Civicness drain*

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September 10, 2021

Abstract

Migration may cause not only a brain drain but also a "civicness" drain, leading to a poverty trap. Using migration choices of southern-Italian high-school students classified as Civic if not cheating in a modified die-roll experiment, we uncover a key role of local civicness (average civicness in the class): a civicness drain is observed only at high and low local civicness. We rationalize this pattern with a model in which Civic and Uncivic types balance hope vs. fear of migration outcomes, taking into account economic gains, risk preferences, and their beliefs about being considered Civic in the place of destination.

JEL-Code: J61, C93, R23

Keywords: Emigration, Experiments, Honesty game, Social Capital, Italy

*We gratefully acknowledge financial support from the European University Institute and the Fondazione Cassa di Risparmio di Forlì. We are also grateful to seminar participants at CEPR-ESSLE, EUI, IZA, EWEBE, ASREC Bologna, BEELab, SEET, and IMEBESS, as well as to Barbara Biasi, Israel Eruchimovitch, Roberto Galbiati, Diego Gambetta, Avner Greif, David Levine, Fabrizia Mealli, Claudio Michelacci, Barbara Petrongolo and Enrico Rettore, for very valuable comments and suggestions. This project would not have been possible without the outstanding help in data collection that we received from Lucia Vigna. We also thank Graziella Bonanno, Andrea Cintolesi, Annalisa Landi, Amanda Perillo, Daniela Sposato, Antonella Rita Ferrara, Giovanni Stamato, Lucia Mazzucca and Andrea Arena for valuable research assistance. Authors' email addresses: marco.casari@unibo.it; andrea.ichino@eui.eu; motimich@econ.haifa.ac.il; maria.depaola@unical.it; vincenzo.scoppa@unical.it; ginevra.marandola@ec.europa.eu

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1 Introduction

Imagine a city inhabited by two types of citizens: the Civic, who always pay taxes independently of what the others do, and the Uncivic, who instead pay taxes if and only if the expected penalty for not doing so is high enough. If the fraction of Uncivic is large and they free-ride, then the Civic may decide to migrate elsewhere. At the same time, also the Uncivic may consider migrating depending on how many Civic can be free-rided. For both types, the decision to migrate hinges on the composition of types in the place of origin vs. the place of destination, on their risk attitudes and on their beliefs about what will happen in the place of destination, where detection of uncivic behavior may be more effective and where immigrants believed to be Uncivic (independently of what they really are) may not be well accepted.

The goal of this paper is to study the interaction between civicness and migration decisions and the extent to which this interaction may cause a civicness drain in the place of origin (i.e. a higher probability of emigration for the Civic). Civicness is defined as the willingness to obey mandatory rules concerning contribution to the public good (e.g., paying taxes), even if they are not enforced and are costly to follow. We are motivated by the extensive evidence suggesting the existence of a persistent gap in social capital between nearby localities throughout the world.[1] With specific reference to Italy, which is the context that we study empirically, a difference *between* the North and the South has been widely documented,[2] but what is perhaps less well known is the existence of a substantial variability also across local areas *within* the two macro-regions (the South in particular).[3] While we are of course aware that migration flows out of the South were, and still are, mainly driven

[1] See, for example, Rupasingha, Goets, and Freshwater (2006) for US counties and Braeseman and Stephany (2017) for European regions. Both papers show extensive local heterogeneity for a large set of social capital indicators within US and EU States. Evidence on withing-country differences in honesty around the globe is indirectly provided also by Cohn et al. (2019).

[2] See, for example, Guiso, Sapienza, and Zingales (2004), Durante (2010), Bigoni et al. (2016) or Ichino and Maggi (2000). As customary, the North is defined as including the following northern and central Italian regions: Valle d'Aosta, Piemonte, Lombardia, Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Liguria, Toscana, Emilia-Romagna, Umbria, Lazio and Marche. The South instead includes Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria, Sicilia and Sardegna.

[3] Putnam, Leonardi, and Nanetti (1993) are probably the first to explore systematically the variability of social capital indicators within Italian macro-regions. For a more recent exploration see Buonanno et al. (2015).

by economic concerns, at the margin civicness may have played a role of which we want to understand the relevance.

The general hypothesis that we investigate is that initial differences in the degree of local civicness (as measured by the fraction of Civic types) may induce a civicness drain in some places and not in others. We first explore this hypothesis empirically and then develop a model to explain the collected evidence. The empirical investigation is based on a lab-in-the-field experiment. We selected 33 senior classes in 11 high-schools of Calabria (a southern Italian region). 671 students in these classes were asked to perform a series of assignments, which included a modified version of the "die roll" task in conjunction with some questions about their competence in calculus of probability.[4] The instructions concerning the "die roll" task indicated that students would have received 10 euro upon reporting a six and zero otherwise. An innovative aspect of our experimental design consisted of informing students that whatever remained of the experimental budget after paying them for their *un-monitored declarations* would be donated to their school in the form of educational supplies. Students therefore knew that cheating would subtract resources from the community.[5] This feature of our design captures aspects of civicness that go beyond mere honesty, such as the willingness to follow a mandatory rule to allocate funds within the community thereby resisting the temptation to take a personal advantage by covertly breaking the rule at the expense of others. The same experiment was then replicated in Emilia-Romagna (a northern Italian region), where 394 students of 23 senior classes in 12 high-schools participated in the study.

This setup delivers a deterministic measure of individual civicness for those reporting 1 to 5 (the "Civic" hereafter), while the measure is noisy for those reporting 6 (the "Uncivic" hereafter) because they may have been "lucky civic" or "truly uncivic". Moreover, the

[4]The "die roll" task has been used, for example, by Fischbacher and Foellmi-Heusi (2013), Abeler, Nosenzo, and Raymond (2019), Cohn and Marechal (2018), Dai, Galeotti, and Villeval (2016) and Gachter and Schulz (2016). The latter two papers show, respectively, that cheating in the die-roll task is a good predictor of free-riding on public transportation and of country level indicators of corruption, tax evasion and fraudulent politics.

[5]While this is not the first paper where a third party is affected by lying (see, e.g., the second control treatment in Fischbacher and Foellmi-Heusi (2013) and the series of papers by Uri Gneezy and coauthors, e.g. Gneezy (2005); Gneezy, Rockenbach, and Serra-Garcia (2013)), the novelty in our design is that the "third party" is the individual's community rather than one random and anonymous person. Another paper in which the third party is neither the individual's community nor one random person is Maggian (2019), where the third party is a charity organization.

experiment allows us to measure the average fraction of Civic students in each high-school class, which constitutes the indicator of "local civicness" on which we focus our attention. Considering a population of students has an important advantage for our analysis: their school classmates can arguably be considered as one of the most relevant local communities with which they interact and for which an aggregate measure of civicness can be constructed with our experiment.

As in other studies, also our evidence indicates that the fraction of Civic students is considerably lower in Calabria (49%) than in Emilia-Romagna (71%), which constitutes our *Finding 1*.[6] There is however a substantial overlap between the supports of the distribution of local civicness in each region, with significantly higher variability across classes in the South: while in Calabria local civicness ranges between 6% and 82%, in Emilia-Romagna it goes from 52% to 93% (*Finding 2*). Since in our experiment there is no detection or sanctioning of cheating, we treat this evidence as indicative of the distribution of the true propensity of subjects to be Civic in the different localities. The relatively novel aspect of these first two findings with respect to the existing literature is the emphasis on civic duties (such as providing a truthful tax declaration) rather than on voluntary contributions such as blood donations or engagement in the public sphere.

We then proceed to explore other more novel aspects of the South-North gap that are potentially relevant for the existence of a civicness drain. Adapting to our setting the so called "lost wallet question",[7] we are able to elicit *second order beliefs* of the students from Calabria about what North thinks of southern civicness. Our *Finding 3* is that these beliefs are positively correlated with local civicness (i.e. civicness in the class).

The opportunity to link this information on civicness, on related beliefs and on risk attitudes with information on migration decisions was offered by a follow-up interview, during the fall after graduation, in which students were asked about whether they had decided to

[6]Differences in trust and social capital have already been widely documented for the North and the South of Italy and for Calabria and Emilia-Romagna in particular (see, for example, the literature cited in footnotes 2 and 3). For these two specific regions, results in Braeseman and Stephany (2017) are surprisingly at odds with the existing evidence in other studies and in our data.

[7]See, for example, Sapienza, Toldra-Simats, and Zingales (2013) and Knack (2001). This question refers to the hypothetical situation of losing a wallet and to the probability with which it would be returned. Cohn et al. (2019) did actually run a field experiment checking how often lost wallets are returned around the globe.

stay in Calabria or go elsewhere (for example, but not necessarily, to study or to work). Leaving Calabria to go to North was the choice of 32% of the interviewed students, in line with national statistics which further indicate that this is typically a long term decision (see Istat, 2015a). We were thus able to relate the migration decision of each student to her own civicness and to the average civicness of her high-school class, together with a large set of other indicators related to demographic characteristics, skills, time preferences and family affluence that were generated by other parts of the data collection effort. It is also important to note that our design allows us to study a population (senior high-school students) who is at the first chance of deciding to migrate: for this reason, our evidence speaks about how initial conditions of local civicness may shape migration decisions.

We find strong evidence of a civicness drain at high and low levels of local civicness. However, this is not the case at intermediate values of local civicness. Specifically, we find a U-shaped profile of the probability of migration as a function of local civicness for the Civic and a Hump-shaped profile for the Uncivic. Moreover, the U-shaped profile is more pronounced for the most risk averse among the Civic, while the Hump-shaped profile is more pronounced for the most risk seeking among the Uncivic. Given our limited sample, we support the statistical significance of these conclusions by complementing the conventional analysis based on asymptotic approximations with evidence based on randomization inference (see Imbens and Rubin, 2015), which allows us to assess the uncertainty of our estimates for a fixed sample size.

The positive correlation between risk seeking attitudes and migration (as found both in our data and in the literature) suggests that if the Uncivic are sufficiently more risk seeking than the Civic the two patterns could intersect, originating an uncivicness drain at intermediate values of local civicness. We explore this conjecture eliciting a measure of risk attitudes of the students and we find statistically significant evidence that (self-reported) risk seeking among the Uncivic stochastically dominates risk seeking among the Civic, which is our *Finding 4*. Coherently with this difference in risk attitudes of the two types, we finally find that the U-shaped migration profile of the Civic and the Hump-shaped migration profile of the Uncivic intersect, generating an uncivicness drain in the middle of the distribution of local civicness. This combination of results is summarized in our *fifth* and last *Finding*.

We next propose a model that explains our Findings, and we argue that alternative interpretations based on confounding unobservables are less plausible. The starting point of our explanation is a set of localities in two regions – South and North - in which citizens play a public goods game with mandatory contributions, similar to the game played by our experimental subjects. As suggested by our evidence and by the literature (see footnote 2), we assume that average local civicness is higher in the North (but with variability across localities within the two regions) and that the belief of a southern player to be considered Civic in the North depends on the degree of civicness in her locality of origin. This model predicts that, abstracting from risk attitudes, the general trend would be a civicness drain from the South to the North due to better enforcement of civic behavior in the North, which makes migration more attractive for the Civic. The better enforcement in the North is shown to be an equilibrium result in our model when, as observed in our data and in the existing literature, the North is on average more civic to begin with.

However, if risk attitudes differ between the two types, the general tendency to a civicness drain from the South could be locally attenuated by the interaction between these risk attitudes and the beliefs of southerners about what North thinks of their civicness (independently of the truth – *Finding 3*). Specifically, an Uncivicness drain may be observed at intermediate levels of local civicness, as *Finding 5* suggests, if the Uncivic are more willing than the Civic to take the risk of not being considered Civic in the North. This characteristic (which is our *Finding 4*, holding in our population but not necessarily in others) makes the Uncivic more likely to migrate at those intermediate levels of local civicness at which uncertainty about what North thinks of South is the highest.

The novelty and main contribution of our analysis is to make a first step towards connecting two strands of literature: the one on social capital, with specific reference to the South of Italy, and the one on migration decisions.[8] It is just a first step because a dynamic general equilibrium analysis of the patterns that we uncover is clearly necessary to understand the extent to which these mechanisms may have shaped, in the long run, the

[8]See Banfield (1958), Putnam, Leonardi, and Nanetti (1993), Knack and Keefer (1994), Guiso, Sapienza, and Zingales (2004), Buonanno et al. (2015), Ichino and Maggi (2000) and Bigoni et al. (2016) for the first strand of literature and Todaro (1970), Harris and Todaro (1970), Borjas (1987, 1989) and Dustman and Gorlach (2014) for the second.

current distribution of civicness across different areas of the South of Italy. Such current heterogeneity may be, at least partly, the outcome of the heterogeneous mix of Civic and Uncivic migrants previously leaving each area, a mix that in turn may have been driven by initial differences in the distribution of local civicness.[9]

We describe our experiment and the data in Section 2. The evidence is presented in Section 3. Section 4 shows how our empirical findings can be rationalized in a theoretical model, while Section 5 concludes.

