

209 Table 1 provides a full summary of the relevant parameters for each treatment.

Table 1: Summary of treatments parameters.

Treatment	Local PG			Global PG		
	M	α	TB	N	β	TB
Low	4	0.6	2.4	12	0.2	2.4
High	4	0.6	2.4	12	0.6	7.2

210 In the *Low* treatment, the TBs of the two nested goods are equalised ($\alpha M = \beta N$),
 211 thus sterilising efficiency effects due to scale. Indeed, the local public good is both
 212 less costly and less risky compared to the global one since the individual return from
 213 1 point contributing to it is higher than the return of 1 point contributing to the
 214 global public good. Thus, in the *Low* treatment, players have only a weak incentive
 215 to contribute to the global public good.

216 The *High* treatment corresponds to the case where the MPCRs of the two goods
 217 are equal, i.e., $\alpha = \beta$. Here, the two public goods are equally costly, but the global
 218 public good is more efficient due to scale effects. This, in turn, means that for each
 219 player i , the two goods are equally risky, as the return from contributing is the same
 220 in both cases. Additionally, while in the *Low* treatment, the local group members
 221 are better off if their fellow member i contributes to the local public good rather than
 222 to the global one ($\alpha > \beta$), this is not the case for *High* ($\alpha = \beta$). Hence, contributing
 223 to the local public good in *High* is neither less costly for contributors nor does it
 224 provide higher payoffs for their fellow local group members. Thus, the only monetary

¹It is worth noting that $(1 - \alpha)$ and $(1 - \beta)$ then represent the actual costs that player i incurs by contributing 1 point to the local and to the global public goods, respectively.

225 difference due to contributing to the local public good in *High* vs contributing to
226 it in *Low*, is that of excluding the members of the other two local groups from the
227 benefits of the public good provision.

228 In conclusion, the implementation of these two treatments provides a straight-
229 forward way to test the impact of efficiency on contribution decisions as, from a
230 game-theoretical point of view, in each treatment, one good is better than the other
231 (the local good is better than the global in the *Low* treatment, and *viceversa* in the
232 *High* treatment) given that any strategical trade-off is sterilised.

233 2.2 The post-experimental questionnaire

234 The post-experimental questionnaire includes three sets of questions to assess if the
235 participant has an immigrant background, her feelings of belonging to the country
236 of residence, to Europe, and her (positive or negative) feelings toward the EU, as
237 well as whether these feelings changed following the most recent dramatic events,
238 e.g., the COVID-19 pandemic crisis and the war in Ukraine. Based on the answers
239 to these questions, we define the control variables of our estimation strategy. The
240 numbered list of questions is available in [Appendix A](#). Unless otherwise specified,
241 all the answers are on a 5-point scale.

242 The questionnaire begins with three preliminary questions to assess the possible
243 immigration background of participants. First, we ask about the country of birth of
244 the participant (Q1) to verify if she is a first-generation immigrant. Participants born
245 in the country of residence are considered not to have an immigration background,
246 even if they can be second-generation immigrants. Then, we ask first-generation
247 immigrants how old they were when they moved to the country of residence (Q2)
248 to control for the timing of their immigration. Finally, we ask about the country
249 of birth of the participant's parents (Q3 and Q4) to control the parents belonging
250 to an EU country. In sum, our working hypothesis is that participants' decisions
251 to contribute to the Country and EU budgets can be altered by having recently
252 immigrated to an EU country. To assess feelings towards the country of residence
253 and towards Europe, we ask participants how strongly they identify themselves with
254 the country (e.g., how strongly they feel Italian if Italy is the country of residence)
255 and how strongly they feel they are an EU citizen (Q5 and Q6, respectively). Then,
256 we ask for a personal judgement on the EUs image (Q7).

257 For the COVID-19 questions, we take inspiration from one of the multinational
258 surveys delving into European citizens' attitudes and opinions over the course of the
259 crisis commissioned by the European Parliament and conducted at the end of April
260 2020 ([European Parliament, 2020](#)). We ask participants' opinions about the benefit
261 for their country of being part of the EU before the pandemic (Q8), if they are
262 satisfied with the solidarity between the EU Member States in fighting the pandemic

263 (Q9), and if their opinion about the benefits of being part of the EU changed after
264 the pandemic (Q10).

265 Concerning the war in Ukraine, the main aim is to control participants' propensity
266 to contribute to national and EU defence and whether this has been affected by
267 the war. National defence is one of the clearest examples of a public good, and
268 common defence has always been one of the open issues in the European agenda
269 since its foundation in the 1950s. However, it is not granted that every individual
270 looks favourably upon national defence expenditures, as someone may think that not
271 having an army and being neutral makes the country safer than otherwise having
272 an army. To control for this attitude, we first ask participants to assess, on a scale
273 from 0 to 10, how much they agree that higher military spending increases the level
274 of safety (Q11). Then, we ask whether, after the beginning of the war, they were
275 in favour of higher military expenses in their country (Q12) and whether they were
276 in favour of financing a European army before the beginning of the war (Q13) and
277 after the beginning of the war (Q14).

278 **2.3 Implementation**

279 The experiment, which was preregistered (AsPredicted number: #89021) and ap-
280 proved by the Ethical Committee of the University of Florence (Italy), was pro-
281 grammed in oTree (Chen et al., 2016) and conducted online between the 19th and
282 20th May 2022. The participants were recruited from the EU adult population of the
283 six selected countries through the Prolific platform (Palan and Schitter, 2018). An
284 overall sample of 1,200 subjects living in the EU (i.e., 600 participants per efficiency
285 treatment, equally distributed between the selected countries) was recruited to par-
286 ticipate in the experiment. Recruitment was based on the country of residence rather
287 than the country of nationality. We considered this criterion more representative of
288 the individual sense of citizenship since civil rights, such as the right to vote and to
289 stand as a candidate in elections to the European Parliament (Article 22(1) TFEU
290 (2008)), are given to residents of the Member State. The sample size was determined
291 by an *a-priori* power analysis expecting a small effect size (Cohen's $d = 0.35$) with
292 $\alpha=0.05$ and power 0.80 for a two-tailed t-test for a between-subjects design.

293 Before starting the experiment, subjects were asked to confirm their current coun-
294 try of residence.² Then, participants had the opportunity to choose whether to com-
295 plete the experiment in English or switch to their national language. Before facing
296 the task, subjects had to answer some control questions to test their comprehension
297 of the decision at stake. The experiment did not start until the participants had

²Out of the 1203 participants joining the study on Prolific, 3 declared not to live anymore in the country of residence for which they were recruited. We granted them a fixed participation fee without making them proceed with the experiment.

298 answered all the questions correctly.

299 The payoffs were expressed in points that were converted to GBP at the rate of
300 1 point = 0.025 GBP at the end of the experiment. Over all the treatments, mean
301 earnings amounted to 1.53 GBP (including a 0.50 GBP fixed participation fee), and
302 the experiment took on average 7 minutes to complete. The average earnings in
303 the experiment corresponded to a 13 GBP hourly compensation, and thus, they
304 were perfectly in line with the salary of a student assistant in the EU (namely,
305 approximately 15 EUR). Additionally, by keeping the game monetary reward much
306 greater than the fixed participation fee, we ensured that the payoffs of the task were
307 salient.

308 **3 Sample Characteristics**

309 **3.1 Demographics**

310 [Table 2](#) reports, separately for each efficiency treatment, summary statistics of demo-
311 graphic characteristics of our sample. The last column reports p-values from either
312 Kruskal–Wallis tests for continuous variables or Fisher’s exact tests for dummy vari-
313 ables.

Table 2: Means (and standard deviations) of participants' characteristics per treatment.

	Low	High	p-value
Age	28.60 (8.99)	28.39 (8.61)	0.606
Female	0.51 (0.50)	0.49 (0.50)	0.729
Student	0.45 (0.50)	0.49 (0.50)	0.183
Socioeconomic status	5.55 (1.52)	5.56 (1.46)	0.883
Secondary education	0.33 (0.47)	0.35 (0.48)	0.428
Undergraduate degree	0.26 (0.44)	0.25 (0.43)	0.791
Graduate and Post-graduate	0.36 (0.48)	0.35 (0.48)	0.763
Migrant	0.16 (0.36)	0.17 (0.38)	0.485
Observations	604	596	

Age is the age of the participant at the time of the study. *Female* is a dummy variable that equals 1 if the participant is female. *Student* is a dummy variable that equals 1 if the participant is a student. *Migrant* is a dummy variable that equals 1 if the participant was not born in the country of residence. *Socioeconomic status* measures the self-reported place occupied by the participant on a ladder representing society going from 1 to 10. *Secondary education* is a dummy variable that equals 1 if the participant holds a high school diploma or equivalent. *Undergraduate degree education* is a dummy variable that equals 1 if the participant holds an undergraduate degree. *Graduate and post-graduate* is a dummy variable that equals 1 if the participant holds a graduate or doctorate degree.

314 Overall, the average age is approximately 29 years old, there is an almost perfect
315 split between females and males, and 16.50% of participants were not born in the
316 same country where they currently reside. Approximately 47% are students. Our
317 sample is, on average, well-educated: 33.91% hold a high school diploma (or equiv-
318 alent), 25.58% an undergraduate degree, and 35.33% (at least) a graduate degree.
319 Based on the participants' self-reported measure, our sample is, on average, in a
320 middle socioeconomic status in all treatments. Finally, it is clear that, on average,
321 our sample is younger, better educated, and has a higher share of students than
322 the average population in each country. While this could represent a limitation for
323 the representativeness of our results, it is also worth mentioning that this sample is
324 more diverse than the samples usually employed in laboratory experiments, being
325 the latter almost 100% students' samples. The diversity of the sample is, actually,
326 one of the advantages of running an online experiment.

327 While descriptive statistics do not present statistically significant differences
328 when comparing treatments, this is not the case when we compare countries. This

329 is not surprising given that there are actual socio-demographic differences across our
 330 selected countries. Moreover, it is not possible to recruit stratified samples through
 331 Prolific, but we were able to at least impose balanced samples with respect to gender.
 332 Table 3 presents the descriptive statistics divided by country in the same manner as
 333 Table 2.

Table 3: Means (and standard deviations) of participants' characteristics per country.

	IT	DE	FR	NL	PL	PT	p-value
Age	28.91 (8.93)	29.9 (9.35)	29.93 (9.66)	27.86 (7.47)	26.49 (8.42)	27.91 (8.41)	0.001
Female	0.50 (0.50)	0.50 (0.50)	0.50 (0.50)	0.50 (0.50)	0.51 (0.50)	0.50 (0.50)	1.000
Student	0.50 (0.50)	0.47 (0.50)	0.35 (0.48)	0.44 (0.50)	0.56 (0.50)	0.51 (0.50)	0.001
Socioeconomic status	5.73 (1.44)	5.61 (1.52)	5.49 (1.51)	5.75 (1.68)	5.24 (1.43)	5.51 (1.30)	0.003
Secondary education	0.45 (0.50)	0.36 (0.48)	0.17 (0.38)	0.33 (0.47)	0.47 (0.50)	0.26 (0.44)	0.001
Undergraduate degree	0.20 (0.40)	0.27 (0.45)	0.17 (0.38)	0.38 (0.49)	0.23 (0.43)	0.28 (0.45)	0.001
Graduate and Post-graduate	0.32 (0.47)	0.29 (0.45)	0.61 (0.49)	0.27 (0.45)	0.21 (0.41)	0.42 (0.49)	0.001
Migrant	0.07 (0.25)	0.29 (0.45)	0.27 (0.44)	0.30 (0.46)	0.01 (0.07)	0.06 (0.25)	0.001
Observations	200	200	200	200	200	200	

Age is the age of the participant at the time of the study. *Female* is a dummy variable that equals 1 if the participant is female. *Student* is a dummy variable that equals 1 if the participant is student. *Migrant* is a dummy variable that equals 1 if the participant was not born in the country of residence. *Socioeconomic status* measures the self-reported place occupied by the participant on a ladder representing all the levels in the society that goes from 1 to 10. *Secondary education* is a dummy variable that equals 1 if the participant holds a high school diploma or equivalent. *Undergraduate degree education* is a dummy variable that equals 1 if the participant holds an undergraduate degree. *Graduate and post-graduate* is a dummy variable that equals 1 if the participant holds a graduate or doctorate degree.