2 The data and the experiment

2.1 Schools and locations

We focus our attention on a population of senior students attending the last year of the Italian high-school tracks dedicated to humanities ("Liceo Classico") and to sciences ("Liceo Scientifico"). These students find themselves at a turning point in their life, when they have to decide if they wish to go to college after matriculation (and where) or if they wish to immediately enter the labor market.[10] Since boarding high-schools are practically absent in Italy, this is also the first real occasion these subjects have to leave home. For the purpose of this study, this population has also the advantage that for each subject we can identify a well defined community of peers in which to measure the degree of local civicness that the subject experiences: this is the high-school class of the student which (differently than in other countries) in Italy typically remains the same for all subjects of studies (none of which is optional) for the entire five years of the curriculum and is thus more relevant, as a group of peers for a student, than the school. Moreover, while the school is chosen by the student, the assignment to a class within a school is constrained by rules determining class size and class assignments (see Angrist, Battistin, and Vuri, 2017 and Ballatore, Fort, and Ichino,

[9] See e.g. Karadja and Prawitz (2019) and Barsbai et al. (2017) for evidence on the effect of migration on the political orientation of those remaining in the community of origin.

[10] According to national statistics for the year 2014, 94% of the students attending a "Liceo classico" go to college, and the same happens for 92% of those attending a "Liceo Scientifico". In our sample, to be described below, about 90% of respondents continue their education towards a college degree. Source: Indagine ISTAT sui Diplomati and "MIUR - Ufficio Statistica e Studi (Department of Statistics of the Ministry of Education)".

2018). Of course, the high-school class is not the only local community to which a student belongs, but it is arguably a very relevant and stable one.

To obtain the necessary information for this kind of population, in January of 2015 we identified 18 eligible "Licei", all public, in the province of Cosenza, which is located in the southern Italian region of Calabria (see Figure A–1 in the Online Appendix). We selected this province for three reasons. First, Calabria, and Cosenza in particular, rank very low in Italy with respect to many proxies of social capital,[11] but, as we will see using our proxy of civicness, there is heterogeneity within the province. Second, Calabria is one of the Italian regions with the highest net overall emigration rate.[12] And third, even though three university campuses are located in the region, offering about the same portfolio of programs in different fields as universities in the North do, the fraction of high-school graduates going to college in the North is the highest among southern regions: 36% according to the Statistics Department of the Italian Ministry of Education, a figure that is close to what we see in our sample where the fraction of emigrants to North is 32%, of which 97% emigrate to study.

We included in the experiment the first 11 schools that answered our invitation to participate in a general research project aimed at investigating the relationship between characteristics of students and university choices. In the Online Appendix we report the letters that we used for contacting the school principals, and Figure A–1 shows where these schools are located. Note in particular that they are on average 46 minutes away by car (according to Google maps) from the closest university (denoted by a star), with a minimum of 14 minutes and a maximum of 97 minutes. Therefore, migration to go to college was not strictly necessary for these students. For each school, we selected three classes randomly (or according to the teachers availability when random selection was not possible). In schools with more than three classes, we decided not to involve all the eligible ones in order to run the experiment simultaneously within the same school, preventing communication between classes, with only three teams of helpers. The average size of the 33 participating classes

[11] Out of 103 provinces, Cosenza ranks 96^{th} in terms of referenda turnout according to Guiso, Sapienza, and Zingales (2004), while it ranks 94^{th} in terms of voluntary associations per 1000 inhabitants and 98^{th} in terms of blood donations per 1000 inhabitants according to Buonanno, Montolio, and Vanin (2009) and Cartocci (2007) respectively.

[12] This rate is equal to 3.58% in 2013 according to Colucci and Gallo (2015) and is second only to that of Campania (3.66%). A similar figure (3.2%) is given by Istat (2015b) for 2015.

was 20.3 (st. dev.: 4.2) with a minimum of 11 and a maximum of 28.[13]

As an indication of how these high-schools compare with the rest of the "licei" in Calabria we use the Index of School Quality developed by the Fondazione Agnelli, which is based on the GPA of the graduates of each school in the first year of college studies. For the 11 schools that we consider the index is equal to 59.3 (st. dev.: 4.9), on a scale from 1 to 100, compared to an average of 57.65 for all the schools in the region. This suggests that there should be no reason to expect the schools included in the sample to be special in any relevant way.

To obtain a comparison benchmark for the North, we replicated this selection procedure in three contiguous provinces, Ravenna, Forlì and Ferrara, located in Emilia-Romagna (see Figure A–1 in the Online Appendix). The reasons to focus on this region of the North are specular with respect to those for Calabria. Emilia-Romagna ranks very high in Italy with respect to many proxies of social capital,[14] but also in this case we observe some within-province heterogeneity using our proxy of civicness, although to a smaller extent than in Calabria. In addition, Emilia-Romagna is the Italian region with the highest net overall immigration rate (+2.7%, according to Colucci and Gallo, 2015). Finally, also this region is scattered with university campuses and, differently from Calabria, it is relatively infrequent that students leave Emilia-Romagna to go to college. According to the the Italian Ministry of Education, this happens only for 19% of high-school graduates, and in our sample this figure is even lower (14%, of which 93% to study; less than 1% in a southern college).

The data collection for Emilia-Romagna took place one year later. In January of 2016 we approached the 16 eligible high-schools of the Ravenna, Forlì and Ferrara provinces, selecting the first 12 that replied to our contact. Figure A–1 in the Online Appendix shows where these schools are located. The average distance of the schools from the closest university (denoted by a star) is similar to what we observe in Calabria: 53 minutes by car (according to

[13]Class size is based on the 83% of students who were present on the day of the experiment. According to Educazione&scuola (1998), 78.3% of southern Italian students enrolled in a "Liceo" attend their high school on an average day. We therefore have no reason to think that the absenteeism we have measured is related to our experimental activity, which if anything seems to have attracted attendance.

[14]Out of 103 provinces, Ravenna, Ferrara and Forlì rank 2^{nd}, 1^{st} and 16^{th}, respectively, in terms of referenda turnout according to Guiso, Sapienza, and Zingales (2004). According to Buonanno, Montolio, and Vanin (2009) they rank and 9^{th}, 29^{th} and 5^{th}, respectively, in terms of voluntary associations per 1000 inhabitants while according to Cartocci (2007) they rank 1^{st}, 12^{th} and 29^{th}, again respectively, in terms of number of blood donations per 1000 inhabitants.

Google maps), with a minimum of 9 minutes and a maximum of 97 minutes. We selected up to two classes in each of them. Class size was on average smaller for the 23 classes of Emilia-Romagna: 17.1 (st. dev.: 4.3) with a minimum of 7 and a maximum of 23.[15] Finally, these 12 schools have a Fondazione Agnelli Index of Quality equal to 79.2 (st. dev.: 6.2) compared to a regional average of 74.21. This difference is statistically significant but quantitatively not too large. Moreover, both these figures are considerably higher than for Calabria.

In the end, 671 students participated in the experiment in Calabria and 394 in Emilia-Romagna. Table A–1 in the Online Appendix contains descriptive information about these students, which was collected with the procedure described in the next section. The experimental procedures are further described in the Online Appendix.

2.2 The experimental tasks

The experiment was run in the classrooms during school hours, taking about 120 minutes to complete, and comprised three incentivized tasks, an ability test and a questionnaire.

The first task was a modified version of the die-roll task (see footnote 4), which we designed to introduce a social dimension of cheating. This is the crucial task for the goals of this paper. The data collection was presented as aimed at studying, in general, the determinants of college choices of high-school students. The framing was thus neutral with respect to the topic that we investigate, i.e., the interaction between civicness and migration.

Students were randomly re-seated in their classroom, after mobile partitions to prevent eye-contact had been installed, and received a plastic cup with a six-sided die, which they were asked to roll inside the cup for six times in order to check that it was fair. They were then asked to report the number drawn in the seventh roll, knowing that they would gain €10 if a 6 was reported and €0 if they reported a number between 1 and 5. The reason for using this binary version is that we wanted to be as certain as possible that those whom we label as Civic are indeed Civic, while at the same time to make sure that we miss as few of them as possible. Participants also knew that the experimenters had allocated a fixed budget

[15] As for Emilia-Romagna, class size is based on the 78% of students who were present on the day of the experiment. According to Educazione&scuola (1998) (see footnote 13), the corresponding average figure for northern student attending a "Liceo" is 93%. Therefore the experiment may have reduced attendance in Emilia-Romagna, although it is not clear what kind of bias in our results this might have caused.

for the school, and that whatever remained of this budget after payments for the task would be transferred to the school in the form of paper for copy machines.[16] Therefore, participants who did not get a 6 faced a trade-off between private earnings they were not eligible for and relevant school resources to which contribution was mandatory but not enforceable. This trade-off is the basis for our proxy of civicness. Unlike the standard die-roll task where the conflict is between private earnings and the experimenter's budget, here the novelty lies in capturing the public good dimension of tax evasion: declaring a 6 after observing a 1-5 outcome is similar to giving a false tax declaration that subtracts resources from the community. For those who get 6, not contributing to the public good is morally acceptable (even if they are civic), because the die roll result defines the shared rule that determines the contributors to the public good and who is legitimately entitled to be exempt.[17]

The remaining tasks were administered for other goals of the overall research project and for this reason they are described in detail in the Online Appendix. Some of them are nevertheless relevant here as well because their outcomes were used to construct control variables for the econometric analysis performed in this paper.

Specifically, we elicited in a non-incentivised way students' risk preferences (on a scale from 0 to 10 in which 0 indicated "no willingness to take risks" and 10 indicated "full availability to take any risk')[18] and their willingness to trust others (using the corresponding question of the World Value Survey). Inter-temporal preferences were instead measured with an incentivized task in which participants had to make six choices, each one between receiving €100 on the day after the session or a larger amount (increasing by €5 at each

[16]Due to funding limitations, this item is typically scarce in Italian schools and students are aware of this. The budget allocated to each school was computed as a fixed amount per student (estimated in a pilot conducted in Bologna, Emilia-Romagna, before the real data collection effort) multiplied by the number of participating students. Thus, actual choices in this task had no influence on the experimental budget. Maggian (2019) reports results from a similar type of experiment in which the leftover from a fixed budget was given to a charity or returned to the experimenter, depending on the treatment.

[17]Students were also asked to answer two questions, one about repetitions in their die draws and one on their understanding of simple probability theory. These questions were added in order to keep the framing of the task as neutral as possible. The second one was also used to construct the measure of intellectual ability score described below in the text. The procedures were carefully designed in order to maximize anonymity and minimize the ability of the experimenters to check if participants had reported the true number. Participants were paid in private at the end of the session in the form of gasoline vouchers. The number of 500-sheets-paper packages that were transferred to schools ranged between 5 and 25.

[18]Self-reported measures of risk attitudes are often used in the literature. See, for example, Dohmen et al. (2011), Dohmen et al. (2017) and Falk et al. (2018). Dohmen et al. (2011) find that self-reported willingness to take risks correlates significantly with risk seeking behavior in the field.

subsequent choice) after four weeks; the impatience level is the number of decisions in which a preference for "€100 immediately' was indicated. A measure of intellectual ability was constructed based on the responses to a test in which students had 15 minutes to answer 8 multiple choice questions (from the PISA questionnaire), combined with the response to a question about probabilities after the die-roll task (see footnote 17), with no monetary incentives. Participants were also asked to answer some questions on their socio-demographic status (specifically on the affluence of their household and on the education of their parents), on their preferences, and on their plans for the future. The answers to these latter questions were used to construct alternative measures of migration, as described in Section 2.3.1.

2.3 The follow-up stage

A follow-up stage was implemented in the fall after graduation (December 2015 and 2016, respectively for Calabria and Emilia-Romagna). Students were contacted by e-mail or by phone to gather information on their current location, on whether they were studying and on where they were seeing themselves living in 10 years. This follow-up took 5-10 minutes of their time. If they could not be reached, we tried to gather information from their parents who were asked by phone to answer a shorter version of the follow up questionnaire.