334 It is interesting to note that participants from Germany and France have a higher
 335 average age, but for France, this is explained by a sample with a relatively small
 336 share of students and a substantially higher share of highly educated participants
 337 (approximately 78% of participants hold a university degree, with a remarkable 61%
 338 holding masters degree or higher). It is also worth mentioning how the distribution
 339 of immigrants in the sample is largely uneven. First-generation immigrants comprise
 340 one-third of the samples of Germany, France, and the Netherlands, but comprise a
 341 fairly small share of the samples of Italy, Portugal, and especially Poland.

342 Furthermore, we control whether the randomisation in the treatment allocation
 343 worked well within countries. Our tests reject the hypothesis of any statistically

344 significant differences between demographics in the treatment subsamples for each
 345 country (results of the tests can be found in [Table B.1](#))

346 3.2 The post-experimental questionnaire

347 We now turn to the answers collected through the post-experimental questionnaire.
 348 The following figures present the average answers to each question by country (de-
 349 scriptive statistics by country and the statistical tests can be found in [Appendix C](#)).

350 [Figure G.1](#) depicts the average answers to the questions assessing feelings towards
 351 own country and the EU.

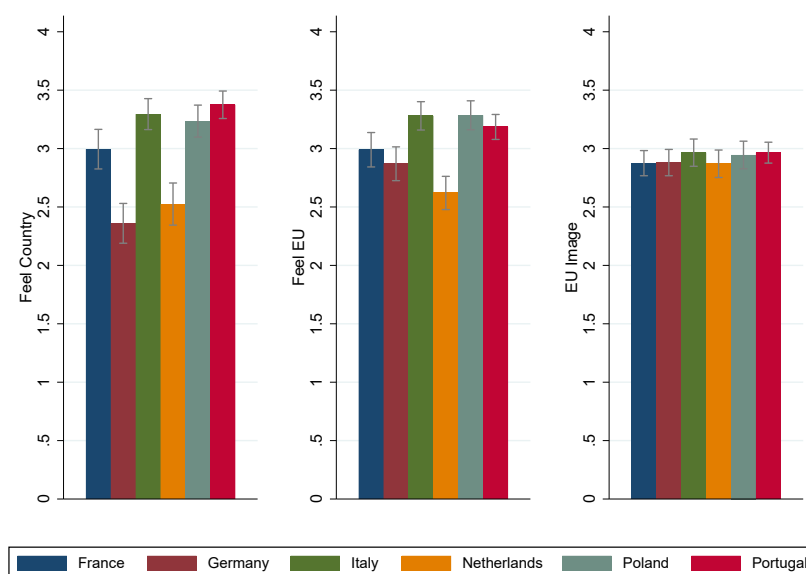


Figure 2: Mean answers to feeling questions by country. Confidence intervals at the 95% level. *Feel Country*: How strongly do you feel (country of origin). *Feel EU*: How strongly do you feel an EU citizen?. *EU Image*: In general, does the EU conjure up for you a very positive, fairly positive, neutral, fairly negative or very negative image?

352 KW tests for *Feeling EU* and *Feeling Country* find significant differences across
 353 countries, while no differences are found for *EU Image*. The pairwise comparisons
 354 between each country show that the differences in *Feeling EU* are driven by weaker
 355 feelings of belonging to the EU among Dutch residents compared to all others, except
 356 for Germany, whose citizens also show a weaker feeling of belonging to the EU
 357 compared to Italy and Poland. Similarly, for *Feeling Country*, German and Dutch
 358 residents show a weaker feeling of belonging to their own countries compared to all
 359 others.³

360 Moreover, as shown in [Figure 3](#), countries display significant differences in the

³Appendix G provides a closer look at the relationship between *Feel Country* and *Feel EU* in terms of correlation and differences.

361 answers to the COVID-related questions. More specifically, Polish residents feel that
 362 their country has benefited from being a member of the EU more than the French,
 363 German, Dutch, and Portuguese residents, and the Dutch and French residents also
 364 reported lower benefits compared to Portuguese and Italian residents. Additionally,
 365 Italians and Portuguese participants display higher levels of satisfaction regarding
 366 the solidarity between the EU Member States in fighting COVID-19 compared to
 367 Dutch and Germans ones, and Portuguese ones also compared to the French and the
 368 Polish participants. These answers reflect the type of event at stake. The COVID-19
 369 pandemic has been a huge symmetric exogenous shock for the euro area and the
 370 world, but with asymmetric impacts across countries both because of the timing of
 371 the spread of the virus and of the differences in underlying economic structures. Ac-
 372 cordingly, starting in 2020, the European Commission adopted measures to support
 373 national economies (i.e., SURE and NGEU) that are differentiated across countries.
 374 Italy was the first country to experience the pandemic, which resulted in a highly
 375 severe impact in terms of lives, and thus was one of the first recipients of European
 376 support.⁴

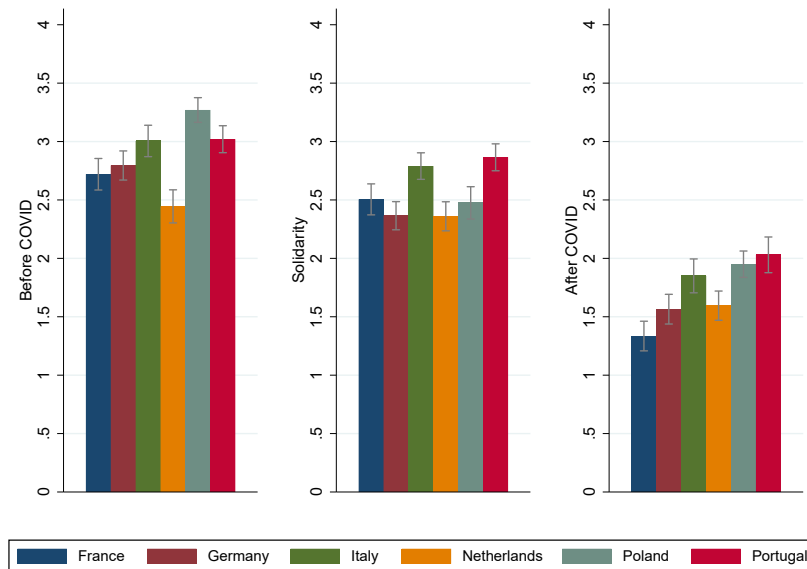


Figure 3: Mean answers to COVID-19 questions by country. Confidence intervals at the 95% level. Before COVID: *Before Coronavirus pandemic, would you say that (country of residence) has on balance benefited from being a member of the EU?*. Solidarity: *How satisfied are you with the solidarity between the EU Member States in fighting the Coronavirus pandemic?*. After COVID: *Has your opinion on the benefits for (country of residence) from being a member of the EU changed after the Coronavirus pandemic?*

⁴In 2021, Italy received slightly less than one-third of the entire SURE funding, while the second recipient is Spain, which received almost one-fourth. For the NGEU program, Italy is expected to receive the equivalent of 11 percent of its GDP, while France and Germany will receive the equivalent of 1.5 and 1 percent of GDP, respectively.

377 Finally, Figure 4 plots the average answers to the questions concerning the war in
 378 Ukraine. We do find some cross-country variability in the answers to the questions.
 379 Particularly, Italian and German residents are less convinced that increasing public
 380 expenditures on national defense makes them safer than Polish and Dutch residents,
 381 and for Italians, this also holds in comparison with Portuguese residents. The Polish
 382 participants also hold a stronger positive belief about military spending compared
 383 to the French ones. For the *National Army*, Polish subjects agree that their country
 384 should increase its public expenditures on the national army after the war's outbreak,
 385 more than any other country in our sample. Italian participants show the lowest
 386 level of adherence to that statement compared to all other countries, except for the
 387 French ones (whose answers to this question are not significantly different). Much less
 388 variation emerges when looking at the answers to the two questions on an EU army,
 389 with German subjects displaying the lowest levels of agreement to the necessity of an
 390 EU army financed by the EU budget, both before and after the Russian-Ukrainian
 391 war.

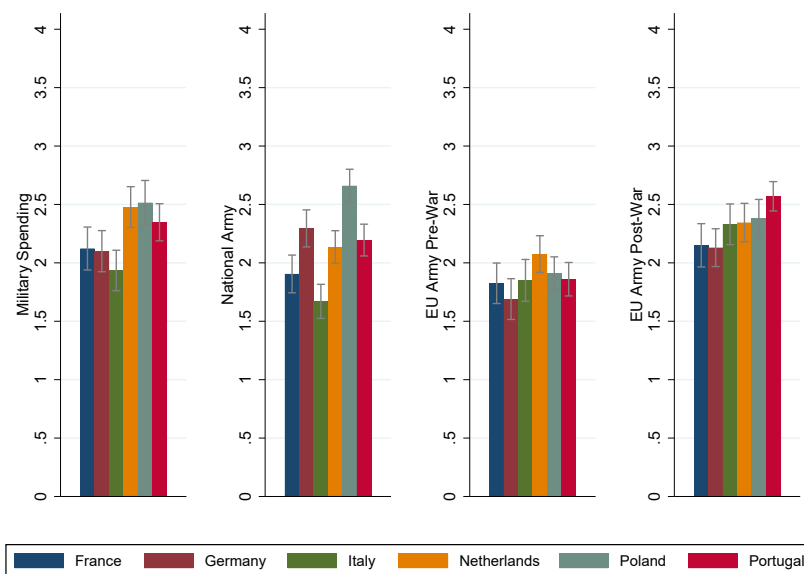


Figure 4: Mean answers to war questions by country. The Military Spending question is standardised to vary between 0 and 5 for graphical comparability. Confidence intervals at the 95% level.
 Military Spending: *Each person has no choice but to consume the service of the national defence. For those who believe increasing public expenditures on national defence makes them safer, an increase in these expenditures is positive. Others think additional expenditures on armies only lead to arms races and decrease national security. Such individuals value additional public expenditures on national defence negatively. On a scale from 0 to 10, how much do you consider belonging to the first group?* National Army: *After the beginning of the Russian-Ukrainian war, do you think your country (of residence) should increase its public expenditures on the army?* EU Army Pre-War: *Before the Russian-Ukrainian war, have you ever thought that the EU should have an army financed with the EU budget?* EU Army Post-War: *After the Russian-Ukrainian war, do you think the EU should get an army and finance it with an EU budget?*

392 **4 Results**

393 In this section, we present our results. We first display some descriptive and nonpara-
 394 metric analyses of the contributing behaviour in all countries. We then investigate
 395 the presence of efficiency-related effects by making use of regressions, which allow us
 396 to control for heterogeneity in participants’ demographic characteristics and individ-
 397 ual preferences and beliefs. Finally, we investigate how identity traits correlate with
 398 contribution decisions.