2.3.1 Measuring migration

We were able to construct a measure of real migration for 648 southern and 353 northern subjects, because 23 students from Calabria (3.4%, of which about half were Civic) and 41 from Emilia-Romagna (10.4%, of which about three quarters were Civic) could not be reached (nor could their parents). This is the migration outcome that we can measure precisely and that we thus want to relate to individual and local civicness. The observed migration status in the fall after graduation is also positively correlated in our data to migration intentions and to more long term and intense preferences concerning where to live, as we show in the Online Appendix and specifically in Tables A–4 and A–5.

2.3.2 Lost wallet questions

We elicited the participants' perception of civicness about Calabria and Emilia-Romagna using two non-incentivized variants of the "lost wallet question" (see footnote 7), which we adapted to our setting with the goal of assessing first and second order beliefs about the relative honesty of people in the North vs. the South of Italy. Specifically, we gathered the first order belief by asking students to imagine that they had lost their wallet and to guess if the probability with which their wallet would be returned in a city of Calabria (Cosenza) was lower, equal or higher than in a city of Emilia-Romagna (Forlì).[19] Then, to obtain the second order belief, participants from Calabria were asked what they thought would be the answer to the same question of a person born in Emilia-Romagna and participants from Emilia-Romagna had to guess what a person from Calabria would have answered.[20]

The information provided by these questions will play an important role in the interpretation of our evidence, although it should be noted that, regrettably, we have answers only from about 35% of the students from Calabria (234 students) and 43% of those from Emilia-Romagna (170 students).

3 Evidence on civicness and migration decisions

Having shown how we collected our data, we next present our main findings.

3.1 Individual and local civicness in the North and in the South

Table 1 reports statistics on individual and local civicness in Calabria and Emilia-Romagna. A student is defined as (certainly) Civic if she does not report a 6 in the die-roll experiment, while local civicness is the fraction of Civic students in her class.

[19] The exact question was: "Imagine you have lost your wallet (which contained 100 euros in cash) while you were walking on the main street of your city of residence. The person who finds it is born in that city and does not personally know you. This person can trace you because there is an ID with your name and address in it. In your opinion what is the likelihood that the person who finds it will return it to you, in the case the city is Cosenza or the city is Forlì?"

[20] The exact question posed to Calabrian students was: "Imagine one poses the same question to a person who was born in Forlì. What do you think would be her answer?" Similarly for Emilia-Romagna students.

Table 1: Individual and local civicness in Calabria and Emilia-Romagna

Participants from →	Calabria	Emilia-Romagna
Fraction of Civic students	0.49	0.71
Distribution of local civicness		
Minimum	0.06	0.52
5^{th} percentile	0.30	0.54
Mean	0.50	0.73
Median	0.48	0.70
95^{th} percentile	0.75	0.92
Maximum	0.82	0.93
Coefficient of variation between classes	0.32	0.17
Log variance between classes	0.21	0.03
Students	671	394
Classes	33	23
Schools	11	12

Notes: The table reports statistics on individual and local civicness based on the die-roll task for Calabria and Emilia-Romagna. A student is defined as Civic if she did not report a 6 in the die-roll task. Students reporting a 6 are not counted as (certainly) Civic in this statistic because they may be Uncivic who in fact got a 1-5 die-roll. Therefore, as a reference, if all students reported the die-roll result truthfully, the entries in the first row of the table would be approximately equal to 0.83 and this would be reported in the table as the fraction of Civic students. On the other hand, if all students getting a die-roll equal to 1-5 reported untruthfully, the fraction of Civic students in the first row of the table would be equal to zero. In the first row the unit of observation is a student. In the rest of the table the unit of observation is a class and local civicness is defined as the fraction of Civic students in each class. The different unit of observation in the two parts of the table explains why the fraction of civic students in the first row differs from the mean of local civicness in the fourth row.

Our first finding is displayed in the first row of the table.

Finding 1 *The Civic are more frequent in the North than in the South*

Specifically, while in Emilia-Romagna 71% of the 394 students can be defined as Civic, the same can be said about only 49% of the 671 students from Calabria, and the difference is statistically significant (p-value of a t-test < 0.0001). The remaining students who reported a 6 may have been lucky Civic or truly Uncivic. Exploiting the Law of Large numbers and the observed proportion of certainly Civic students, we can infer that, of those reporting a 6, $\approx 80\%$ are truly Uncivic in Calabria and $\approx 50\%$ in Emilia-Romagna.[21]

[21]The calculation for Calabria is as follows: For every five Civic getting (and reporting) 1-5, there is one

A potential concern related to *Findings* 1 is that the observed civicness gap between North and South might be due to other characteristics of southern and northern students, in particular family affluence, that are differently distributed in the two populations and that correlate with the probability of being Civic. Table A–8 in the Online Appendix reports marginal effects estimated in a Logit model for the probability that a student is Civic as a function of her region and of the relevant observable covariates at our disposal (these covariates are described in the Online Appendix Table A–1). Being Civic, as measured by the die-roll task, is essentially uncorrelated with almost all covariates, while its correlation with a Calabrian origin is negative, large in size and statistically significant also controlling for observables. Specifically note that, differently than what one might expect if the 10 euro offered in the die-roll task were irrelevant for students coming from more affluent environments, variables capturing family background and individual ability are unrelated to civic behaviour. A notable exception in Table A–8 is represented by risk seeking attitudes, which correlate negatively with individual civicness (p-value: 0.001). In Section 3.4 we will explore this finding in greater detail, discussing its relationship with the patterns of civicness and uncivicness drain documented in Section 3.3.

The rest of Table 1 describes the distribution of local civicness (i.e., the fraction of students not reporting a 6 in each class) across the classes that participated in the study. A non-parametric k-sample test rejects the null hypothesis that the median of local civicness in Calabria is larger or equal to the median for Emilia-Romagna (p-value < 0.0001). More generally, a Wilcoxon-Mann-Whitney test rejects the equality of the two distributions of local civicness for Calabria and Emilia-Romagna (p-value < 0.0001).

In addition to the above differences, Table 1 reveals another divergence between the distributions of local civicness in the two regions, which we summarize in our second finding:

Finding 2 *The supports of the distributions of civicness across localities in Calabria and in Emilia-Romagna overlap and the (log) variance is higher in the southern region.*

The first part of this finding is supported by the observation that local civicness in

lucky Civic getting (and reporting) a 6. So observing $\approx 50\%$ reporting 1-5 (see Table 1) implies $\approx 60\%$ Civic getting 1-6, and the rest (40%) are Uncivic. Then, if $\approx 40\%$ are Uncivic out of $\approx 50\%$ reporting a 6 it follows that $\approx 80\%$ of six-reporters are Uncivic. In an analogous way one can get the fraction for Emilia-Romagna.

Calabria ranges from a minimum of 6% to a maximum of 82% with a coefficient of variation equal to 32%, while in the northern region it ranges between 52% and 93%, with a coefficient of variation of only 17%. The observed minimum in Calabria might appear as an unreliable outlier class, but the 5^{th} percentile of local civicness is in any case considerably smaller in the southern region (30%) than in Emilia-Romagna (54%). As for the second part of *Finding 2*, using the Fligner and Killeen non-parametric test we reject the null hypothesis that the (log) variance of the two distributions is the same with a p-value of 0.0027.

Summing up, our first two findings confirm previous studies cited in footnotes 2 and 3, which find a solid gap in proxies of social capital between the North and the South of Italy together with a considerable dispersion within regions that is larger in the South.

3.2 Belief formation and local civicness

As explained in Section 2.3, we designed our own version of the "lost wallet questions" to elicit the first order belief of students regarding the probability that a lost wallet is returned in the two regions and the second order belief about the same event. The distribution of the answers to these questions is described in Table A–9 of the Online Appendix . In both regions, the majority of subjects expects a lower return rate of the wallet in Calabria than in Emilia-Romagna. This perception from first order beliefs is amplified in the second order beliefs revealed by participants in the two regions. The South is on average pessimistic about the belief of North on the civicness of southern people, actually more pessimistic than what northeners really are. Emilia-Romagna students, instead, expect people in the South to have more optimistic views about the likelihood that the wallet is returned in Calabria.

For the purpose of this paper, however, what is more interesting is the evidence on how second order beliefs of southern students change with the level of local civicness they experience in their class. A scatter plot highlighting the positive raw correlation between these two variables at the class level is displayed in Figure A–5 of the Online Appendix. We also regress the second order beliefs of the 234 students from Calabria for whom we have the answers, on the local civicness of their classes. The coefficient is positive (0.986; s.e.: 0.538) and statistically significant at the 10% level, suggesting that even if southern students are in general pessimistic about what North thinks about South, they become more optimistic

when they live in more Civic communities.[22]

We summarize this evidence in our third finding.

Finding 3 *There is a positive correlation between civicness in a southern locality and the second order belief of subjects in that locality on what North thinks of southern civicness.*

3.3 Civicness and uncivicness drains

We now restrict the analysis to the 648 Calabrian students for whom we know for sure whether they emigrated or not from South to North in the fall after graduation. Denote by $M_{i,j}^{S,\tau} = 1$ the event that student i of type $\tau \in \{c = \text{civic}, u = \text{uncivic}\}$ in class j of region S (South) has emigrated to North, while $M_{i,j}^{S,\tau} = 0$ indicates that she remained in the South.

Table 2: Civicness drain at different levels of local civicness

	ALL classes	Low local civicness $p_j^S \leq 0.4$	Medium local civicness $0.4 < p_j^S \leq 0.58$	High local civicness $0.58 < p_j^S$
Odds ratio of migration	0.99	1.16	0.70	1.17
Observations	648	223	220	205

Notes: The table reports the odds ratios of migration to North of Civic versus Uncivic southern students, as defined in equation (1). Students in all classes are considered in column 1, while students in the lowest, the medium and the highest tercile of the distribution of local civicness (fraction of students reporting 1-5 in a class) are considered in the remaining columns. The division into terciles is such that each tercile is composed of 11 classes out of the total of 33 Calabrian classes.

In Table 2 we report the odds ratio of migration to North of Civic vs. Uncivic students,

$$O^S = \frac{\dfrac{\mathbb{P}(M_{i,j}^{S,c} = 1)}{1 - \mathbb{P}(M_{i,j}^{S,c} = 1)}}{\dfrac{\mathbb{P}(M_{i,j}^{S,u} = 1)}{1 - \mathbb{P}(M_{i,j}^{S,u} = 1)}}. \tag{1}$$

In equation 1, $\mathbb{P}(M_{i,j}^{S,\tau} = 1)$ is the probability that a southern student of type τ migrates to North.

[22] The regression controls for gender, intellectual ability, average intellectual ability in the class, risk seeking, impatience level, trust in others, family income, parental education, urban area, class size, as well as for the identity of the helpers who ran the experiment.

Table 3: Logit estimates of the probability of migration to North

	Civic students	Uncivic students
Local civicness	-1.978**	1.849***
	(0.779)	(0.714)
Local civicness squared	2.107***	-1.990**
	(0.742)	(0.852)
Female	-0.013	0.025
	(0.071)	(0.064)
Intellectual ability	0.009	-0.006
	(0.015)	(0.017)
Risk seeking attitude	0.002	0.008
	(0.017)	(0.017)
Impatience level	-0.009	-0.015
	(0.015)	(0.016)
Trust for others	0.052	0.115
	(0.108)	(0.086)
High family income	0.126	0.178***
	(0.089)	(0.068)
Low family income	-0.030	0.030
	(0.094)	(0.078)
Years of average parental education	0.038***	0.010
	(0.011)	(0.009)
Urban area	-0.299***	-0.282***
	(0.079)	(0.077)
Class size	0.017**	0.002
	(0.008)	(0.007)
Classical high school	0.021	0.177**
	(0.089)	(0.090)
Average class ability	0.073	0.120*
	(0.082)	(0.063)
Peer civic migrants	0.251	0.070
	(0.166)	(0.113)
Peer uncivic migrants	0.636***	0.265
	(0.117)	(0.180)
Helper 1	0.004	-0.042
	(0.079)	(0.072)
Helper 2	-0.010	-0.155**
	(0.068)	(0.069)
Observations	320	328

Notes: The table reports marginal effects (discrete changes for dummy variables) estimated with a Logit model (equation 2) in which the dependent variable is the indicator of observed migration to North ($M_{i,j}^{S,\tau}$) and the right-hand side variables are a quadratic polynomial in local civicness p_j^S (proportion of students reporting 1-5 in class) and observable covariates. Peer civic (uncivic) migrants is the fraction of civic (uncivic) students in the class, excluding oneself, that migrate after graduation. For the definitions and the descriptive statistics of the other covariates see Table A–1 in the Online Appendix Standard errors are obtained by the Delta method. Significance: * 0.1; ** 0.05; *** 0.01 or better.

In the first column of Table 2, the odds ratio for the entire sample is 0.99, suggesting that, for the population that we study, there is no civicness drain from South to North *in the aggregate*. The remaining columns separate students belonging to the lowest, the medium and the highest terciles of the distribution of local civicness. We observe odds ratios considerably larger than 1 (suggesting a civicness drain) in classes in which the fraction of civic students is either lower than 0.4 (bottom tercile: $O^S = 1.16$) or higher than 0.58 (top tercile: $O^S = 1.17$). At the same time, in the intermediate tercile the odds ratio is just 0.70, suggesting an uncivicness drain in the middle of the distribution of local civicness.

To go beyond these descriptive non-parametric results and to assess the evidence for non-monotonic migration patterns and their drivers, we estimate, separately for the Civic and the Uncivic, the following Logit model of the probability of migration to North:

$$\mathbb{P}(M_{i,j}^{S,\tau} = 1) = \Lambda(\alpha + \beta\psi(p_j^S) + \gamma Z_{i,j}) = \frac{e^{\alpha+\beta\psi(p_j^S)+\gamma Z_{i,j}}}{1 + e^{\alpha+\beta\psi(p_j^S)+\gamma Z_{i,j}}} \tag{2}$$

where $\psi(p_j^S)$ is a quadratic polynomial in local civicness p_j^S of class j and $Z_{i,j}$ is a set of covariates (described in Table A–1 of the Online Appendix) that we constructed with information originated by the collateral experimental tasks and by the final questionnaire.

The estimated marginal effects for the polynomial $\psi(p_j^S)$ are displayed in Table 3, together with those of the observable covariates, and they indicate a statistically significant U-shaped pattern of the probability of migration for the Civic as a function of local civicness, as well as a similarly significant Hump-shaped pattern for the Uncivic.

Table 4 further shows that the U-shaped pattern is more pronounced for the most risk averse among the Civic, while the Hump-shaped pattern is more pronounced for the most risk seeking among the Uncivic. These patterns indicate that the Civic are more likely to migrate at the extremes than in the middle of the distribution (even more so for the more risk averse), while the opposite holds for the Uncivic (even more so for the more risk seeking).

Inference in Tables 3 and 4 is based on the usual asymptotic approach requiring that our sample is large enough to guarantee reliable estimates of the variances of the estimated coefficients. It is of course debatable whether our sample is indeed large enough for the validity of this approach. We therefore complement the above analysis, with an approach based on randomization inference, which allows us to assess the precision of our estimates

Table 4: Probability of migration to North at different levels of risk attitudes

	Civic students		Uncivic students	
	risk averse	risk seeking	risk averse	risk seeking
Local civicness	-8.484***	-1.011	2.086	2.156***
	(2.358)	(0.786)	(2.113)	(0.743)
Local civicness squared	8.015***	1.251*	-1.397	-2.446***
	(2.092)	(0.709)	(1.890)	(0.873)
Controls	Yes	Yes	Yes	Yes
Observations	75	245	51	277

Notes: The table reports marginal effects estimated with a Logit model (equation 2) in which the dependent variable is the indicator of observed migration to North ($M_{i,j}^{S,\tau}$) and the right-hand side variables are a quadratic polynomial in local civicness p_j^S (proportion of students reporting 1-5 in class) and observable covariates (the marginal effects for the covariates are omitted to save on space, but are available from the authors). Using the indicator of risk seeking attitudes that we collected with the procedure explained in Section 2.2 and that ranges between 0 and 10, in column 1 we report estimates for the Civic with a risk seeking indicator lower than or equal to 5 (risk averse), while in column 2 the estimates are for the remaining Civic (risk seeking). Similarly for the Uncivic in the last two columns. Results are qualitatively robust to different splits. The included covariates are gender, intellectual ability, average intellectual ability in the class, risk seeking, impatience level, trust in others, family income, parental education, urban area, class size, the fractions of Civic and Uncivic classmates who declared the intention to migrate to North at the time of the experiment, as well as for the identity of the helpers who ran the experiment. For the definitions and the descriptive statistics of these covariates see Table A–1 in the Online Appendix. Standard errors are obtained by the Delta method. Significance: * 0.1; ** 0.05; *** 0.01 or better.

taking the sample as fixed.[23]

The first key ingredient of this approach is the formulation of the *Exact Null Hypothesis (ENH)* of no effect of local civicness on the probability of migration to North. Formally, this hypothesis implies that both the linear and the quadratic coefficients of the polynomial $\psi(p_j^s)$ in equation (2) are equal to zero. Therefore, under the ENH, the factual and the counterfactual migration status of each student are the same regardless of local civicness, because local civicness does not affect migration decisions.

The second key ingredient is a test statistic like the t-statistics associated to the linear and the quadratic marginal effects of local civicness reported in Tables 3 and 4. Under the ENH, we can determine the distribution of the counterfactual t-statistics across the settings generated by randomizing the level of local civicness faced by each student. Then, as sug-

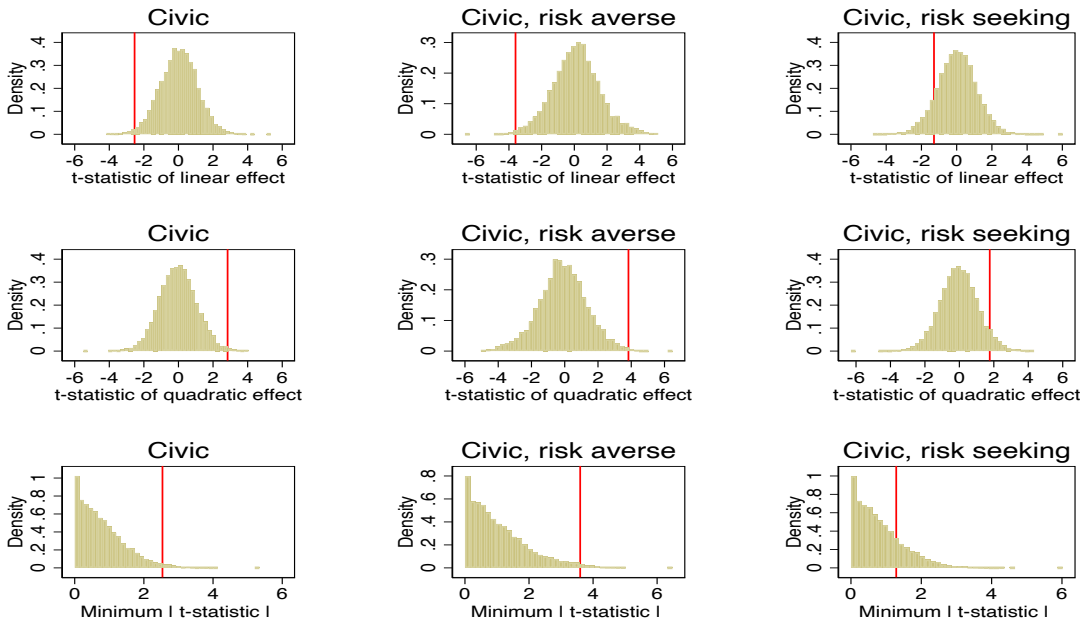
[23]See Chapter 5 in Imbens and Rubin (2015) for a clear presentation of the randomization inference approach. We thank an anonymous Referee for raising the problem and the Editor for suggesting the solution.

gested by Imbens and Rubin (2015), we can compare the observed t-statistics corresponding to the local civicness effectively faced by each student (those implicit in Tables 3 and 4), with the distribution of counterfactual t-statistics implied by the ENH. "An observed value that is 'very unlikely', given the null hypothesis and the induced distribution for the test statistic, will be taken as evidence against the null hypothesis in what is, essentially, a stochastic version of the mathematician's 'proof by contradiction'." (Imbens and Rubin, 2015, p. 58).

Specifically, to implement this approach we have generated 10,000 counterfactual data sets in which students have been randomly reallocated between the original 33 classes, keeping fixed the size of each class. Therefore, in each data set the counterfactual local civicness faced by a student is potentially different from the observed one, because the classmates of each student have changed. In the evidence presented below, all the other observable characteristics of each student are left unchanged, including the three ones that would change with a different composition of the class (Average class ability, Peer civic migrants and Peer uncivic migrants). In this way we can focus on the pure effect of changing the local civicness faced by a student, keeping fixed all the other characteristics. In the Online Appendix we report analogous results in which all the characteristics of students that depend on the composition of the class are adjusted according to each new class composition. It is reassuring that both methods lead to similar conclusions.

Figure 1 reports evidence, based on the randomization inference approach described above, that strongly supports the existence of a U-shaped profile of the migration probability of the Civic as a function of local civicness. The left panels in the figure correspond to column 1 of Table 3. The top left panel displays the distribution of the counterfactual t-statistics of the linear marginal effects as well as the observed t-statistic, marked by the red vertical line. This observed t-statistic is evidently located far in the left tail of the distribution. The entry in the first row and first column of Table 5 is the corresponding Fisher Exact P-value (FEP, see Imbens and Rubin, 2015), computed as the fraction of counterfactual t-statistics that are smaller than the observed one. This FEP is equal to 0.023, suggesting that it is safe to reject the ENH of a zero linear marginal effect of local civicness on the migration decisions of the Civic. The intermediate left panel, reports results from the same exercise for the quadratic marginal effect. In this case, the observed t-statistics is far in the right tail

Figure 1: Observed and randomized t-statistics under the ENH of no effect of local civicness on the migration decisions of the Civic



Notes: Each panel of this figure reports the distribution of the counterfactual t-statistics across 10,000 data sets in which students have been randomly re-allocated to the 33 original classes, keeping class sizes equal to the original ones. Therefore, in each counterfactual dataset the local civicness faced by a student is potentially different. All the other covariates are unchanged (see the Online Appendix for alternative approaches). The first column is for all the Civic, and corresponds to column 1 of Table 3. Using the indicator of risk seeking attitudes that we collected with the procedure explained in Section 2.2 and that ranges between 0 and 10, the second column is for the most risk averse among the Civic, defined as those with a risk seeking indicator lower than or equal to 5, and corresponds to column 1 of Table 4. In the last column, the evidence is for the remaining more risk seeking Civic, and corresponds to column 2 of Table 4. The first row is for linear marginal effects; the second row is for quadratic marginal effects and the third row is for the combined test equal to the minimum of the absolute value of the linear and the quadratic t-statistics. In all panels the corresponding observed t-statistic is marked by the red vertical line.

of the counterfactual distribution with a FEP of 0.011, which similarly allows us to reject the ENH of a zero quadratic marginal effect.

However, since the linear and the quadratic t-statistics are not independent, these separate randomization inference results are not enough to confirm the existence of a U-shaped pattern of the probability of migration for the Civic as a function of local civicness. What we need is a combined test, and we pick one among the options described in Chapter 5 of Imbens and Rubin (2015). Specifically, we report here results based on the minimum of the absolute value of the linear and the quadratic t-statistics, but other options (see the Online Appendix) give very similar results. The bottom left panel of Figure 1 displays the distribution of this combined test across the counterfactual settings, as well as the correspondent observed combined test marked again by the vertical red line. Also the observed combined

Table 5: Exact Fisher p-values for the ENH of no effect of local civicness on migration decisions of the Civic

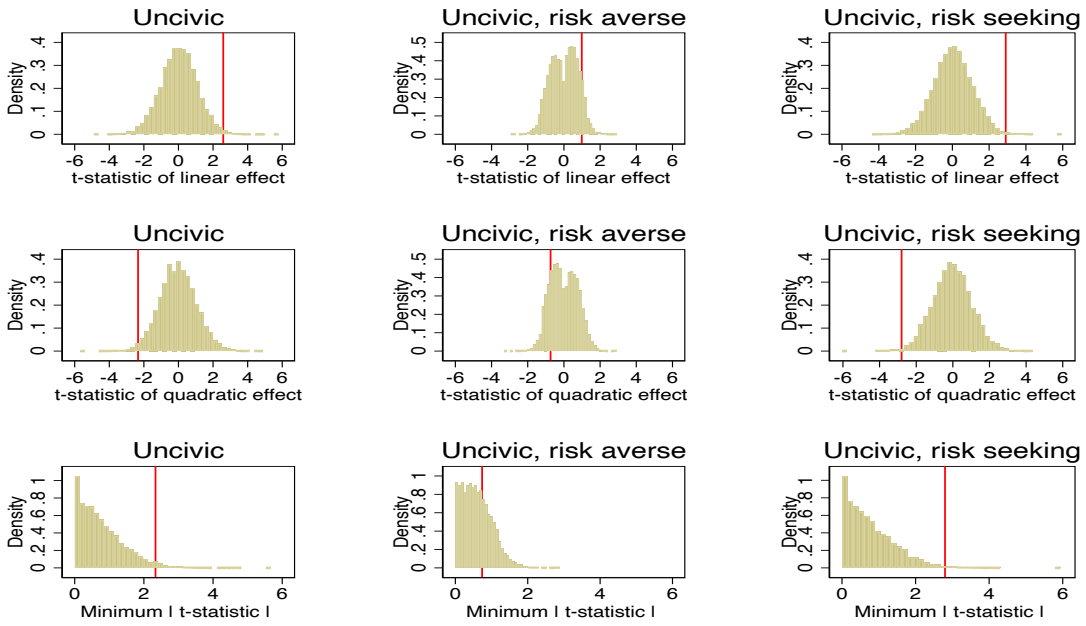
	P-value associated to the:		
	t-statistic of the linear marginal effect	t-statistic of the quadratic marginal effect	Minimum of the two t-statistics
Civic	.023	.011	.019
Uncivic	.017	.031	.027
Civic, risk averse	.02	.012	.016
Civic, risk seeking	.24	.12	.22
Uncivic, risk averse	.26	.42	.39
Uncivic, risk seeking	.0096	.012	.011