399 **4.1 Contributing behaviour across countries**

400 [Table 4](#) reports the overall means and standard deviations of contribution decisions
 401 by treatments.

Table 4: Means (and standard deviations) of contribution decisions by treatment.

	Country Budget	EU Budget	Total contribution
Low	4.19 (2.22)	3.24 (2.17)	7.43 (2.54)
High	3.25 (2.09)	4.47 (2.70)	7.72 (2.41)
Total	3.73 (2.21)	3.85 (2.53)	7.58 (2.48)

402 Mean contributions to the Country Budget are 37.30% of the initial endowment
 403 (41.90% in the Low treatment, and 32.50% in the High treatment), and mean contri-
 404 butions to the EU Budget are 38.50% of the initial endowment (32.40% in the Low
 405 treatment, and 44.70% in the High treatment). The first noteworthy fact documented
 406 in [Table 4](#) is that, over all countries, the mean total contribution (i.e., the sum of
 407 contributions to the Country and EU Budgets) is, out of 10 points, approximately
 408 7.43 in the Low treatment and 7.72 in the High treatment. This finding shows that
 409 contribution levels are higher compared to other most recent online one-shot PGGs
 410 that report contributions amounting to 60% of the initial endowment ([van den Berg](#)
 411 [et al., 2020](#); [Catola et al., 2021](#); [Isler et al., 2021](#); [Bilancini et al., 2024](#)), but are in
 412 line with recent one-shot MLPGGs where average total contributions in the game
 413 are approximately 75% of the endowment ([Gallier et al., 2019](#); [Catola et al., 2023](#)).

414 Although this cross-study comparison can only be qualitative in its nature, it
 415 can suggest that the mere addition of a global public good (in our case, the EU one)
 416 compared to a situation where only a local one is provided (in our case, the country
 417 one) can positively impact total contributions (*categorical crowding-in effect*). This
 418 evidence aligns with that found by [Cherry and Dickinson \(2008\)](#), who show that

419 adding the possibility to contribute to a larger number of public goods results in
420 greater total contributions, and by [Chakravarty and Fonseca \(2017\)](#) and [Catola et al.](#)
421 [\(2023\)](#), who obtain the same result in an MLPGG context.

422 As our focus is on behaviour at the country level, in [Figure 5](#) we provide mean
423 contributions by country and treatment for each of the three variables of interest.⁵
424 We test whether the decisions in the MLPGG from different countries come from the
425 same distribution in both efficiency treatments. In the *High* treatment, KW tests do
426 not reject the null hypothesis that contributions to the Country Budget ($\chi^2=8.959$,
427 $p=0.1107$), contributions to the EU Budget ($\chi^2=3.624$, $p=0.6047$), and the Total
428 budget ($\chi^2=3.910$, $p=0.5624$, respectively) come from the same distribution for all
429 the countries considered. This holds for contributions to the EU Budget ($\chi^2=1.334$,
430 $p=0.9314$) and Total contribution ($\chi^2=7.576$, $p=0.1812$) also in the *Low* treatment,
431 while in this condition the only statistically significant difference appears in contri-
432 butions to the Country Budget ($\chi^2=11.433$, $p=0.0434$). To further investigate this
433 evidence, we run a set of pairwise comparisons using Wilcoxon rank-sum tests. They
434 indicate that this result is driven by lower contributions performed by German par-
435 ticipants to their Country Budget compared to the others. However, after applying
436 Bonferroni corrections, no difference remained statistically significant. This analysis
437 leads to our first result.

438 **Result 1:** *Contributions to the Country and EU Budgets, and Total Contribution,*
439 *at each efficiency level, are not significantly different across countries.*

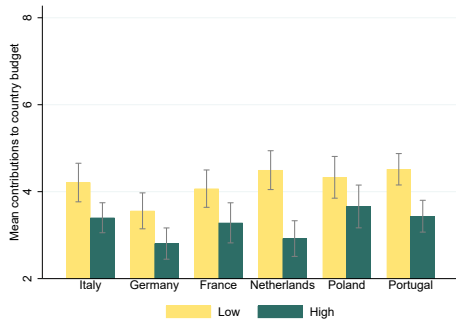
440 4.2 Efficiency-related effects

441 We now turn to investigating the efficiency-related effects. Looking again at [Table 4](#),
442 it appears that mean total contributions do not vary between the *Low* and the *High*
443 treatment, suggesting the marginal crowding-in effect is not at stake. On the other
444 hand, the average contributions to the EU Budget in each country seem relatively
445 higher in the *High* treatment compared to *Low* while contributions to the country
446 budget seem to decrease when switching from *Low* to *High*. This reading allows
447 for hypothesising the presence of both levelling-up and substitution effects while
448 ruling out the marginal crowding-in effect. We test these hypotheses through OLS
449 regressions.⁶

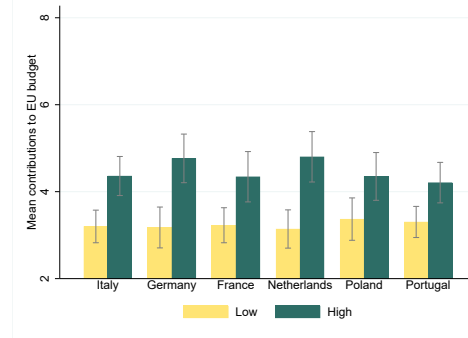
450 With the regressions displayed in [Table 5](#), we aim to estimate the impact of
451 the efficiency manipulation on the contribution to the Country Budget, the EU

⁵Related details about exact mean values and standard deviations can be found in [Table D.1](#) in the Appendix D

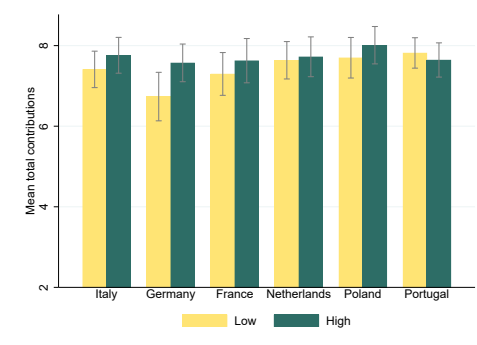
⁶The results are robust to the employment of Tobit models (see [Table F.1](#)). We relied on OLS in the main analysis for comparability with the most recent papers of the MLPGG literature ([Gallier et al., 2019](#); [Catola et al., 2023](#)) as well as in light of new evidence reevaluating the comparison between estimation methods for public good games ([Kent, 2020](#)).



(a) Country Budget



(b) EU Budget



(c) Total contribution

Figure 5: Mean contributions by country and treatment. Confidence intervals at the 95% level.

452 Budget, and the Total contribution. Accordingly, our main independent variable is
 453 the dummy variable High, which is equal to 1 if the observation is from the *High*
 454 treatment and 0 otherwise. We also include country dummies to control for country-
 455 fixed effects, as well as their interactions with the treatment dummy (Columns 1-3).
 456 Finally, we include demographics and answers to the post-experimental questionnaire
 457 as control variables (Columns 4-6).

Table 5: OLS models examining the contribution decisions to the Country Budget (Columns 1, 4), to the EU Budget (Columns 2, 5), and the sum of contributions to both budgets (Columns 3, 6) in the MLPGG.

	(1) Country	(2) EU	(3) Total	(4) Country	(5) EU	(6) Total
High	-1.574*** (0.309)	1.661*** (0.371)	0.086 (0.345)	-1.532*** (0.309)	1.766*** (0.361)	0.233 (0.314)
DE	-0.936** (0.310)	0.035 (0.328)	-0.901* (0.387)	-0.849** (0.316)	-0.117 (0.334)	-0.966* (0.379)
FR	-0.426 (0.316)	0.086 (0.304)	-0.339 (0.359)	-0.466 (0.328)	0.019 (0.315)	-0.447 (0.359)
IT	-0.285 (0.321)	0.059 (0.295)	-0.226 (0.330)	-0.272 (0.341)	-0.300 (0.299)	-0.572 (0.337)
PL	-0.165 (0.334)	0.228 (0.335)	0.063 (0.349)	-0.214 (0.350)	-0.192 (0.346)	-0.406 (0.349)
PT	0.020 (0.293)	0.162 (0.289)	0.182 (0.305)	0.024 (0.302)	-0.130 (0.296)	-0.106 (0.310)
High × DE	0.821* (0.417)	-0.072 (0.525)	0.750 (0.520)	0.765 (0.416)	-0.239 (0.519)	0.527 (0.496)
High × FR	0.788 (0.446)	-0.545 (0.517)	0.243 (0.521)	0.827 (0.445)	-0.621 (0.507)	0.206 (0.499)
High × IT	0.764 (0.421)	-0.501 (0.476)	0.264 (0.473)	0.711 (0.423)	-0.631 (0.458)	0.080 (0.448)
High × PT	0.904 (0.467)	-0.679 (0.527)	0.225 (0.491)	0.855 (0.468)	-0.834 (0.518)	0.021 (0.468)
High × PT	0.495 (0.405)	-0.756 (0.477)	-0.261 (0.451)	0.528 (0.404)	-0.879 (0.475)	-0.351 (0.435)
Age				-0.000 (0.009)	0.003 (0.010)	0.003 (0.009)
Female				0.228 (0.127)	-0.098 (0.145)	0.130 (0.150)
Student				-0.185 (0.148)	0.153 (0.168)	-0.032 (0.173)
Socioeconomic Status				-0.022 (0.044)	0.102* (0.051)	0.081 (0.051)
Education				-0.151* (0.068)	-0.012 (0.075)	-0.164* (0.075)
Migrant				0.176 (0.207)	-0.826*** (0.228)	-0.650*** (0.247)
Feel Country				0.250*** (0.072)	-0.188* (0.078)	0.062 (0.077)
Feel EU				-0.013 (0.083)	0.279** (0.093)	0.265** (0.101)
EU Image				0.230* (0.106)	-0.001 (0.126)	0.229 (0.129)
Before COVID				-0.081 (0.076)	0.285*** (0.086)	0.204* (0.095)
Solidarity				-0.129 (0.080)	0.003 (0.089)	-0.126 (0.090)
After COVID				-0.063 (0.066)	-0.074 (0.073)	-0.137 (0.076)
Military Spending				0.006 (0.035)	-0.076* (0.035)	-0.071 (0.038)
National Army				0.038 (0.081)	0.062 (0.087)	0.100 (0.091)
EU Army Pre-War				0.061 (0.066)	0.041 (0.079)	0.102 (0.082)
EU Army Post-War				-0.084 (0.075)	0.136 (0.086)	0.051 (0.088)
Constant	4.495*** (0.228)	3.141*** (0.224)	7.636*** (0.237)	4.417*** (0.587)	1.690** (0.602)	6.107*** (0.655)
Observations	1200	1200	1200	1200	1200	1200
R^2	0.066	0.064	0.016	0.094	0.121	0.088

Robust standard errors are reported in parentheses. The baseline category for treatment dummies is *Low*. The baseline category for country dummies is NL (=1 when observation is from the Netherlands, and 0 otherwise). *p<0.05, **p<0.01, *** p<0.001

458 Firstly, the positive and significant coefficients of High in (2) and (5) indicate
459 that there is robust evidence of a levelling-up effect. Indeed, subjects are responsive
460 to efficiency concerns since their contribution to the EU Budget is higher when its
461 relative efficiency is higher.

462 **Result 2:** *Contributions to the EU Budget increase on average as its relative effi-*
463 *ciency increases, in all countries.*

464 We also find robust evidence of a substitution effect given the negative and signif-
465 icant coefficients of the treatment variable in the regressions about Country-budget
466 contributions (Columns 1 and 4). Therefore, when the relative efficiency of the
467 Country Budget is lower, subjects contribute less to it.

468 **Result 3:** *Contributions to the Country Budget decrease on average as its relative*
469 *efficiency decreases, in all countries.*

470 Finally, if we consider the total contribution, the effect of the treatment is not
471 statistically significant, thus suggesting that the levelling-up and the substitution
472 effects balance out, leaving Total contribution unchanged.

473 **Result 4:** *There is no statistically significant evidence of an increase in total contri-*
474 *bution due to an increase in the relative efficiency of the EU Budget in all countries.*

475 Overall, these three results are in line with most of the MLPGG literature ([Fellner](#)
476 [and Lünser, 2014](#); [Gallier et al., 2019](#); [Catola et al., 2023](#)). However, when examining
477 the coefficients of our control variables (Columns 4-6), additional insights can be
478 gained regarding how individual characteristics correlate with contribution decisions.
479 The first consideration concerns the status of being a migrant, which on average,
480 drives subjects in such conditions to contribute less to the European budget and to
481 decrease their total contribution. The second consideration regards the significance
482 of the variables measuring the feeling of belonging towards the country or European
483 community, i.e., *Feel Country* and *Feel EU*. As one would have expected, feeling more
484 attached to one’s own country leads subjects to increase their contribution to the
485 Country Budget (to the detriment of contribution to the EU Budget), while feeling
486 more attached to Europe leads them to contribute relatively more to the European
487 budget and also to increase their total contribution. Overall, these considerations
488 point out the relevance of factors connected to one’s sense of identity. We devote the
489 next subsection to analysing these factors.⁷

⁷Further insights on these points can be obtained from [Table E.2](#) in Appendix E, where we perform separate regressions for each country subsample allowing for the exploration of the interactions between being placed in a certain country and the above-mentioned identity-related variables. Moreover, the post-estimation tests in [Table E.1](#) show that the difference in contribution decisions by German participants detected in [Table 5](#) holds only when compared to the Dutch participants.

490 4.3 Attitudes towards the EU community and institutions

491 In this section, we rely on subjects' answers to our post-experimental questionnaire to
492 investigate how their sense of attachment to and judgments on the EU, as compared
493 to their country of residence, correlates with their contribution decisions. We consider
494 three specific aspects: a) the feeling of belonging to the national or EU community,
495 b) the attitude towards national or EU institutions, and c) the status of being a
496 migrant.

497 Concerning the feeling of belonging, we refer to subjects' answers to Q5 and Q6,
498 which explicitly elicit subjective attachment to the national or European communi-
499 ties. More specifically, we divide our sample into three groups depending on whether
500 respondents feel more European, more attached to their own country, or if they are
501 equally attached to both communities. To this end, we construct a variable, *Feelings*,
502 that equals either 0 if the answer to the *Feel Country* question is equal to the answer
503 to the *Feel EU* question; 1 if the answer to the *Feel Country* question is higher than
504 the answer to the *Feel EU*, or 2 in the opposite case. We label the first group as
505 *Neutral*, the second group as *Pro Country*, and the third group as *Pro EU*. This
506 approach treats the feeling of attachment as relative in essence. Indeed, the absolute
507 values of those variables do not reveal *per se* the feeling we are investigating, but
508 their relative comparison and the sign (more than the magnitude) of the pertinent
509 difference.

510 Regarding subjects' attitudes towards a national or European institution, we con-
511 sider how subjects stated their preferences regarding military spending in questions
512 Q12 and Q14.⁸ We consider that – after controlling for the personal attitude towards
513 military spending (asked in question Q11) – by stating their preferences towards fi-
514 nancing a European defense as compared to national defense, subjects are revealing
515 their judgment about the institutions and not only the more effective way to protect
516 themselves. Similar to the previous case, we discriminate between those who show
517 a preference for an EU army or a national army or are indifferent between the two.
518 We, therefore, create a variable, *Defence*, that equals 0 if the answer to National
519 Army is equal to EU Army Post-War, 1 if the answer to National Army is higher
520 than the answer to EU Army Post-War, and 2 otherwise. Again, we label the first
521 group as *Neutral*, the second group as *Pro Country*, and the third group as *Pro EU*.

522 Finally, we analyse the contributing behaviour of the migrants in our sample. The
523 status of being a migrant affects one's sense of belonging to a country and significantly
524 correlates with decisions, as highlighted in the discussion of Table 5. However, this
525 correlation could vary depending on the country of origin. Accordingly, we further
526 develop our analysis by testing whether moving from a country that belongs to the

⁸We chose Q14 focusing on the post-war question for comparison with Q12 which is also stated with a post-war emphasis.

527 EU or not explains migrants' contribution decisions. Hence, we consider a dummy
528 variable, *Migrant EU*, that takes value 1 if the country of origin of the migrant
529 belongs to the EU and 0 otherwise.

530 [Table 6](#) reports the frequencies of each value of each considered variable and
531 reveals a wide variability across countries.

Table 6: Percentage distribution of Feeling, Military and Migrant EU variables, per country.

	FR	DE	IT	NL	PL	PT	Total
<i>Feelings</i>							
Neutral	45%	45.50%	56%	37%	50.50%	61%	49.17%
Pro Country	31%	14%	24%	36%	22.50%	27.50%	25.83%
Pro EU	24%	40.50%	20%	27%	27%	11.50%	25%
<i>Defence</i>							
Neutral	41%	44%	40.50%	38%	44.50%	47%	42.50%
Pro Country	22%	31.50%	9%	21%	33.50%	14.50%	21.92%
Pro EU	37%	24.50%	50.50%	41%	22%	38.50%	35.58%
<i>Migrant EU</i>							
0	71.70%	73.68%	78.57%	60%	100%	69.23%	69.19%
1	28.30%	26.32%	21.43%	40%	0%	30.77%	30.81%

In the Feeling variable, a subject is classified as *Neutral* if $\text{Feel Country} = \text{Feel EU}$, as *Pro Country* if $\text{Feel Country} > \text{Feel EU}$, as *Pro EU* if $\text{Feel Country} < \text{Feel EU}$.

In the Defence variable, a subject is classified as *Neutral* if $\text{Feel Country} = \text{Feel EU}$, as *Pro Country* if $\text{Feel Country} > \text{Feel EU}$, as *Pro EU* if $\text{Feel Country} < \text{Feel EU}$.

Migrant EU is a dummy variable that takes value 1 if the country of birth belongs to the EU and 0 otherwise.

532 [Table 7](#) shows the result of the OLS analysis where we include the *Feelings* and
533 *Defence*.⁹ In terms of feelings, the results show that the subjects that have stronger
534 feelings towards the EU behave in the expected way. Compared to those who are
535 neutral, they contribute relatively less to the Country Budget and relatively more to
536 the EU Budget. Interestingly, the *Pro Country* type behaves differently. Compared
537 to the neutral type, they contribute relatively more to the Country Budget, but they
538 do not contribute less to the EU Budget. An additional dimension worth exploring
539 would be the potential role of the feelings toward the EU or the Country of residence
540 on the sensitivity to the efficiency treatment. This does not seem to be the case for
541 our sample (see [Appendix G](#)). In contrast, the results concerning the preferences
542 towards an EU versus a national (defence) institution are less substantial. Only

⁹Notice that the variables we are considering substitute the variable *Feel Country*, *Feel EU*, *National Army*, *EU Army Pre-War* and *EU Army Post-War* in [Table 5](#). We opted to analyse the impact of the *Feelings* and *Defence* variables in one only regression model. Considering them separately in two regressions produces no differences either in statistical significance or in magnitude. Moreover, we keep the country-fixed effect but not the interaction term between country and treatment, as the focus of our analysis is now different. The reference category for both variables is the *Neutral* group.

543 the group of subjects with a preference for financing their national army shows
544 a statistically significant different behaviour and contributes more to the Country
545 Budget compared to the other two groups.

Table 7: OLS models examining the contribution decisions to the Country Budget, to the EU Budget, and the sum of contributions to both budgets including control variables for *Defence* and *Feeling*.

	(1) Country	(2) EU	(3) Total
High	-0.921*** (0.123)	1.225*** (0.139)	0.304* (0.140)
DE	-0.410 (0.217)	-0.219 (0.260)	-0.630* (0.250)
FR	0.061 (0.232)	-0.296 (0.263)	-0.235 (0.254)
IT	0.228 (0.229)	-0.617* (0.245)	-0.389 (0.235)
PL	0.342 (0.258)	-0.538 (0.280)	-0.196 (0.255)
PT	0.403 (0.222)	-0.515* (0.251)	-0.112 (0.235)
<i>Feel</i> Pro Country	0.320* (0.163)	-0.154 (0.175)	0.167 (0.178)
<i>Feel</i> Pro EU	-0.336* (0.153)	0.533** (0.180)	0.198 (0.177)
<i>Defence</i> Pro EU	0.107 (0.139)	0.134 (0.158)	0.241 (0.157)
<i>Defence</i> Pro Country	0.344* (0.168)	-0.130 (0.190)	0.214 (0.196)
Age	0.001 (0.009)	0.004 (0.009)	0.004 (0.009)
Female	0.206 (0.124)	-0.089 (0.142)	0.117 (0.146)
Student	-0.199 (0.148)	0.162 (0.165)	-0.038 (0.173)
Socioeconomic Status	-0.018 (0.044)	0.103* (0.051)	0.085 (0.051)
Education	-0.161* (0.068)	0.000 (0.075)	-0.160* (0.076)
Migrant	-0.037 (0.186)	-0.868*** (0.208)	-0.905*** (0.227)
EU Image	0.325** (0.100)	0.113 (0.119)	0.438*** (0.123)
Before COVID	-0.089 (0.075)	0.297*** (0.086)	0.208* (0.094)
Solidarity	-0.112 (0.081)	0.019 (0.089)	-0.093 (0.091)
After COVID	-0.053 (0.065)	-0.070 (0.073)	-0.123 (0.076)
Military Spending	0.011 (0.029)	-0.033 (0.031)	-0.022 (0.033)
Constant	4.306*** (0.555)	1.968*** (0.586)	6.274*** (0.636)
Observations	1200	1200	1200
R^2	0.090	0.112	0.072

Robust standard errors are reported in parentheses. The baseline category for treatment dummies is *Low*. The baseline category for country dummies is NL. The baseline category for Feelings and Defence is Neutral. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

546 [Table 8](#) reports the results of an OLS regression where only the migrants are included.

547 We include – in addition to all the regressors of our main analysis – the variable *Age*
548 *of Moving* obtained from question Q2, which replaces *Age*. Indeed, the age of moving
549 to the host country could affect the feelings of identity connected to the status of
550 being a migrant. Moreover, we exclude Poland from this analysis since there is only
551 one migrant in the entire subsample.¹⁰ The results show that migrants who come
552 from another EU country tend to contribute less to the Country Budget compared to
553 migrants who come from a country outside the EU. This is not unexpected since these
554 subjects could maintain stronger ties with their native country because it may be
555 easier for them to move back to their countries (due to lighter regulations and travel
556 expenses) and because (consequently) the decision concerning their permanence in
557 the host country could be felt less definitive. These reasons can potentially explain
558 why this group is less willing than the other group to contribute to a budget that
559 benefits only subjects from their host country. In the same fashion, one could expect
560 that this group would also be more willing to contribute to the EU Budget since such
561 a contribution would benefit participants from their native country. However, this
562 is not the case, as there is no statistically significant difference in the contribution
563 behaviour towards the European Public Budget between the two groups. Finally,
564 it is worth noting how migrants react to the change in the relative efficiency of the
565 European public good by showing only the substitution effect (and not the levelling
566 up). In other words, subjects in the High treatment contribute to the Country
567 Budget less than subjects in the Low treatment; however, they do not contribute
568 more to the EU Budget.