Notes: Each entry in this table is a Fisher Exact P-value (FEP, see Imbens and Rubin, 2015), computed as the fraction of counterfactual t-statistics that are smaller than the observed one, for the group of students denoted by the row and the t-statistic denoted by the column. Therefore, the first two rows correspond, respectively, to columns 1 and 2 of Table 3, while the next four rows correspond, respectively, to columns 1-4 of Table 4. Moreover, each FEP corresponds to one of the 18 panels of Figures 1 and 2. The counterfactual t-statistics are obtained from 10,000 data sets in which students have been randomly re-allocated to the 33 original classes, keeping class sizes equal to the original ones. Therefore, in each counterfactual dataset the local civicness faced by a student is potentially different. All the other covariates are unchanged (see the Online Appendix for alternative approaches). Using the indicator of risk seeking attitudes that we collected with the procedure explained in Section 2.2 and that ranges between 0 and 10, the risk averse are defined as those with a risk seeking indicator lower than or equal to 5. The risk seeking are the remaining students.

test is located far in the right tail of its counterfactual distribution, with a FEP equal to 0.019 (first row, third column of Table 5). We can therefore conclude that even the randomization inference approach supports the existence of a statistically significant U-shaped profile of the probability of migration of the Civic as a function of local civicness.

Using the asymptotic inference approach, we have also shown, in Table 4, that this U-shaped profile is significantly more pronounced for the most risk averse among the Civic. The remaining panels in Figure 1 and rows 3 and 4 in Table 5 analyse this additional conclusion using the randomization inference approach. The central column of the panels in Figure 1 shows that for the most risk averse among the civic the linear, the quadratic and the combined t-statistics are all located far in the tails of the respective counterfactual distributions (the corresponding FEPs are 0.02, 0.012 and 0.016). For the most risk seeking among the Civic,

Figure 2: Observed and randomized t-statistics under the ENH of no effect of local civicness on the migration decisions of the Uncivic



Notes: Each panel of this figure reports the distribution of the counterfactual t-statistics across 10,000 data sets in which students have been randomly re-allocated to the 33 original classes, keeping class sizes equal to the original ones. Therefore, in each counterfactual dataset the local civicness faced by a student is potentially different. All the other covariates are unchanged (see the Online Appendix for alternative approaches). The first column is for all the Uncivic, and corresponds to column 2 of Table 3. Using the indicator of risk seeking attitudes that we collected with the procedure explained in Section 2.2 and that ranges between 0 and 10, the second column is for the most risk averse among the Uncivic, defined as those with a risk seeking indicator lower than or equal to 5, and corresponds to column 3 of Table 4. In the last column, the evidence is for the remaining more risk seeking Uncivic, and corresponds to column 4 of Table 4. The first row is for linear marginal effects; the second row is for quadratic marginal effects and the third row is for the combined test equal to the minimum of the absolute value of the linear and the quadratic t-statistics. In all panels the corresponding observed t-statistic is marked by the red vertical line. In less than 1% of the counterfactual datasets, convergence of the Logit estimation was not achieved for the Uncivic risk averse (who are only 51). This explains the irregular shape of the counterfactual distribution in the corresponding panels.

instead, the observed t-statistics are not in the tail of the respective distributions (FEP: 0.24, 0.12, 0.22). Therefore, both inference approaches confirm that the U-shaped profile of the probability of migration as a function of local civicness for the Civic is statistically and quantitatively more significant among the most risk averse of them. The ENH cannot be rejected however for the Civic who are more inclined to seek risk.

Figure 2 and rows 2, 5 and 6 of Table 5 repeat this entire randomization inference analysis for the Uncivic. In their case, the conventional evidence in Tables 3 and 4 suggests the existence of a Hump-shaped profile of the probability of migration as a function of local civicness and this conclusion is confirmed by randomization inference as well. The t-statistic of the linear marginal effect is far in the right tail of the corresponding distribution (FEP: 0.017) and even more so for the most risk seeking among the Uncivic (FEP: 0.0096). The

t-statistic of the quadratic marginal effect is instead located in the left tail (FEP: 0.031) and also in this case this is even more true for the most risk seeking among the Uncivic (FEP: 0.012). Finally, the combined test based on the minimum of the absolute values of the linear and the quadratic t-statistics confirms the Hump-shaped profile (FEP: 0.027), in particular for the most risk seeking Uncivic students (FEP: 0.011). The ENH cannot be rejected however for the Uncivic who are most risk averse.

The role played by risk seeking attitudes in shaping the above results suggests that if the Uncivic are sufficiently more risk seeking than the Civic the two patterns could intersect, originating an uncivicness drain at intermediate values of local civicness. We explore this possibility in the next section.

3.4 Risk attitudes of Civic and Uncivic types

To explore the conjecture that, on average, the Uncivic are more risk seeking than the Civic, we exploit the measure of risk seeking attitudes that we collected with the procedure explained in Section 2.2. We confirm the positive correlation between risk seeking and being Uncivic which we already highlighted in our comment in Section 3.1 to Table A–8 of the Online Appendix. Specifically, Table 6 shows that the distribution of risk seeking preferences for the Uncivic *stochastically dominates* the corresponding distribution for the Civic.[24]

We formally test this assertion using the procedure proposed by Barrett and Donald (2003) and we reject the null that the distribution of risk seeking for the Civic weakly dominates in a stochastic sense the distribution for the Uncivic (test statistic = 1.46; p-value = 0.0142).[25] We therefore conclude that:

Finding 4 *The Uncivic are more risk-seeking than the Civic.*

[24] These findings resonate with recent results reported in Table 4 of Falk et al. (2018), who study pairwise correlations between preferences across countries and find that risk taking is negatively correlated with positive reciprocity ($p < 0.05$) and positively correlated with negative reciprocity ($p < 0.10$).

[25] The test statistic is

$$\widehat{S_{cu}} = \sqrt{\frac{n_c \times n_u}{n_c + n_u}} \quad sup_{p_j^S \in (0,1)} (\widehat{F}_c(q) - \widehat{F}_u, (q))$$

where n_c and n_u are the numbers of Civic and Uncivic respectively; $p_j^S \in (0,1)$ denotes the common support of the two empirical distributions; $\widehat{F}_c(q)$, $\widehat{F}_u(q)$ are the cumulative distribution functions of the risk-seeking indicator for the two types. The p-value of the test is computed as p-value= $exp(-2(\widehat{S})^2)$ where $\widehat{S}$ is the observed value of the test.

Table 6: Risk seeking of Civic and Uncivic types in Calabria

Willingness to take risks	Civic			Uncivic		
	Number of participants	Share	Cumulative share	Number of participants	Share	Cumulative share
0 (not willing to take risks)	2	0.60	0.60	0	0.0	0.0
1	1	0.30	0.91	1	0.29	0.29
2	4	1.21	2.11	1	0.29	0.59
3	6	1.81	3.93	5	1.47	2.06
4	17	5.14	9.06	11	3.24	5.29
5	48	14.50	23.56	36	10.59	15.88
6	43	12.99	36.56	32	9.41	25.29
7	82	24.77	61.33	90	26.47	51.76
8	83	25.08	86.40	98	28.82	80.59
9	32	9.67	96.07	38	11.18	91.76
10 (very prone to take risks)	13	3.93	100.00	28	8.24	100.00
Observations		331			340	

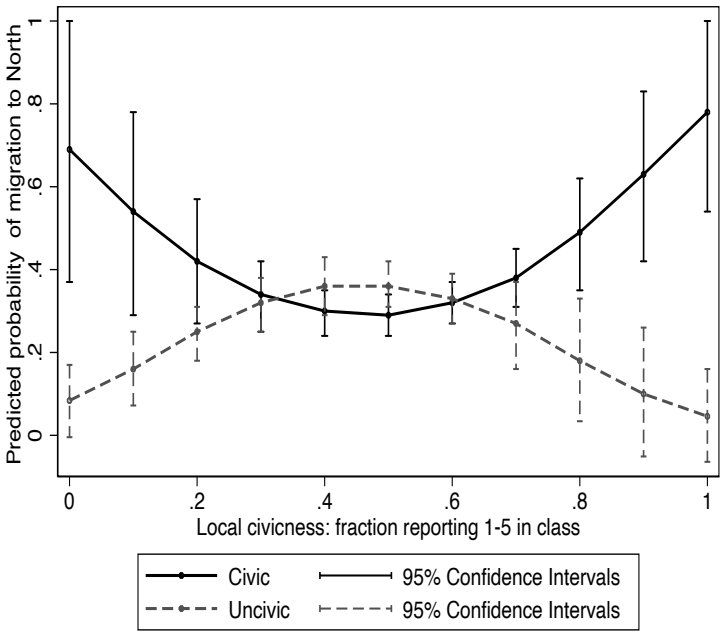
Notes: This table reports, separately for Civic and Uncivic students of Calabria, the statistical distribution of answers to the following question (non-incentivized): "How would you describe yourself: are you ready to take risks, or rather you try to avoid taking any risk?". This question was part of the questionnaire administered to students at the end of the experiment (see Section 2). The distribution for Uncivic individuals stochastically dominates that for Civic individuals, which implies that the former are more willing to take risks. Using the Barrett and Donald (2003) test, we reject the null that the distribution for the Civic weakly dominates in a stochastic sense the distribution for the Uncivic (test statistic = 1.46; p-value = 0.0142)

3.5 Intersection of the migration patterns of Civic and Uncivic

Having established that the Uncivic are more risk seeking than the Civic, we now explore whether this difference is large enough to generate an intersection of the two migration patterns, which would imply the existence of an Uncivicness drain at intermediate values of local civicness in conjunction with a civicness drain at the extremes.

To visualize whether this intersection occurs and what kind of drains it may generate, we plot in Figure 3 the predicted probabilities of migration along the support of the distribution of local civicness together with their corresponding 95% confidence intervals. In the tails, it is immediately evident that the probability of migration of the Civic is significantly larger than the analogous probability for the Uncivic, while at intermediate values of local civicness the opposite happens although with overlapping 95% confidence intervals.

Figure 3: Predicted probability of migration to North at different levels of local civicness



Notes: The figure plots predicted probabilities of observed migration to North, $\mathbb{P}(M_{i,j}^{S,\tau} = 1)$, based on a logit model of the migration indicator $M_{i,j}^{S,\tau}$ on a quadratic polynomial in local civicness p_j^S (proportion of students reporting 1-5 in class) and covariates (equation 2). The estimated marginal effects of the Logit model are displayed in Table 3. 95% confidence intervals for the predicted probabilities are computed with the Delta method. The included covariates are: gender, intellectual ability, average intellectual ability in the class, risk seeking, impatience level, trust in others, family income, parental education, urban area, class size, the fractions of Civic and Uncivic classmates who declared the intention to migrate to North at the time of the experiment, as well as for the identity of the helpers who ran the experiment. For definitions and descriptive statistics of these variables see Table A–1 of the Online Appendix.

However, we need to use one-sided tests in order to assess formally if the predicted odds ratio of migration for the Civic versus the Uncivic, O^S, is greater than 1, implying a civicness drain, or smaller than 1, implying an uncivicness drain. The results of these one-sided tests are reported in Table 7. The predicted probabilities of migration and their corresponding standard errors are displayed in columns 2 and 3 for the Civic and in columns 8 and 7 for the Uncivic. Column 5 shows the corresponding odds ratios O^S. Column 4 reports the p-value of a test for the null hypothesis that $H_0 : O^S \leq 1$: rejection of this null implies that $O^S > 1$ and that a civicness drain occurs at the corresponding level of local civicness.[26] Column 6 reports the p-value of the opposite test for the null hypothesis that $H_0 : O^S \geq 1$: rejection of this null implies that $O^S < 1$ and that an uncivicness drain occurs instead at the corresponding level of local civicness.[27]

When local civicness is very low, the odds ratio is significantly greater than 1, reaching a value of 24.27 for $p_j^S \approx 0$ (p-value=0.0002), 6.16 for $p_j^S = 0.1$ (p-value=0.0021) and 2.17 for $p_j^S = 0.2$ (p-value=0.0209). Proceeding along the support towards higher local civicness, the odds ratio continues to decline, reaching a statistically significant minimum of 0.73 when $p_j^S = 0.5$ (p-value=0.0253). Beyond this degree of local civicness the odds ratio increases, becoming again significantly greater than 1 at $p_j^S = 0.7$, with a value of 1.66 (p-value=0.0434), and reaching a maximum of 73.53 at $p_j^S \approx 1$ (p-value=0.000).

We summarize these results in our fifth finding:

Finding 5 *A statistically and quantitatively significant civicness drain takes place at high and low local civicness, while when local civicness is equal to 0.5 a statistically significant uncivicness drain occurs.*

In the next section we propose a model that rationalizes these findings and helps to interpret them.

[26] The test statistic is $\frac{\mathbb{P}(M_{i,j}^{S,c}=1) - \mathbb{P}(M_{i,j}^{S,u}=1)}{\sqrt{\sigma_c^2 + \sigma_u^2}}$ where σ_τ is the standard error of $\mathbb{P}(M_{i,j}^{S,\tau}=1)$.

[27] The test statistic is $\frac{\mathbb{P}(M_{i,j}^{S,u}=1) - \mathbb{P}(M_{i,j}^{S,c}=1)}{\sqrt{\sigma_u^2 + \sigma_c^2}}$.

Table 7: Odds ratio of migration for Civic versus Uncivic students along the support of the distribution of local civicness

	Civic		Test on odds ratios			Uncivic	
Local civicness	Prob. of migration	Standard error	p-value for $H_0: O^S \leq 1$	Odds ratio O^S	p-value for $H_0: O^S \geq 1$	Standard error	Prob. of migration
1	2	3	4	5	6	7	8
0	0.69	0.16	0.0002	24.27	0.9998	0.045	0.084
0.1	0.54	0.12	0.0021	6.16	0.9979	0.045	0.16
0.2	0.42	0.076	0.0209	2.17	0.9791	0.036	0.25
0.3	0.34	0.042	0.3584	1.09	0.6416	0.033	0.32
0.4	0.3	0.027	0.9272	0.76	0.0728	0.034	0.36
0.5	0.29	0.024	0.9747	0.73	0.0253	0.030	0.36
0.6	0.32	0.026	0.6547	0.96	0.3453	0.032	0.33
0.7	0.38	0.038	0.0434	1.66	0.9566	0.054	0.27
0.8	0.49	0.067	0.0015	4.38	0.9985	0.077	0.18
0.9	0.63	0.1	0.0000	15.32	1.0000	0.079	0.10
1	0.78	0.12	0.0000	73.53	1.0000	0.056	0.046
Observations	320			648		328	

Notes: For the levels of local civicness listed in column 1, this table reports predicted probabilities of migration to North for the Civic (column 2) and the Uncivic (column10), estimated with a Logit model of the migration indicator $M_{i,j}^{S,\tau}$ on a quadratic polynomial in local civicness p_j^S (proportion of students reporting 1-5 in class) and covariates (equation 2). The estimated marginal effects of the Logit model are displayed in Table 3. The included covariates are: gender, intellectual ability, average intellectual ability in the class, risk seeking, impatience level, trust in others, family income, parental education, urban area, class size, the fractions of Civic and Uncivic classmates who declared the intention to migrate to North at the time of the experiment, as well as the identity of the helpers who ran the experiment. For definitions and descriptive statistics of these variables see Table A–1 of the Online Appendix. Standard errors for the predicted probabilities are computed with the Delta method and are reported, respectively, in column 3 for the Civic and 7 for the Uncivic. Column 5 reports the predicted Odds Ratio O^S of migration of Civic versus Uncivic students (see equation 1), for the level of local civicness corresponding to each row. Column 4 contains the p-value of a test for the null hypothesis that $O^S \leq 1$. The test statistic is $\frac{\mathbb{P}(M_{i,j}^{S,c}=1)-\mathbb{P}(M_{i,j}^{S,u}=1)}{\sqrt{\sigma_c^2+\sigma_u^2}}$ where σ_τ is the standard error of $\mathbb{P}(M_{i,j}^{S,\tau}=1)$ reported in columns 3 for the Civic and 9 for the Uncivic. Column 6 contains the p-value of the opposite test for the null hypothesis that $O^S \geq 1$. The test statistic is $\frac{\mathbb{P}(M_{i,j}^{S,u}=1)-\mathbb{P}(M_{i,j}^{S,c}=1)}{\sqrt{\sigma_u^2+\sigma_c^2}}$.

4 A model of civicness and migration

Consider a country with two regions, South and North, denoted by $r = \{S, N\}$. In each region there are J localities of identical size, with the population at each locality represented by a continuum of individuals with a unit measure. A player i living in locality j of region r belongs to one of two types: the Civic (denoted by $\tau = c$), whose fraction in locality j of region r is $p_j^r \in [0, 1]$) and the Uncivic (denoted by $\tau = u$), whose fraction, in the same locality, is $1 - p_j^r$. Therefore, p_j^r is the degree of local civicness of locality j of region r and $\bar{p}^r \equiv \mathbb{E}_j[p_j^r]$ denotes the average degree of local civicness in region r, where $\bar{p}^S < \bar{p}^N$. With respect to Italy, this assertion is in line with the existing literature (see footnotes 2 and 3) and is confirmed by our *Finding 1*.

4.1 The game in the two regions and the corresponding equilibria

At each locality, the population plays a public goods game in which contribution to the public good is *mandatory* (just like in our modified die-roll task for subjects rolling a number different than six): each player is required to contribute one unit, and the total contributed sum is then multiplied by a productivity coefficient before being distributed back to the citizens. Thus the game captures civic duties such as tax payments (rather than voluntary contribution to one's community). The Civic always contribute (because this is what one "ought to do"), while the Uncivic contribute if and only if contributing maximizes their payoff.[28] We denote by π_j^r the actual fraction of contributors in locality j of region r (possibly greater than p_j^r if some Uncivic types decide to contribute).

4.1.1 The optimization problem of the regional authorities

The national institutions, which are common to both regions, impose a fine of size $\phi > 1$ on an individual who is caught shirking, but enforcement of this sanction is implemented

[28] Algan, Cahuc, and Sangnier (2017) make the same set of assumptions in their analysis of civicness, uncivicness and the welfare state. In our context, the assumption about Civic behavior could be explicitly modelled by a sufficiently high internal cost of cheating for the Civic. We believe, however, that this would be redundant for our goals in this paper. Our setup presents similarities also with Greif and Tabellini (2017), in which the propensity to contribute to the public good depends on the interaction between one's type (clannish or generalist) and the region in which one lives (clan or city).

at the *regional* level. The regional authorities observe the non-contributors, but going after them and collecting the fines is costly. The cost of fining a mass t of non-contributors is denoted by $k(t)$ and satisfies the standard assumptions ($k'(t) > 0$, $k''(t) > 0$). The level of enforcement (i.e., the value of t) is determined endogenously in each region to maximize the difference between revenues and costs of the authorities, subject to $t \leq (1 - \bar{\pi}^r)J$, where $\bar{\pi}^r \equiv \mathbb{E}_j[\pi_j^r]$ denotes the fraction of contributors in region r (hence $(1 - \bar{\pi}^r)J$ is the total mass of non-contributors in the region).

Given that the revenue of the authorities from enforcement, ϕt, is linear in t, while $k(t)$ is convex, it follows immediately that the marginal cost from enforcement exceeds the marginal revenue if and only if $t > t^*$, where t^* is given implicitly by $\phi = k'(t)$. Thus, the authorities will choose a level of enforcement $t^r = t^*$ if $t^* \leq (1 - \bar{\pi}^r)J$ and $t^r = (1 - \bar{\pi}^r)J$ otherwise.

4.1.2 The optimization problem of the individual

Moving now to the individual's viewpoint, let $g(t^r, \bar{\pi}^r)$ denote the probability to get caught for not contributing in region r. We will assume that the regional authorities randomly select the mass t^r of non-contributors to be fined, so that $g(t^r, \bar{\pi}^r) = \frac{t^*}{(1-\bar{\pi}^r)J}$ if $t^r = t^* \leq (1 - \bar{\pi}^r)J$ and $g(t^r, \bar{\pi}^r) = 1$ otherwise.

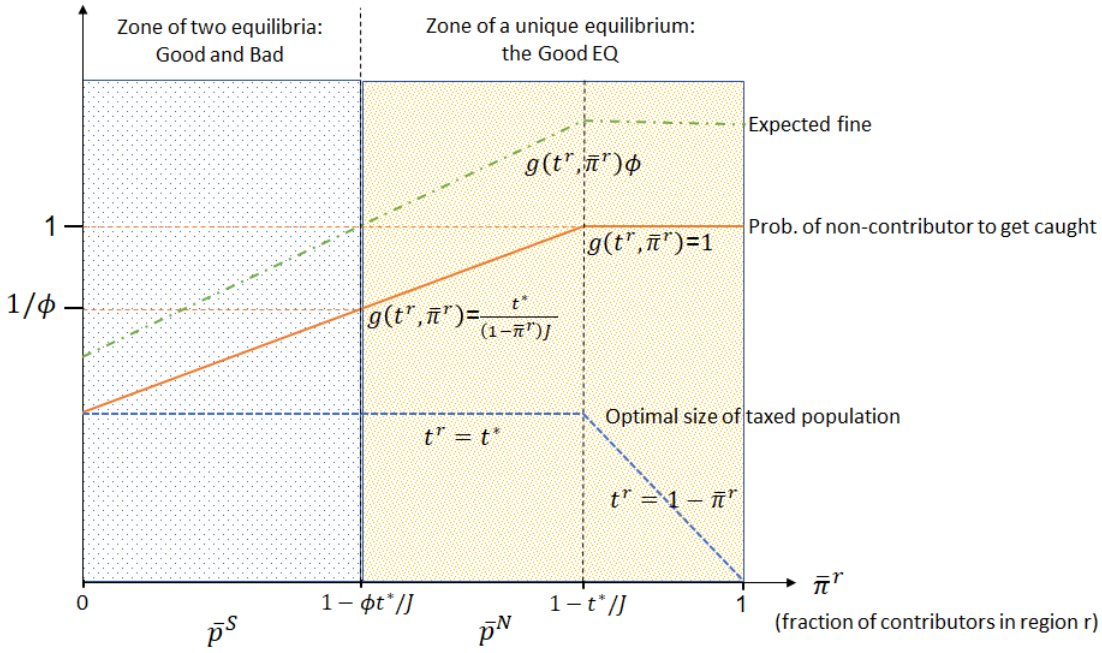
We are now ready to specify the individual payoffs. The contribution made by the citizens is multiplied by a productivity coefficient $\lambda > 1$ and then divided between the locality and the region, with a fraction α going to the locality and the rest to the region. The contributions collected by the regional authorities from all localities in the region are added (after being multiplied by λ) to the profits from enforcement (revenue from fines minus the cost of enforcement) and then evenly divided among the inhabitants of the J localities. The payoff of a contributor is thus $\lambda[\alpha\pi_j^r + (1-\alpha)\bar{\pi}^r] + \frac{\phi t^r - k(t^r)}{J} - 1$ and the payoff of a non contributor is $\lambda[\alpha\pi_j^r + (1-\alpha)\bar{\pi}^r] + \frac{\phi t^r - k(t^r)}{J} - g(t^r, \bar{\pi}^r)\phi$. Hence, an Uncivic will contribute if and only if

$$g(t^r, \bar{\pi}^r)\phi > 1. \tag{3}$$

As visualized in Figure 4, the LHS of equation 3 increases in $\bar{\pi}^r$. Hence, this decision rule captures the strategic complementarity of contribution – the more people in the region are

contributing, the more each individual Uncivic is inclined to contribute as well.[29] Note that the same parameter values apply to all localities of a region, hence if an Uncivic individual in some locality of region r strictly prefers to contribute, so do all the other Uncivic individuals in region r. Thus, a region may potentially be in any one of two pure strategy equilibria: a *good* equilibrium, where all the Uncivic types in all localities of the region contribute, and a *bad* equilibrium, where all the Uncivic types in all localities of the region shirk from contribution.[30]

Figure 4: Components of the expected fine as a function of contributions in a region



Notes: The figure depicts, as a function of the fraction of contributors in the region, (1) the optimal size of the taxed population (dashed blue line); (2) the probability of a non contributor to get caught (solid orange line) and (3) the corresponding expected fine (dash-dotted green line).