¹⁰The low representation of migrants in Poland on Prolific may be attributed to their intrinsically low proportion within the country. In 2022, migrants accounted for only 2.5% of Poland's population, one of the lowest percentages in the EU (OECD, 2023).

Table 8: OLS models examining the contribution decisions of the subsample of migrants to the Country Budget, to the EU Budget, and the sum of contributions to both budgets.

	(1) Country	(2) EU	(3) Total
High	-1.179*** (0.293)	0.611 (0.346)	-0.568 (0.405)
DE	-0.538 (0.403)	0.467 (0.448)	-0.071 (0.539)
FR	-0.760 (0.422)	0.839 (0.505)	0.079 (0.589)
IT	0.991 (0.525)	0.181 (0.595)	1.171 (0.736)
PT	0.061 (0.686)	1.594 (0.920)	1.654 (0.917)
Migrant EU	-0.793* (0.375)	0.383 (0.490)	-0.410 (0.513)
Age of moving	-0.012 (0.022)	0.025 (0.026)	0.013 (0.026)
Female	0.342 (0.310)	-0.338 (0.367)	0.005 (0.423)
Student	-0.145 (0.303)	0.416 (0.380)	0.272 (0.426)
Socioeconomic Status	-0.071 (0.107)	0.005 (0.139)	-0.066 (0.146)
Education	-0.304 (0.163)	-0.091 (0.211)	-0.395 (0.212)
Feel Country	-0.146 (0.143)	-0.135 (0.193)	-0.281 (0.188)
Feel EU	0.408* (0.175)	0.254 (0.188)	0.662** (0.222)
EU Image	0.211 (0.203)	0.168 (0.278)	0.379 (0.308)
Before COVID	0.151 (0.190)	0.390 (0.219)	0.541 (0.284)
Solidarity	-0.294 (0.223)	-0.215 (0.233)	-0.510 (0.259)
After COVID	0.059 (0.173)	-0.308 (0.198)	-0.249 (0.226)
Military Spending	-0.043 (0.072)	0.002 (0.088)	-0.040 (0.114)
National Army	0.041 (0.199)	0.216 (0.227)	0.257 (0.253)
EU Army Pre-war	0.158 (0.211)	-0.211 (0.211)	-0.053 (0.247)
EU Army Post-War	-0.251 (0.214)	0.259 (0.223)	0.008 (0.249)
Constant	5.382*** (1.321)	0.812 (1.489)	6.194*** (1.491)
Observations	194	194	194
R^2	0.218	0.184	0.205

Robust standard errors are reported in parentheses. The baseline category for treatment dummies is *Low*. The baseline category for country dummies is NL. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

569 5 Discussion and conclusions

570 In this paper, we investigated European citizens' willingness to financially sustain a
571 European public budget compared to the public budget of the country in which they
572 live. For this purpose, we relied on an online multilevel public good game involving

573 a sample of 1,200 participants from six EU Member States. We implemented two
574 treatments that differ with respect to the relative efficiency of the public good rep-
575 resenting the European public budget that is increased across treatments while the
576 efficiency of the country’s public good remains constant. By applying this design, we
577 were able to address two main research questions: a) To what extent do contribution
578 decisions to the two public budgets differ across countries? and b) To what extent
579 do reactions to the increase in the efficiency of the European public budget differ
580 across countries?

581 We do find evidence of a sustained willingness to contribute to the European
582 public budget and a positive response to the increase in its efficiency (*levelling up*
583 *effect*) – which is however not accompanied by an increase in the total contribution
584 (*marginal crowding in*) but by a decrease in the contribution to the country public
585 budget (*substitution effect*). This evidence lets us make a preliminary and provisional
586 point to address the current debate about the opportunity to introduce increasingly
587 stable financial resources to the European budget rather than the current reliance on
588 transfers from the Member States budgets. Overall, European citizens in our sample
589 show a propensity to cooperate at the European level overcoming country-group
590 favouritism (at least in part). In our view, this result constitutes a precondition
591 for potential support for a European institution that is strengthened in its budget
592 capacity, especially if this increased budget capacity translates into higher returns
593 to EU citizens. However, the relevance of this general result must be discussed by
594 referring to some potential limitations of our work.

595 The first limitation is apparent in the lack of evidence for differences across
596 countries for both our research questions. This lack of evidence could in principle
597 reveal a limited power of our analysis to actually grasp such differences rather than
598 the fact that these differences are not at stake. However, it must be noted that
599 our analysis confirms, for each of the considered countries, the main findings in
600 the literature, i.e., the positive contribution to both public goods, the levelling up
601 effect, and the substitution effect. These results seem to confirm the reliability of
602 our analysis to the extent that they can be considered a genuine robust replication
603 of standard phenomena, with no exceptions across our country samples. However, if
604 this is the case, then what we obtain is an actual lack of differences in the propensities
605 of citizens of the selected countries, who appear equally motivated in their support
606 towards an (efficient) European public budget.

607 Another limitation relates to the external validity of our experiment. This lim-
608 itation is due to several factors. Our experiment specifically concerns cooperation
609 across countries as measured by a voluntary contribution. The inference for which
610 the obtained evidence would be representative of support for a policy change and
611 acceptability of direct EU taxation is somehow speculative. However, it can be

612 considered as evidence of a necessary condition for support and acceptability. In
613 other words, if we found no propensity towards cooperation at the European level
614 we could infer low potential for the discussed institutional change. External validity
615 is also limited by the circumstance that the possibility of inferring actual support for
616 contribution to a European public budget is conditioned by the fact that our coun-
617 try samples are only partially representative of all the EU countries and of each of
618 them. As mentioned in [Section 1](#), our selection process was constrained by country-
619 specific samples from registered subjects on the Prolific platform. Nevertheless, our
620 aim was to maximize socio-economic, cultural, geographical, and historical diversity.
621 Moreover, the homogeneity of our results across countries can again be referred to
622 as a basis for a reasonable generalization. Indeed, our selection of Member States
623 embraces quite a large variability at the level of country-level characteristics, and,
624 notwithstanding, citizens express quite an identical contribution behavior. Thus, it
625 appears not too risky to infer that such a behavior can be considered representative
626 of the overall European population. Moreover, the variability of individuals' charac-
627 teristics within our overall sample allowed for a heterogeneity analysis that revealed
628 interesting correlations between contribution decisions and the sense of belonging
629 and trust to institutions by the different categories of subjects that we were able to
630 reach thanks to our online tool.

631 To conclude, our results are limited by the specific setup of our experiment,
632 which we propose as a guiding example for future research in the field of European
633 public finances. For instance, moving to a repeated-interaction setup or eliciting
634 first-order beliefs could provide information on how free-riding might affect contri-
635 bution decisions over time within the national versus European budget framework.
636 Additionally, thanks to our questionnaire we have relevant but limited information
637 about subjects' attitudes and beliefs whose extension could allow for detecting other
638 potential differences across countries. This elicitation would also reveal traits that
639 relate to group identity, which is not manipulated in our design. Manipulating group
640 identity based on these traits would allow for gaining further evidence about how
641 specific identity factors, possibly variant across countries, impact citizens willingness
642 to cooperate within a unified EU institution.

643 **Replication files**

644 The preregistration document and the data and code for replicating the results of
645 this paper are available at [https://osf.io/uvxqw/?view_only=912ec06a385440](https://osf.io/uvxqw/?view_only=912ec06a38544007b9368fe6fd5f6798)
646 [07b9368fe6fd5f6798](https://osf.io/uvxqw/?view_only=912ec06a38544007b9368fe6fd5f6798). All files are licensed under a Creative Commons Attribution
647 4.0 International (CC BY 4.0) license.

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652 **Declaration of Interests**

653 The authors declare that they have no known competing financial interests or per-
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770 Appendices

771 A Questionnaire

772 In this section, we list all the questions included in the post-experimental question-
773 naire. For each question, we also report in parenthesis the name of the corresponding
774 control variable. For all the questions besides Q11 the answer is on a 0-5 scale.

775 Migration

776 **Q 1 (Migrant):** *Were you born in (country of residence)?*

777 **Q 2 (Age of Migration):** *How old were you when you moved to (country of resi-
778 dence)?*

779 **Q 3 (Mother Country):** *In which country was you mother born?*

780 **Q 4 (Father Country):** *In which country was you father born?*

781 Feelings

782 **Q 5 (Feel Country):** *How strongly do you feel (country of residence)?*

783 **Q 6 (Feel EU):** *How strongly do you feel an EU citizen?*

784 **Q 7 (EU Image):** *In general, does the EU conjure up for you a very positive, fairly
785 positive, neutral, fairly negative or very negative image?*

786 COVID-19

787 **Q 8 (Before COVID):** *Before Coronavirus pandemic, would you say that (country
788 of residence) has on balance benefited from being a member of the EU?*

789 **Q 9 (Solidarity):** *How satisfied are you with the solidarity between the EU Member
790 States in fighting the Coronavirus pandemic?*

791 **Q 10 (After COVID):** *Has your opinion on the benefits for (country of residence)
792 from being a member of the EU changed after the Coronavirus pandemic?*

793 War in Ukraine

794 **Q 11 (Military Spending):** *Each person has no choice but to consume the service
795 of the national defence. For those who believe increasing public expenditures on
796 national defence makes them safer, an increase in these expenditures is positive.
797 Others think additional expenditures on armies only lead to arms races and decrease*

798 *national security. Such individuals value additional public expenditures on national*
799 *defence negatively. On a scale from 0 to 10, how much do you consider belonging to*
800 *the first group?*

801 **Q 12 (National Army):** *After the beginning of the Russian-Ukrainian war, do you*
802 *think your country (of residence) should increase its public expenditures on the army?*

803 **Q 13 (EU Army Pre-War):** *Before the Russian-Ukrainian war, have you ever*
804 *thought that the EU should have an army financed with the EU budget?*

805 **Q 14 (EU Army Post-War):** *After the Russian-Ukrainian war, do you think the*
806 *EU should get an army and finance it with an EU budget?*

807 **B Demographic Characteristics**

Table B.1: Means (and standard deviations) of participants' characteristics per country and treatment.