Since we are interested in how local civicness shapes migration to North from heterogeneous localities in the South, we will assume that the two regions differ not because by chance they are in different equilibria, but because the gap in average degree of local civicness puts

[29]The property that civic behavior pays off only if sufficiently many others behave civically too is in line with Propositions 4 and 5 of Michaeli (2020).

[30]When both of these equilibria exist there is also a third mixed equilibrium, where the proportion of Uncivic who contribute is such that $g(t^r,\bar{\pi}^r)\phi$ equals exactly 1. Given that this equilibrium requires a very peculiar mixture of actions and is not dynamically stable we ignore it in our analysis.

them on separate tracks. In particular, we make the following assumption on the primitives of the model:

Assumption 1 $\frac{t^*}{(1-\bar{p}^S)J} < \frac{1}{\phi} < \min\{\frac{t^*}{(1-\bar{p}^N)J}, 1\}$.

Given that $t^r = \min\{t^*, (1-\bar{\pi}^r)J\}$ is the optimal level of enforcement chosen by the regional authorities, Assumption 1 implies (see Figure 4) that $g(t^S, \bar{p}^S) < \frac{1}{\phi} < g(t^N, \bar{p}^N)$. In light of equation 3, this means that an Uncivic will choose to contribute in the North even if all the other Uncivic players shirked from contribution (i.e., when $\bar{\pi}^N = \bar{p}^N$), while in the South this does not hold.

Corollary 1 *The only equilibrium in the North is the good one, while the South may end up in either a bad or a good equilibrium.*

The good equilibrium is not ruled out in the South because if all the Uncivic in this region do contribute, so that $\bar{\pi}^S = 1$, then $g(t^S, \bar{\pi}^S) = g(t^S, 1) = 1$, in which case the inequality in (3) holds. Hence, an Uncivic will contribute even in the South if sufficiently many other Uncivic types do so as well. However, while Corollary 1 does not guarantee that the South is in the bad equilibrium, we interpret the Italian North-South gap in social capital as indicative of the equilibrium in the South being bad (because, in light of the model, no difference in $\bar{\pi}^r$ can be observed if both regions are in the good equilibrium). Thus, we make the following assumption.

Assumption 2 *The South is in the bad equilibrium.*

The bad equilibrium in the South implies that this region is caught in an *uncivicness trap* - in all localities the Uncivic do not contribute to the public good, so that $\bar{\pi}^S = \bar{p}^S$. Thus the payoffs in a southern locality j are $\lambda[\alpha p_j^S + (1-\alpha)\bar{p}^S] + \delta - 1$ for a Civic and $\lambda[\alpha p_j^S + (1-\alpha)\bar{p}^S] + \delta - E_\phi^S$ for an Uncivic, where $\delta \equiv \frac{\phi t^* - k(t^*)}{J}$ is the return from fine collection and $E_\phi^S \equiv \frac{t^*}{(1-\bar{p}^S)J}\phi$ is the expected fine in the South.

With respect to the North, Assumption 1 implies that all the Uncivic in all localities contribute to the public good. As a result, all northerners contribute and, moreover, any

southern Uncivic migrant to the North will choose to contribute as well. The net payoff of a player of any type in any locality in the North is therefore $\lambda[\alpha \cdot 1 + (1-\alpha) \cdot 1] - 1 = \lambda - 1$. Note, however, that, in line with our *Finding* 2, the model allows for the following remark:

Remark 1 *Assumption 1 does not exclude the possibility that the least Civic localities in the North are less Civic than some localities in the South, i.e.* $\min_j p_j^N < \max_j p_j^S$.

4.2 The role of beliefs about being accepted in a different region

When a player emigrates to another locality, whether in the North or in the South, she is not guaranteed to be allowed to play the public goods game in the destination.[31] Beginning with the North, even if an Uncivic migrant is expected not to cheat, northerners may still refuse to play with migrants from South whom they suspect to be Uncivic, because letting in too many Uncivic bears the risk that $\bar{p}^N$ would fall below $g^{-1}(\frac{1}{\phi})$ (see equation 3), opening up the possibility of switching to the bad equilibrium. Similar arguments are occasionally made by proponents of policies to restrict immigration from developing countries into the EU.

As for the South, also this region fears letting in Uncivic migrants and hence may not allow them to play if there is a high probability that they are Uncivic. This is because such migrants are expected to shirk from contribution (since in the South this is more profitable to do) and thus decrease everybody's share of the public good. Therefore, if a potential migrant (to whatever region) thinks she is likely to be considered Uncivic in the place of destination (independently of her true type), she will be more reluctant to migrate because migration would entail the payment of a cost h without any benefit. In what follows we will focus only on migration from South to North, while migration in the opposite direction, which is empirically less relevant (see Section 2.3.1), will be analysed in the Online Appendix. [32]

The possibility of not being allowed to play in the North explains the crucial role in our model of the belief of a southern migrant about whether North will consider her Civic or

[31] There is substantial anecdotal evidence that people from northern Italy statistically discriminate people from southern Italy, considering them as less civic or trustable and thus refraining from hiring them, from renting them apartments and, in general, from entertaining economic transactions with them. As a recent example, see Figure A–10 in the Online Appendix.

[32] Specifically, the Online Appendix shows that our model is consistent with the empirical finding that very few students migrate from North to South.

Uncivic (a second order belief). In particular, we assume that South players base their belief about the chance of being allowed to join the game in the North on their local civicness level p_j^S (which incidentally also equals the actual level of contribution π_j^S).

Assumption 3 *A migrant from South to North assigns probability p_j^S to the event of being allowed to play in the destination locality.*

This assumption, which is supported by our *Finding* 3, reflects the idea that coming from a more civic locality in the South makes an immigrant more optimistic about the opinion that northern people have on her civicness. Note that, as in the Self-Confirming Equilibrium concept studied by Fudenberg and Levine (1993), these beliefs do not need to be correct in equilibrium if players do not have a chance to observe play that contradicts them before taking their decision. This is the likely scenario for the migrants that we study. At the same time, this assigned probability can be rationalized as being equal to the actual probability of being accepted in the North[33] and, as mentioned above, it is also supported by *Finding* 3.

4.3 Migration from South to North and risk attitudes

The last ingredient that we need in order to model the decision of a southern player to migrate or stay is her *risk attitude*. As shown for example by Jaeger et al. (2010) and by our evidence presented in Section 3, risk attitudes are an important determinant of migration decisions. If a southern player migrates to the North and is allowed to play there she will contribute to the public good, regardless of her type. Hence, she believes to face, in the North, a probability p_j^S of gaining a payoff of $\lambda - 1$ and 0 otherwise. Since players may differ in their attitude towards risk, we represent this stochastic payoff by $X_{i,j}^S(\lambda - 1)$, where $X_{i,j}^S$ is a measure of the combined effect of the belief p_j^S and the individual's risk attitude. One may think of $X_{i,j}^S(\lambda - 1)$ as capturing player i's *certainty equivalence* of a gamble yielding

[33] Without modelling explicitly this possibility, a simple procedure that would deliver it is as follows. Players of a destination locality in the North ask around if anybody knows anyone from the southern locality from which the migrant arrives, until somebody who knows one (random) person from there is found. If that random southern person is Civic, the migrant will be allowed to join the game, and if she is Uncivic she will not be allowed. This produces exactly a probability p_j^S of the event of being allowed to play in the destination locality, as stated in Assumption 3.

$\lambda - 1$ with probability p_j^S and 0 otherwise. We let $X_{i,j}^S$ take the following form:

$$X_{i,j}^S = \frac{p_j^S q_i}{p_j^S q_i + (1 - p_j^S)(1 - q_i)}, \tag{4}$$

where q_i is a parameter capturing the attitude of individual i towards risk, with cumulative distribution functions $F_c(q)$ and $F_u(q)$ for Civic and Uncivic types respectively, both with full support in $(0, 1)$. A smaller q_i means more risk aversion, and $q_i = \frac{1}{2}$ implies that the player is risk-neutral. We assume that $F_c(q)$ and $F_u(q)$ are independent of the local level of civicness p_j^r but may differ between Civic and Uncivic types. Thus, for any $p_j^S \neq \{0, 1\}$, $X_{i,j}^S$ goes from 0 to 1 as q_i goes from 0 to 1, capturing an increased willingness to migrate as q_i increases,[34] while $X_{i,j} = 0$ ($X_{i,j} = 1$) independently of q_i if $p_j^S = 0$ ($p_j^S = 1$).

For both types, the total cost of migrating, inclusive of the opportunity cost, is h plus the payoff from remaining in the South. Denoting by v^τ the payoff that a player of type τ derives from the public goods game played in the South, we get that the net gain from migration is given by

$$\mathbb{M}_{i,j}^{S,\tau} = X_{i,j}^S (\lambda - 1) - h - v^\tau. \tag{5}$$

Defining $\bar{X}^\tau \equiv \frac{h + v^\tau}{\lambda - 1}$, we get that

$$\mathbb{M}_{i,j}^{S,\tau} > 0 \quad \Leftrightarrow \quad X_{i,j}^S > \bar{X}^\tau. \tag{6}$$

We then posit that a southern player i of type τ in locality j migrates to North if and only if (6) holds, so that her net gain from migration is positive.

4.4 The conditions for a Civicness or an Uncivicness drain

We now have all the elements to study under what conditions we should observe a Civicness or an Uncivicness drain from South to North. In light of *Finding* 5, we will analyze separately what happens at the extremes of the support of the distribution of local civicness and what

[34] As explained in Section 2.2, we have constructed an ordinal (11 levels) measure of risk seeking based on a non-incentivized question. Using this information, a regression of the indicator of actual migration to North on the measure of risk seeking indicates that one step towards more willingness to take risks is associated with a 2.0 percentage points increase (two-sided p-value, 0.054) in the probability of migration to North of students in Calabria. This is consistent with the findings of Jaeger et al. (2010).

happens at intermediate values of the same support.

4.4.1 At the extremes of the distribution of local civicness

Strictly speaking, there is no such thing as a civicness or an uncivicness drain when p_j^S equals exactly 0 or 1 because in each of these two cases there is only one type of players. However, to simplify the exposition, we use $p_j^S = 0$ and $p_j^S = 1$ to indicate local neighbourhoods of 0 and 1, respectively. With reference to these neighbourhoods, we can prove the following:

Proposition 1 *At the extremes of the distribution of local civicness ($p_j^S = 0$ or $p_j^S = 1$):*

1. *an Uncivicness drain cannot occur.*

2. *a Civicness drain can instead occur for a plausible range of values of the cost of migration. Specifically:*

   (a) *a Civicness drain at $p_j^S = 0$ occurs if and only if $E_\phi^S < h_{eff} < 1$, where $h_{eff} \equiv h + \delta + (1-\alpha)\lambda\bar{p}^S$ is the effective cost of migration.*

   (b) *a Civicness drain at $p_j^S = 1$ occurs if and only if $(1-\alpha)\lambda - 1 + E_\phi^S < h_{eff} < (1-\alpha)\lambda$.*

Proof. See the Online Appendix. ■

Part 1 of Proposition 1 tells us that at the extremes of the distribution of local civicness the Civic migrate at least as much as the Uncivic. This stems from the fact that, at the extremes, $X_{i,j}^S$ is independent of i while $\bar{X}^\tau$ is larger for the Uncivic than for the Civic (otherwise the Uncivic would imitate the Civic), implying by equation (6) that the Civic are more prone to migrate than the Uncivic and hence an Uncivicness drain cannot occur. Intuitively, at the extremes of the support risk attitudes are irrelevant and the cost of remaining in the South is higher for the Civic, while the gain from migrating to North is the same for both types.

Part 2 of Proposition 1 further says that a Civicness drain is possible under conditions that are plausible and not very restrictive, which can explain the first part of *Finding* 5. In particular, for (all) the Civic to migrate at $p_j^S = 0$ it must be that their anticipated payoff in

the North is larger than their payoff in the South (taking the migration cost into account), i.e., $0 > h + \delta + (1-\alpha)\lambda\bar{p}^S - 1 = h_{eff} - 1 \Rightarrow$

$$h_{eff} < 1, \tag{7}$$

reflecting the idea that the effective cost of migration (composed of the actual cost h, the loss of the share in the fine collection δ and the loss of the share in the public good of the Southern region $(1-\alpha)\lambda\bar{p}^S$) must be lower than the loss of a Civic player from being free-rided by everyone else in her community of origin.

For (all) the Uncivic to stay instead at the same extreme, it must be that $0 < h + \delta + (1-\alpha)\lambda\bar{p}^S - E^S_\phi = h_{eff} - E^S_\phi \Rightarrow$

$$h_{eff} > E^S_\phi, \tag{8}$$

reflecting the idea that the effective cost of migration must be higher than the expected loss of an Uncivic player from being caught shirking from contribution in the South.[35]

Also a Civicness drain at $p^S_j = 1$ implies that all the Civic migrate while all the Uncivic do not. Hence for the Civic it must be that $\lambda - 1 > h + \delta + (1-\alpha)\lambda\bar{p}^S + \alpha\lambda - 1 = h_{eff} + \alpha\lambda - 1 \Rightarrow$

$$h_{eff} < (1-\alpha)\lambda. \tag{9}$$

To understand what this condition means, note that by migrating to the North, the migrant forsakes her part in the regional public good in the South but, when $p^S_j = 1$, she gains a part in the regional public good in the North. The net benefit from this exchange is positive and equals $(1-\alpha)(\lambda\bar{\pi}^N - \lambda\bar{\pi}^S) = (1-\alpha)\lambda - (1-\alpha)\lambda\bar{p}^S$ (where the second element is already included in h_{eff}). In other words, condition (9) requires that the economic advantage of the North over the South, as embodied in the gap between their corresponding levels of public services, should be sufficiently high to make any Civic player willing to migrate even if all other players in her community of origin are Civic.[36] For the Uncivic to stay we need instead

[35] Note that (7) and (8) can jointly hold because $E^S_\phi < 1$ (the expected fine in the South is smaller than the required contribution).

[36] It is generally perceived in Italy that the quality of public services is significantly higher in the North than in the South (see for example Taddei, 2020). This perception has been extensively documented by the financial newspaper Il Sole24Ore, within its yearly survey of the quality of life in Italian provinces (see https://lab24.ilsole24ore.com/qualita-della-vita/ and the Online Appendix for some examples).

$$\lambda - 1 < h + \delta + (1-\alpha)\lambda\bar{p}^S + \alpha\lambda - E_\phi^S = h_{eff} + \alpha\lambda - E_\phi^S \Rightarrow$$

$$h_{eff} > (1-\alpha)\lambda - 1 + E_\phi^S, \tag{10}$$

which requires that, when all other players in the community of origin are Civic, the gain of an Uncivic from migrating (and subsequently switching from free riding to contributing) is smaller than the (effective) cost of migration.

4.4.2 At intermediate values of the distribution of local civicness

Assuming that a Civicness drain occurs at the extremes of the support of local Civicness (i.e. inequalities (7) to (10) hold), we now investigate what happens at intermediate values of the support of the distribution. Denote by $\bar{q}_j^\tau$ the value of the risk attitude parameter q_i which makes an individual of type τ from locality j indifferent between migrating to North and staying in the South.[37] Thus, $1 - F_\tau(\bar{q}_j^\tau)$ is the fraction of migrants of type τ from locality j: at each location j, players of type τ who are less risk averse (or more risk seeking) than $\bar{q}_j^\tau$ have a positive net gain from migration and therefore migrate; those who are instead more risk averse than $\bar{q}_j^\tau$ have a negative net gain from migration and therefore stay. However, since the payoff v^τ in the South depends on whether one is Civic or Uncivic and since $F_c(\cdot)$ may differ from $F_u(\cdot)$, the fraction of migrants in each locality differs between the two types. In particular, the following lemma holds.

Lemma 1 *$\bar{q}_j^c < 0.5\ \forall p_j^S \in [0,1]$ and $\bar{q}_j^u > 0.5\ \forall p_j^S \in [0,1]$ if and only if there is Civicness drain at $p_j^S \in \{0,1\}$.*

Proof. See the Online Appendix. ■

The lemma says that, if (and only if) there is a civicness drain at the extremes of the support of local Civicness, as documented in *Finding* 5, a risk-neutral Civic player ($q_i = 0.5$) will migrate from any locality in the South ($\forall p_j^S \in [0,1]$) and a risk-neutral Uncivic player will always stay. Thus, as a general tendency, we should expect the Civic to migrate while the Uncivic should stay. This is not very surprising given that both types expect the same

[37] That is, $\bar{q}_j^\tau$ is the value for which inequality (6) holds with an equality sign. Note that $\bar{q}_j^\tau$ may be outside the range $(0,1)$, in which case either $\mathbb{M}_{i,j}^{S,\tau} > 0$ for any $q_i \in (0,1)$ or $\mathbb{M}_{i,j}^{S,\tau} < 0$ for any $q_i \in (0,1)$.

payoff in the North while they differ in their payoffs in the South, where the Uncivic free ride the Civic. However, not all players are risk neutral. This raises the following questions: do *all* the Civic migrate along the whole support of the distribution of local Civiciness? And do all the Uncivic stay? The next proposition gives an answer to both questions.

Proposition 2 *If $\alpha\lambda > 1 - E_\phi^S$ and the conditions that produce a Civicness drain at the extremes of the support of local Civicness, i.e. inequalities (7) to (10), hold:*

i. Not all the Civic migrate to North; specifically, the minimum propensity of Civic to migrate is obtained strictly in between the extremes of the support of local Civicness. Moreover, this lower propensity to migrate in between the extremes is driven by the most risk averse among the Civic.

ii. Not all the Uncivic remain in the South; specifically, the maximum propensity of Uncivic to migrate is obtained strictly in between the extremes of the support of local Civicness. Moreover, this higher propensity to migrate in between the extremes is driven by the most risk seeking among the Uncivic.

Proof. See the Online Appendix. ■

As we saw earlier, the conditions in Proposition 1 imply a civicness drain at the extremes of the distribution of local civicness. Proposition 2 presents on top of these a sufficient condition ($\alpha\lambda > 1 - E_\phi^S$) under which migration is not constant along the support. In particular, there is an active role for risk attitudes in determining migration. In the next section we summarize the results of these two propositions and give the intuition for them.

4.5 Recap of the intuition for Propositions 1 and 2

Proposition 1 and 2 rationalize the most novel empirical result of Section 3 which is *Finding 5*. A recap of the intuition for these two propositions is therefore crucial to clarify the contribution of our theory.

Starting with the behaviour of the Civic, first recall that when $p_j^S \approx 0$ a Civic player is surrounded almost only by Uncivic players. Even if she is risk averse, there are so few civic

players in the population that there is no hope in staying in the South. Since the effective cost of migration is lower than the loss from being ripped off by the Uncivic players in the South – inequality (7) – the probability that a Civic type migrates is high in this case. When $p_j^S \approx 1$ instead, a Civic player is surrounded almost only by other Civic players, as it would happen in the North. However, the better quality of public services in the North and the likelihood of being allowed to play there are so high – inequality (9) – that the probability of migration is high as well. Finally, when p_j^S takes intermediate values, Civic players who are relatively risk averse ($q_i < \bar{q}_j^c$) do not migrate because in the South they can still get a reasonable payoff, while in the North they risk not being allowed to play. Therefore, the fraction of Civic migrants is lower than when p_j^S is very high or very low, in particular among the most risk-averse Civic.

As for the Uncivic, note that when $p_j^S \approx 0$ an Uncivic player is surrounded almost only by Uncivic players. Hence, staying in the South is not very attractive, as there is no one to free ride on. However, given that p_j^S is low, an Uncivic player expects the North to believe that South players are Uncivic. Therefore, she believes that the probability of not being given the possibility to play in the North is high. Since the effective cost of migration is larger than the expected fine for shirking from contribution in the South – inequality (8) – the fraction of Uncivic migrants is low. When $p_j^S \approx 1$ instead, an Uncivic type is surrounded almost only by Civic players, as it would happen in the North, so staying in the South is very attractive. And while the probability of being allowed to play in the North is believed to be high because p_j^S is high, the better quality of public services in the North is not sufficiently large to compensate for losing the large payoff from free-riding on Civic players in the South plus the (effective) cost of migration – inequality (10). Therefore also in this case the fraction of Uncivic migrants is low. Finally, when p_j^S takes intermediate values, the relatively risk-seeking Uncivic players ($q_i > \bar{q}_j^u$) migrate because they cannot free-ride on sufficiently many Civic players, while they are willing to take the risk and try their luck in the North, where they have a decent chance to be allowed to play. Therefore, in this case the fraction of Uncivic migrants is higher than when p_j^S is very high or very low, in particular among the most risk-seeking Uncivic.

4.6 Possibility of an uncivicness drain

Proposition 2 opens up the possibility that, even if a Civicness drain is observed at $p_j^S \in \{0, 1\}$, an uncivicness drain takes place at intermediate values of the support of local civicness, if enough Civic stay and enough Uncivic migrate at such values. Whether this possibility materializes in a specific population depends on the intensity of the differences between the risk attitudes of Civic and Uncivic types, as stated in our next and last proposition.

Proposition 3 *Under the conditions that produce a Civicness drain at the extremes of the support of local Civicness:*

i. An Uncivicness drain at intermediate values can occur only if the Civic are sufficiently more risk averse than the Uncivic.

ii. Otherwise, a Civcness drain occurs at all values of local civicness.

Proof. See the Online Appendix. ■

Part (i) of this proposition says that our *Finding* 4 (the Uncivic are more risk seeking than the Civic) is a necessary condition for the second part of *Finding* 5, according to which an Uncivicness drain occurs at intermediate values of local civicness. The rationale behind this result is that risk averse players tend to stay in the South while risk-seeking players tend to migrate, hence risk seeking needs to be sufficiently higher among the Uncivic in order to compensate for the baseline tendency of the Uncivic to stay and of the Civic to migrate.

The second result says that otherwise, and in particular if risk attitudes of Civic and Uncivic types are identical, a Civicness drain would prevail at all levels of local civicness. The reason is simple. Lemma 1 tells us that, for any value of p_j^S, all the risk seeking among the Civic migrate (because even the risk neutral Civic does), while only some of the risk seeking among the Uncivic migrate as well (because the risk neutral Uncivic does not). This holds also at intermediate levels of p_j^S, implying that, if risk attitudes of Civic and Uncivic types are identical, a Civicness drain should be observed also at intermediate levels of local civicness.

5 Conclusions

Many regions around the world, and the South of Italy in particular, are characterised by a substantial heterogeneity of the degree of local civicness across nearby areas within the region. The findings of this paper suggest that migration movements may affect this heterogeneity. This could happen if initial conditions of local civicness induce migration decisions that generate a civicness drain in some places and an uncivic drain in others.

We use data on college choices of Southern-Italian high-school students whom we can classify as Civic or Uncivic on the basis of their behavior in a die-roll experiment. We are also able to measure the degree of local civicness that these students have experienced in one of the most relevant communities in which they have spent time during their youth. This is their high-school class, in which the fraction of Civic peers observed in the same die-roll experiment provides the proxy of local civicness that we need. In this population, we observe a civicness drain only at high or low levels of local civicness, while the Uncivic are more likely to emigrate at intermediate levels.

To rationalize these findings we propose a model that produces different migration patterns for Civic and Uncivic players and predicts that, abstracting from risk attitudes, the general trend would be a civicness drain from South to North. This is because the better enforcement of civic behavior in the North makes migration more attractive for the southern Civic. Since the North is more civic to begin with, as observed in our data, the better enforcement in this region is shown to be an equilibrium result. However, since there is a risk of not being welcomed in the North, the tendency to a civicness drain from the South is attenuated at intermediate values of local civicness, where uncertainty about the chances of being accepted is higher, because of the interaction between the risk attitudes of the two types and their beliefs about what North thinks of their civicness (independently of the truth). This attenuation may even generate an uncivicness drain in the middle of the distribution if the Uncivic are sufficiently more risk-seeking than the Civic, as indeed confirmed in our data.

The novelty and main contribution of this analysis is to establish the possibility of a link between initial conditions of local civicness and the civicness composition of migration flows. This link can explain how migration flows may have shaped the large heterogeneity of

currently observed local civicness in different areas of the South. Such current heterogeneity may be, at least partly, the outcome of the heterogeneous mix of Civic and Uncivic migrants previously leaving each area, a mix that in turn may have been driven by initial conditions of the distribution of local civicness. Exploring this dynamic general equilibrium extension of our static and partial equilibrium analysis comes next in our future research agenda.

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