		Age	Female	Stud.	Socioec. Status	Sec. Ed.	Under grad	Grad. and Postgrad.	Migrant
FR	Low	30.00 (10.23)	0.55 (0.50)	0.32 (0.47)	5.38 (1.46)	0.15 (0.36)	0.20 (0.40)	0.60 (0.49)	0.25 (0.43)
	High	29.83 (9.08)	0.45 (0.50)	0.37 (0.49)	5.60 (1.55)	0.19 (0.39)	0.14 (0.35)	0.62 (0.49)	0.28 (0.45)
	p-value	0.944	0.157	0.554	0.246	0.580	0.348	0.886	0.632
DE	Low	30.45 (9.50)	0.46 (0.50)	0.43 (0.50)	5.73 (1.56)	0.36 (0.48)	0.26 (0.44)	0.27 (0.44)	0.33 (0.47)
	High	29.32 (9.19)	0.54 (0.50)	0.50 (0.50)	5.47 (1.48)	0.37 (0.48)	0.28 (0.44)	0.31 (0.46)	0.23 (0.43)
	p-value	0.283	0.322	0.395	0.195	1.000	0.875	0.643	0.158
IT	Low	28.70 (9.25)	0.50 (0.50)	0.54 (0.50)	5.71 (1.50)	0.43 (0.50)	0.20 (0.40)	0.35 (0.48)	0.08 (0.27)
	High	29.12 (8.64)	0.50 (0.50)	0.45 (0.50)	5.74 (1.37)	0.46 (0.50)	0.21 (0.40)	0.28 (0.45)	0.06 (0.23)
	p-value	0.540	1.000	0.258	0.758	0.776	1.000	0.361	0.783
NL	Low	27.89 (8.06)	0.46 (0.50)	0.43 (0.50)	5.81 (1.66)	0.32 (0.47)	0.37 (0.49)	0.27 (0.45)	0.23 (0.42)
	High	27.83 (6.86)	0.53 (0.50)	0.45 (0.50)	5.68 (1.71)	0.33 (0.47)	0.39 (0.50)	0.27 (0.44)	0.37 (0.48)
	p-value	0.832	0.396	0.888	0.653	1.000	0.885	1.000	0.045
PL	Low	26.96 (8.43)	0.54 (0.50)	0.53 (0.50)	5.10 (1.51)	0.43 (0.50)	0.25 (0.44)	0.24 (0.43)	0 (0)
	High	25.98 (8.42)	0.45 (0.50)	0.60 (0.49)	5.38 (1.33)	0.51 (0.50)	0.22 (0.41)	0.19 (0.39)	0.01 (0.10)
	p-value	0.177	0.258	0.394	0.240	0.321	0.618	0.390	0.485
PT	Low	27.59 (7.89)	0.52 (0.50)	0.43 (0.50)	5.54 (1.36)	0.26 (0.44)	0.27 (0.45)	0.40 (0.49)	0.05 (0.22)
	High	28.22 (8.92)	0.50 (0.50)	0.57 (0.50)	5.48 (1.25)	0.26 (0.44)	0.28 (0.45)	0.44 (0.50)	0.79 (0.27)
	p-value	0.943	0.779	0.066	0.691	1.000	1.000	0.670	0.568

Age is the age of the participant at the time of the study. *Female* is a dummy variable that equals 1 if the participant is female. *Student* is a dummy variable that equals 1 if the participant is student. *Migrant* is a dummy variable that equals 1 if the participant was not born in the country of residence. *Socioeconomic status* measures the self-reported place occupied by the participant on a ladder representing society that goes from 1 to 10. *Secondary education* is a dummy variable that equals 1 if the participant holds a high school diploma or equivalent. *Undergraduate* is a dummy variable that equals 1 if the participant holds an undergraduate degree. *Graduate and post-graduate* is a dummy variable that equals 1 if the participant holds a graduate or doctorate degree.

808 **C** Answers to the Post-Experimental Questionnaire

Table C.1: Means (and standard deviations) answers to the post-experimental questionnaire by country.

	France	Germany	Italy	Netherlands	Poland	Portugal
Feel Country	3.00 (1.22)	2.36 (1.23)	3.29 (0.96)	2.52 (1.30)	3.23 (0.99)	3.38 (0.85)
Feel EU	2.99 (1.06)	2.87 (1.04)	3.28 (0.87)	2.62 (1.03)	3.29 (0.89)	3.19 (0.77)
EU Image	2.88 (0.78)	2.88 (0.81)	2.96 (0.84)	2.87 (0.85)	2.94 (0.85)	2.96 (0.64)
Before COVID	2.72 (0.97)	2.79 (0.90)	3.00 (0.97)	2.44 (1.02)	3.27 (0.76)	3.02 (0.83)
Solidarity	2.50 (0.96)	2.37 (0.87)	2.79 (0.82)	2.36 (0.90)	2.48 (1.00)	2.87 (0.83)
After COVID	1.33 (0.91)	1.56 (0.92)	1.85 (1.05)	1.59 (0.90)	1.95 (0.81)	2.03 (1.10)
Military Spending	4.25 (2.65)	4.20 (2.54)	3.87 (2.49)	4.96 (2.52)	5.03 (2.74)	4.70 (2.29)
National Army	1.91 (1.16)	2.29 (1.14)	1.67 (1.05)	2.13 (1.01)	2.66 (1.02)	2.19 (0.98)
EU Army Pre-War	1.82 (1.25)	1.69 (1.26)	1.85 (1.29)	2.08 (1.13)	1.91 (1.02)	1.86 (1.03)
EU Army Post-War	2.15 (1.34)	2.13 (1.17)	2.33 (1.26)	2.35 (1.18)	2.38 (1.18)	2.57 (0.91)

Table C.2: Kruskal–Wallis tests for the answer to the post-experimental questionnaire.

Variable	χ^2	p
Feel EU	78.968	<0.001
Feel Country	136.374	<0.001
Image EU	4.830	0.4370
Before COVID	96.000	0.001
Solidarity	67.127	<0.001
After COVID	69.788	<0.001
Military Spending	32.916	<0.001
National Army	950148	<0.001
EU Army Pre-War	12.691	0.0265
EU Army Post-War	16.396	0.0058

Table C.3: Wilcoxon rank-sum tests.

Country		Country	z	p-value
Feeling EU				
Germany	vs	Italy	-4.350	p<0.001
Germany	vs	Poland	-4.474	p<0.001
Netherlands	vs	Italy	7.148	p<0.001
Netherlands	vs	France	4.039	p=0.002
Netherlands	vs	Poland	-7.213	p<0.001
Netherlands	vs	Portugal	-5.906	p<0.001
Feeling Country				
Germany	vs	Italy	-8.215	p<0.001
Germany	vs	France	5.622	p<0.001
Germany	vs	Poland	-8.882	p<0.001
Germany	vs	Portugal	-4.474	p<0.001
Netherlands	vs	Italy	6.557	p<0.001
Netherlands	vs	France	4.131	p<0.001
Netherlands	vs	Poland	-5.992	p<0.001
Netherlands	vs	Portugal	-7.161	p<0.001
Before COVID				
Poland	vs	France	-5.998	p<0.001
Poland	vs	Germany	-5.596	p<0.001
Poland	vs	Netherlands	-8.337	p<0.001
Poland	vs	Portugal	3.245	p<0.001
Portugal	vs	France	-3.222	p=0.020
Portugal	vs	Netherlands	-6.054	p<0.001
Italy	vs	Netherlands	5.912	p<0.001
Italy	vs	France	-3.359	p=0.012
Solidarity				
Italy	vs	Germany	-5.033	p<0.001
Italy	vs	Netherlands	4.920	p<0.001
Portugal	vs	Germany	-6.468	p<0.001
Portugal	vs	France	-4.226	p<0.001
Portugal	vs	Netherlands	-6.309	p<0.001
Portugal	vs	Poland	-4.304	p<0.001
Military Spending				
Germany	vs	Poland	-3.066	p=0.033
Germany	vs	Netherlands	-3.005	p=0.044
Italy	vs	Poland	-4.214	p<0.001
Italy	vs	Portugal	-3.471	p=0.008
Italy	vs	Netherlands	-4.191	p<0.001
Poland	vs	France	-3.057	p=0.033
National Army				
Italy	vs	Germany	5.399	p<0.001
Italy	vs	Poland	-8.861	p<0.001
Italy	vs	Portugal	-4.874	p=0.008
Italy	vs	Netherlands	-4.258	p<0.001
Germany	vs	France	-3.387	p=0.011
Germany	vs	Poland	-3.333	p=0.014
Poland	vs	France	-6.563	p<0.001
Poland	vs	Netherlands	-5.333	p<0.001
Poland	vs	Portugal	4.888	p<0.001
EU Army pre-war				
Germany	vs	Netherlands	-3.279	p=0.015
EU Army post-war				
Germany	vs	Portugal	-3.960	p=0.002

We include only the tests that show a statistically significant difference. P-values are corrected for Multiple Hypothesis Testing using Bonferroni correction.

809 **D Contribution Decisions**

Table D.1: Means (and standard deviations) of contribution decisions by treatment and country.

	Country		EU		Total	
	Low	High	Low	High	Low	High
Italy	4.21 (2.26)	3.40 (1.76)	3.20 (1.91)	4.36 (2.29)	7.41 (2.30)	7.76 (2.26)
Germany	3.56 (2.13)	2.81 (1.81)	3.18 (2.42)	4.76 (2.82)	6.73 (3.10)	7.57 (2.36)
France	4.07 (2.20)	3.28 (2.34)	3.23 (2.07)	4.34 (2.93)	7.30 (2.72)	7.63 (2.79)
Netherlands	4.50 (2.26)	2.92 (2.10)	3.14 (2.23)	4.80 (2.97)	7.63 (2.35)	7.72 (2.53)
Poland	4.33 (2.48)	3.66 (2.47)	3.37 (2.52)	4.35 (2.76)	7.70 (2.60)	8.01 (2.33)
Portugal	4.51 (1.83)	3.44 (1.87)	3.30 (1.81)	4.21 (2.38)	7.82 (1.91)	7.64 (2.17)

810 **E OLS Regressions**

Table E.1: Post-estimation equality of coefficients of Table 5

	(1) Country	(2) EU	(3) Total	(4) Country	(5) EU	(6) Total
High	-1.574*** (0.309)	1.661*** (0.371)	0.086 (0.345)	-1.532*** (0.309)	1.766*** (0.361)	0.233 (0.314)
DE	-0.936** (0.310)	0.035 (0.328)	-0.901* (0.387)	-0.849** (0.316)	-0.117 (0.334)	-0.966* (0.379)
FR	-0.426 (0.316)	0.086 (0.304)	-0.339 (0.359)	-0.466 (0.328)	0.019 (0.315)	-0.447 (0.359)
IT	-0.285 (0.321)	0.059 (0.295)	-0.226 (0.330)	-0.272 (0.341)	-0.300 (0.299)	-0.572 (0.337)
PL	-0.165 (0.334)	0.228 (0.335)	0.063 (0.349)	-0.214 (0.350)	-0.192 (0.346)	-0.406 (0.349)
PT	0.020 (0.293)	0.162 (0.289)	0.182 (0.305)	0.024 (0.302)	-0.130 (0.296)	-0.106 (0.310)
High × DE	0.821* (0.417)	-0.072 (0.525)	0.750 (0.520)	0.765 (0.416)	-0.239 (0.519)	0.527 (0.496)
High × FR	0.788 (0.446)	-0.545 (0.517)	0.243 (0.521)	0.827 (0.445)	-0.621 (0.507)	0.206 (0.499)
High × IT	0.764 (0.421)	-0.501 (0.476)	0.264 (0.473)	0.711 (0.423)	-0.631 (0.458)	0.080 (0.448)
High × PL	0.904 (0.467)	-0.679 (0.527)	0.225 (0.491)	0.855 (0.468)	-0.834 (0.518)	0.021 (0.468)
High × PT	0.495 (0.405)	-0.756 (0.477)	-0.261 (0.451)	0.528 (0.404)	-0.879 (0.475)	-0.351 (0.435)
Constant	4.495*** (0.228)	3.141*** (0.224)	7.636*** (0.237)	4.417*** (0.587)	1.690** (0.602)	6.107*** (0.655)
Controls	No	No	No	Yes	Yes	Yes
<i>Tests of coefficients (p-values)</i>						
DE vs. IT	0.0354	0.9388	0.0790	0.5563	0.2738	0.7357
DE vs. FR	0.0933	0.8710	0.1700	0.0786	0.5664	0.3289
DE vs. PL	0.0171	0.5771	0.0161	0.8679	0.7327	0.6376
DE vs. PT	0.0007	0.6743	0.0028	0.3172	0.5152	0.1355
IT vs. FR	0.6551	0.9213	0.7507	0.2313	0.6789	0.2097
IT vs. PL	0.7186	0.5900	0.4023	0.4631	0.5268	0.9152
IT vs. PT	0.2956	0.6967	0.1742	0.1008	0.6090	0.3299
FR vs. PL	0.4273	0.6613	0.2812	0.0602	0.8346	0.1632
FR vs. PT	0.1194	0.7840	0.1166	0.0027	0.9687	0.0210
PL vs. PT	0.5457	0.8307	0.7103	0.4357	0.8387	0.3395
High×DE vs. High×IT	0.8861	0.3688	0.3363	0.7874	0.9823	0.7999
High×DE vs. High×FR	0.9368	0.3607	0.3570	0.8922	0.3989	0.3704
High×DE vs. High×PL	0.8541	0.2502	0.3151	0.7495	0.6604	0.8990
High×DE vs. High×PT	0.3935	0.1524	0.0372	0.6371	0.5534	0.3304
High×IT vs. High×FR	0.9564	0.9245	0.9673	0.8840	0.4577	0.5548
High×IT vs. High×PL	0.7576	0.7094	0.9351	0.9530	0.6742	0.7186
High×IT vs. High×PT	0.4877	0.5462	0.2269	0.4652	0.5832	0.2505
High×FR vs. High×PL	0.8070	0.7961	0.9726	0.8410	0.2498	0.3233
High×FR vs. High×PT	0.4798	0.6523	0.2993	0.5323	0.1788	0.0711
High×PL vs. High×PT	0.3498	0.8729	0.2841	0.4508	0.9251	0.4146
Observations	1200	1200	1200	1200	1200	1200
R ²	0.066	0.064	0.016	0.094	0.121	0.088

Robust standard errors are reported in parentheses. Baseline category for treatment dummies is *Low*. Baseline category for country dummies is NL (=1 when observation is from the Netherlands, and 0 otherwise). *p<0.05, **p<0.01, *** p<0.001

811 **F Robustness Check: Tobit model**

Table F.1: Tobit models examining the contribution decisions to the Country Budget (Columns 1, 4), to the EU Budget (Columns 2, 5), and the sum of contributions to both budgets (Columns 3, 6) in the MLPGG.

	(1) Country	(2) EU	(3) Total	(4) Country	(5) EU	(6) Total
High	-1.843*** (0.368)	1.914*** (0.442)	0.191 (0.514)	-1.801*** (0.366)	2.033*** (0.429)	0.424 (0.472)
DE	-1.115** (0.360)	-0.015 (0.404)	-1.182* (0.544)	-1.012** (0.366)	-0.198 (0.408)	-1.318* (0.533)
FR	-0.479 (0.354)	0.018 (0.370)	-0.469 (0.522)	-0.509 (0.367)	-0.072 (0.381)	-0.673 (0.520)
IT	-0.309 (0.360)	0.063 (0.353)	-0.493 (0.468)	-0.291 (0.384)	-0.396 (0.358)	-1.002* (0.479)
PL	-0.207 (0.378)	0.162 (0.409)	0.197 (0.527)	-0.260 (0.397)	-0.356 (0.422)	-0.485 (0.528)
PT	0.052 (0.323)	0.289 (0.339)	0.124 (0.454)	0.050 (0.335)	-0.087 (0.347)	-0.291 (0.457)
High × DE	1.027* (0.507)	0.018 (0.633)	0.978 (0.754)	0.967 (0.502)	-0.188 (0.621)	0.655 (0.720)
High × FR	0.872 (0.528)	-0.536 (0.617)	0.228 (0.761)	0.915 (0.526)	-0.627 (0.603)	0.127 (0.726)
High × IT	0.972* (0.494)	-0.637 (0.558)	0.261 (0.684)	0.918 (0.492)	-0.790 (0.534)	-0.029 (0.648)
High × PL	1.088* (0.547)	-0.742 (0.630)	0.187 (0.750)	1.052 (0.546)	-0.924 (0.616)	-0.174 (0.713)
High × PT	0.629 (0.471)	-0.949 (0.555)	-0.416 (0.670)	0.675 (0.467)	-1.090* (0.549)	-0.608 (0.643)
Age				-0.000 (0.010)	0.006 (0.011)	0.007 (0.014)
Female				0.303* (0.149)	-0.082 (0.171)	-0.048 (0.215)
Student				-0.213 (0.173)	0.207 (0.197)	-0.042 (0.247)
Socioeconomic Status				-0.021 (0.052)	0.123* (0.061)	0.090 (0.074)
Education				-0.177* (0.080)	-0.012 (0.088)	-0.204 (0.108)
Migrant				0.251 (0.246)	-0.967*** (0.274)	-0.975** (0.338)
Feel Country				0.292*** (0.086)	-0.218* (0.092)	0.079 (0.110)
Feel EU				-0.018 (0.099)	0.348** (0.112)	0.333* (0.141)
EU Image				0.287* (0.127)	-0.013 (0.151)	0.254 (0.185)
Before COVID				-0.112 (0.089)	0.341*** (0.103)	0.342** (0.133)
Solidarity				-0.141 (0.094)	0.017 (0.107)	-0.175 (0.134)
After COVID				-0.045 (0.078)	-0.080 (0.086)	-0.227* (0.110)
Military Spending				0.003 (0.041)	-0.090* (0.043)	-0.108 (0.055)
National Army				0.049 (0.095)	0.075 (0.104)	0.144 (0.133)
EU Army Pre-War				0.070 (0.078)	0.046 (0.093)	0.149 (0.118)
EU Army Post-War				-0.087 (0.087)	0.172 (0.102)	0.056 (0.128)
Constant	4.460*** (0.253)	3.000*** (0.270)	8.286*** (0.350)	4.226*** (0.684)	1.086 (0.725)	6.535*** (0.934)
Observations	1200	1200	1200	1200	1200	1200
Pseudo R^2	0.015	0.014	0.003	0.022	0.028	0.019

Robust standard errors are reported in parentheses. Baseline category for treatment dummies is *Low*. Baseline category for country dummies is NL (=1 when observation is from the Netherlands, and 0 otherwise). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

812 G Correlation between Feel EU and Feel Country

813 In this section, we better explore the relationship between identity variables and
 814 efficiency. Firstly, we look at the relationship between the variables Feel EU and Feel
 815 Country. [Figure G.1](#) reports the correlation coefficients between these two variables,
 816 per country: the variables are positively correlated, even if the strength varies across
 817 countries.

Table G.1: Correlation table between Feel EU and Feel Country by country.

Country	ρ	p
France	0.2185	0.0019
Germany	0.4368	<0.001
Italy	0.3295	<0.001
Netherlands	0.3877	<0.001
Poland	0.2143	0.0023
Portugal	0.5243	<0.001
Full sample	0.3816	<0.001

818 Despite the generally positive correlation, it is worth checking whether at the
 819 individual level there are relevant differences within countries. [Figure G.1](#) shows the
 820 average difference between the two variables per country.

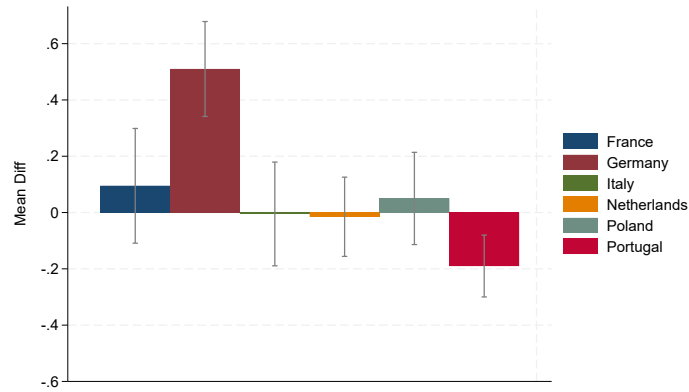


Figure G.1: Mean difference to the answers to feeling questions by country; Feel EU - Feel Country. Confidence intervals at the 95% level.

821 We can see that while for the majority of countries, there is no statistically
 822 significant difference, German subjects show on average a higher feeling of belonging
 823 to the EU, compared to the their country, while the opposite happens for Portuguese
 824 ones.

825 It is also worth checking in detail the specific answers at the individual level. 15
 826 subjects answered with a 0 to both questions and 149 subjects have provided answers
 827 lower or equal to 2 to both questions.

828 **G.1 Feeling of belonging and efficiency**

829 As a next step, we provide a closer look at the identity variables, specifically the
 830 sense of belonging to the own country or to the EU.

831 We again rely on the variable *Feelings* that we built looking at the differences
 832 between *Feel Country* and *Feel EU*. We classify as *Neutral* subjects that provide the
 833 same answer to both questions (*Feel Country* and *Feel EU*). [Table G.2](#) shows the
 834 results. As a robustness check, we also include the regression using the difference
 835 between *Feel EU* and *Feel Country* (labelled *Difference*) and three dummy variables
 836 for each possible realisation of the *Feeling* variable.

Table G.2: Regressions examining the relationship between *feelings* and demographics dimensions.

	(1) Difference	(2) Feelings	(3) Neutral	(4) Pro Country	(5) Pro EU
Migrant	2.370*** (0.233)	0.629*** (0.121)	-0.467** (0.161)	-1.373*** (0.253)	1.461*** (0.167)
Female	0.317 (0.184)	-0.073 (0.091)	0.168 (0.117)	-0.370** (0.136)	0.151 (0.139)
Student	0.054 (0.192)	-0.142 (0.096)	0.228 (0.123)	-0.293* (0.143)	-0.002 (0.145)
Socioeconomic Status	0.000 (0.063)	-0.000 (0.031)	-0.002 (0.040)	0.013 (0.046)	-0.011 (0.047)
Education	-0.198* (0.098)	-0.112* (0.049)	0.127* (0.062)	-0.009 (0.071)	-0.166* (0.073)
Constant	-1.429** (0.500)	0.668** (0.246)	-0.636* (0.318)	-0.616 (0.364)	-0.769* (0.369)
Observations	1200	1200	1200	1200	1200

Robust standard errors are reported in parentheses. Tobit models are used in (1) and (2), Logit models are used in (3)-(5). The baseline category for treatment dummies is *Low*, *Neutral* is a dummy variable assuming value 1 if *Feel EU* = *Feel Country*, *ProCountry* is a dummy variable assuming value 1 if *Feel EU* < *Feel Country* and *ProEU* is a dummy variable assuming value 1 if *Feel EU* > *Feel Country*. The baseline category for country dummies is NL. *p<0.05, **p<0.01, ***p<0.001

837 Results show that being a migrant has a stronger sense of belonging to the EU
 838 compared to the country of residence, while the level of education has a weak opposite
 839 effect. Results are consistent between the different measures.

840 As a second step, we reproduce the same analysis performed in the main text, but
 841 we add an interaction term between the treatment dummy (*High*) and the categorical
 842 variables that capture the sense of belonging (*Feelings*). The aim is to capture whether
 843 different sense of belonging can affect subjects' sensitivity to the efficiency effect.
 844 Results are provided in [Table G.3](#).

Table G.3: Tobit models examining the contribution decisions to the Country Budget, to the EU Budget, and the sum of contributions to both budgets.

	(1) Country	(2) EU	(3) Total
High	-0.991*** (0.172)	1.247*** (0.198)	0.256 (0.198)
<i>Feel</i> Pro Country	0.198 (0.228)	-0.228 (0.214)	-0.031 (0.259)
<i>Feel</i> Pro EU	-0.364 (0.227)	0.667** (0.234)	0.303 (0.246)
High×Pro Country	0.276 (0.313)	0.140 (0.339)	0.416 (0.346)
High×Pro EU	0.030 (0.297)	-0.243 (0.350)	-0.213 (0.340)
DE	-0.400 (0.216)	-0.268 (0.259)	-0.668** (0.251)
FR	0.052 (0.233)	-0.318 (0.263)	-0.266 (0.254)
IT	0.192 (0.231)	-0.603* (0.245)	-0.410 (0.237)
PL	0.352 (0.258)	-0.598* (0.279)	-0.246 (0.257)
PT	0.366 (0.222)	-0.524* (0.251)	-0.157 (0.235)
Age	0.000 (0.009)	0.004 (0.009)	0.005 (0.009)
Female	0.214 (0.124)	-0.106 (0.142)	0.109 (0.145)
Student	-0.194 (0.148)	0.153 (0.166)	-0.040 (0.173)
Socioeconomic Status	-0.016 (0.044)	0.100 (0.051)	0.084 (0.051)
Education	-0.158* (0.068)	0.002 (0.075)	-0.157* (0.076)
Migrant	-0.025 (0.186)	-0.880*** (0.208)	-0.905*** (0.226)
EU Image	0.309** (0.100)	0.121 (0.119)	0.431*** (0.123)
Before COVID	-0.076 (0.076)	0.307*** (0.086)	0.231* (0.095)
Solidarity	-0.114 (0.081)	0.016 (0.089)	-0.098 (0.090)
After COVID	-0.055 (0.065)	-0.068 (0.073)	-0.123 (0.076)
Military spending	0.014 (0.029)	-0.038 (0.031)	-0.024 (0.033)
Constant	4.447*** (0.548)	1.975*** (0.577)	6.422*** (0.640)
<u>Wald test (p-values)</u>			
<i>Feel</i> Pro Country = <i>Feel</i> Pro EU	0.0414	0.0012	0.2584
High× <i>Feel</i> ProCountry = High× <i>Feel</i> ProEU	0.4889	0.3357	0.1127
Observations	1200	1200	1200

Robust standard errors are reported in parentheses. The baseline category for treatment dummies is *Low*. The baseline category for country dummies is NL and for the Feelings variable is *Neutral*. For each column, we also report the p-values of the pairwise Wald tests on the null hypothesis that there is no difference between coefficients of the different Feelings variables. *p<0.05, **p<0.01, ***p<0.001

845 Results are consistent with the main analysis. There is an effect on contribution
846 from the *Feelings* variable. Subjects who are *Pro Country* (i.e., those whose Feel
847 Country > Feel EU) tend to contribute more to the Country budget compared to
848 subjects who are *Pro EU*. It is worth noting that the differences are significant only

849 when comparing the two extremes but not if we compare them to the baseline *Neutral*
850 subjects.

851 Another relevant result concerns the interaction between the *Feeling* and the
852 treatment dummy. Results show that there is not any statistically significant inter-
853 action effect for any comparison. The implication that we derive is that, while both
854 the treatment and the feelings of identification affect the contribution to both public
855 goods, differences in identification do not affect sensitivity to efficiency. Finally, the
856 results are consistent, even for the non-migrant subsample.

857 **H Experimental Instructions**

858 This appendix reports the English instructions we used for the *Low* treatment with
859 Italian residents. The instructions for the *High* treatment and other countries were
860 adapted accordingly and are available upon request.

861

862

Please enter your Prolific ID:

863

864

Please press NEXT to continue.

865

NEXT

866

867

WELCOME!

868

You are about to participate in a research study.

869

Please read and accept the following Consent Form to continue.

CONSENT FORM

This study is conducted in a research project of the University of Florence and the responsible is Prof. Chiara Rapallini (e-mail contact: chiara.rapallini@unifi.it).

Data protection:

All responses you provide will be **anonymous** and treated as **confidential**. Only members of the research team will have access to the collected original data, which will be stored securely on a password-locked computer. The results will be used to write scientific articles and to present in academic forums. In any publication or presentation, information will be provided in such a way that you cannot be identified. Your (anonymous) data may be shared with other researchers or made available in online data repositories.

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Procedures:

The study should take about 5 minutes to complete. Please while taking this study focus on the tasks and avoid any distractions. Also, we kindly ask you to silence your mobile phone and turn off any other device (TV, hi-fi etc.).

Consent statement:

If you do not wish to participate, please close the web-page now.

By clicking on the **AGREE** button below, you acknowledge that:

- You consent to participate in this study, the details of which have been explained to you;
- You understand that your participation in this study is entirely voluntary;
- You have been informed that you are free to withdraw from the study at any time without explanation or prejudice and to withdraw any unprocessed data you have provided;
- The study is for the purpose of research;
- You have been informed that the confidentiality of the information you provide will be safeguarded subject to any legal requirements;
- Any information you provide will be completely anonymous;
- Only members of the research team will have access to your original data, which will be stored on a password-locked computer. Once all identifiable information has been removed, your anonymous responses may be shared with other researchers or made available in online data repositories;
- This consent form will be retained by the researcher.

871

872

AGREE

873

874

You have been selected to take part in this study since you declared on Prolific.co that you are an Italian resident.

Are you still an Italian resident?

Yes No

875

876

NEXT

877

Do you prefer to read the following instructions in Italian or in English?

- Italian English

878

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NEXT

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881

Instructions 1/2

In this study, you will be firstly asked to make a decision. Depending on your decision and on the decisions made by other participants, who face the same decision, you will have the opportunity to get some bonus payments.

After this decision, you will be asked to fill in a short questionnaire. You will receive any bonus payment only after the questionnaire is completed.

All amounts will be expressed in Points rather than pound sterling. The exchange rate is 10 Points = £0.25.

882

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Instructions 2/2

You are randomly assigned to a group of 4 including you and your fellow citizens.

Your group is randomly matched with other two groups of the same size, making up an overall set of 12 participants. Each of these two groups is composed of people belonging to the same country selected from a group of 5 European Union (EU) countries members.

...

886

...

You are given 10 Points and have to decide how much to contribute to your country public budget (the fund of the group with your fellow citizens) and to the EU public budget (the fund of both your group and the other two groups).

- Your **country public budget** yields the following return: the contributions of the 4 participants are added up and the total is multiplied by 2.4. The resulting amount is equally split among the 4 participants.
- The **EU public budget** yields the following return: the contributions of the 12 participants are added up and the total is multiplied by 2.4. The resulting amount is equally split among the 12 participants.

You keep the Points you do not wish to contribute to the two public budgets. Consequently, your bonus payments equal your earnings from your country budget, plus your earnings from the EU public budget, plus the amount you keep for yourself.

887

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NEXT

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Control questions

Please answer the following questions. You will be allowed to go on, only after you correctly respond to both of them.

891

892 **QUESTION 1:** How much do you need to contribute to your country public budget/
893 the EU public budget to earn the highest payoff for you personally if all others con-
894 tribute 0 to your country public budget/ the EU public budget ?

895 10 0 5

896 **QUESTION 2:** How much do you need to contribute to your country public budget/
897 the EU public budget to allow your fellow citizens/ all the participants to earn
898 the highest payoff if all them contribute 10 to your country public budget/ the EU public budget ?

899 10 0 5

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NEXT

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902

YOUR DECISION

903

Please decide how to distribute your 10 Points among the three options (please enter an integer number from 0 to 10, i.e. 0, 1, 2, ..., 9, 10).

904

905

Your contribution to your country public budget:

906

907

Your contribution to the European Union public budget:

908

909

What you keep for yourself:

910

911

Remind: The total amount contributed to your country public budget will be multiplied by 2.4 and divided by 4; The total amount contributed to the European Union public budget will be multiplied by 2.4 and divided by 12.

912

NEXT

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915

And now, just a few questions about you and your opinions. There are no wrong or correct answers. Please answer with honesty.

916

• Were you born in Italy?

917

◦ Yes ◦ No

918

• How old were you when you moved to Italy? *[if "No" to previous question]*

919

• In which country was your mother born?

920

• In which country was your father born?

921

NEXT

922

- 923 • **How strongly do you feel Italian?**
- 924 ◦ Not at all strongly ◦ Not very strongly ◦ Neutral ◦ Fairly strongly ◦ Very
- 925 strongly

- 926 • **How strongly do you feel an EU citizen?**
- 927 ◦ Not at all strongly ◦ Not very strongly ◦ Neutral ◦ Fairly strongly ◦ Very
- 928 strongly

- 929 • **In general, does the EU conjure up for you a very positive, fairly**
- 930 **positive, neutral, fairly negative or very negative image?**
- 931 ◦ Very negative ◦ Fairly negative ◦ Neutral ◦ Fairly positive ◦ Very positive

932

NEXT

933

- 934 • **Before Coronavirus pandemic, would you say that Italy has on bal-**
- 935 **ance benefited from being a member of the EU?**
- 936 ◦ Strongly agree ◦ Agree ◦ Neither agree nor disagree ◦ Disagree ◦ Strongly
- 937 disagree

- 938 • **How satisfied are you with the solidarity between the EU Member**
- 939 **States in fighting the Coronavirus pandemic?**
- 940 ◦ Very satisfied ◦ Fairly satisfied ◦ Not very satisfied ◦ Not at all satisfied
- 941 ◦ Don't know

- 942 • **Has your opinion on the benefits for Italy from being a member of**
- 943 **the EU changed after the Coronavirus pandemic?**
- 944 ◦ Strongly agree ◦ Agree ◦ Neither agree nor disagree ◦ Disagree ◦ Strongly
- 945 disagree

946

NEXT

947

- 948 • **Each person has no choice but to consume the service of the national**
- 949 **defense. For those who believe increasing public expenditures on na-**
- 950 **tional defense makes them safer, an increase in these expenditures is**
- 951 **positive. Others think additional expenditures on armies only lead**
- 952 **to arms races and decrease national security. Such individuals value**

953 additional public expenditures on national defense negatively.
954 On a scale from 0 to 10, how much do you consider belonging to the
955 first group?

956

957 0 1 2 3 4 5 6 7 8 9 10

958 • After the beginning of the Russian-Ukrainian war, do you think your
959 country should increase its public expenditures on the army?

960 Strongly agree Agree Neither agree nor disagree Disagree Strongly
961 disagree

962 • Before the Russian-Ukrainian war, have you ever thought that the
963 EU should have an army financed with the EU budget?

964 Strongly agree Agree Neither agree nor disagree Disagree Strongly
965 disagree

966 • After the Russian-Ukrainian war, do you think the EU should get
967 an army and finance it with an EU budget?

968 Strongly agree Agree Neither agree nor disagree Disagree Strongly
969 disagree

970

[NEXT](#)

971

972

Thank you for participating in this study!

The £0.50 show-up fee and any additional amounts of money you may have earned will be paid to you as soon as possible.

By pressing FINISH you will be redirected to Prolific and prove that you have successfully completed the study.

973

974

[FINISH](#)

975