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A TALE OF AN UNWANTED OUTCOME: TRANSFERS AND LOCAL ENDOWMENTS OF TRUST AND COOPERATION

by Antonio Accetturo*, Guido de Blasio** and Lorenzo Ricci***

Abstract

Transfers can do good; however, they can also result in massive failures. This paper presents a model that highlights the ambiguous nature of the impact of transfers on local endowments of social capital. It then describes an empirical investigation that illustrates that the receipt of EU structural funds causes a deterioration of the endowments of trust and cooperation in the subsidized regions.

JEL Classification: R1, D7, Z1.
Keywords: social capital, political economy, regional transfers.

Contents

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1. Introduction[1]

What happens when a lagging area receives transfers from a centralized authority? Would these transfers be beneficial for the local economy? Would there be any adverse effect?

Answers to these questions are diverse. Advocates of public intervention (see, for instance, OECD, 2009a and 2009b) claim that public funds for economically backward areas are necessary to compensate for a location disadvantage. Opponents of subsidization (see, for example, World Bank, 2009 and Glaeser and Gottlieb, 2009) argue that the rationale for "location-based" policies is theoretically weak, and cite numerous studies showing that aids to local communities are generally ineffective (see, for instance, the review of the literature in Accetturo and de Blasio, 2012).

Among the arguments to refrain from transferring resources to disadvantaged areas, a prominent role is given to political economy mechanisms (see Besley, 2004). Transfers could be harmful because they enhance rent-seeking, increase payoffs for deviant behaviors (such as corruption) and worsen the degree to which citizens are willing to cooperate with each other. By affecting people's perception of the working of economic exchanges, transfers might lead to societies characterized by a poor sense of community and lower interest in the common good (Krueger, 1974).

This paper studies the effect of transfers on local endowments of social capital.[2] It first provides a simple theoretical model that highlights the ambiguous nature of transfers: they might do good

[1] This paper is forthcoming in the *Journal of Economic Behavior&Organization*. This work was partly prepared while Lorenzo Ricci was visiting the Structural Economic Analysis Dept. of the Bank of Italy. We wish to Giuseppe Albanese, Guglielmo Barone, Giovanna D'Adda, Ilaria De Angelis, Alessandro De Chiara, Henry Overman, Francesco Pigliaru, Enrico Rettore, Paolo Sestito, Daniel Sturm, and the participants in the Urban Economics Association meeting in Ottawa (November, 2012), the Bank of Italy conference in Regional Science in Perugia (February, 2013) and university seminars in Roma Tre (January, 2013) and Ancona (February, 2013) for very helpful comments. We also thank Gill Lucy for the editorial assistance. All remaining errors are ours. The views expressed in the paper are those of the authors and do not necessarily correspond to those of the Bank of Italy.

[2] In the paper the word social capital is used to mean the local endowments of trust and cooperation, as captured by the responses at the European Social Survey. In the literature (not only in economics, but also in political science and

and increase local economic activity; they might also be harmful and tempt people to behave selfishly, thus reducing cooperation. Transfers received from a central authority can be used for the provision of a public good that improves the economic conditions of an area; however, mismanagement and fund diversions are possible and local politicians can allow these frauds upon receiving bribes. Individuals face the choice of either behaving in a civic way or becoming uncivic and grabbing (part of) the transfers received by the local government. Results show that transfers may reduce the relative number of cooperative individuals if local governments are characterized by low efficiency in the provision of public goods. Regions with a higher efficiency may observe, instead, an increase in the share of civic individuals.

Empirically, we estimate the impact of the receipt of EU *Structural Funds* (Objective 1) on proxies for the pervasiveness of cooperative behavior at the local level, taken from the *European Social Survey*. These measures refer to trust and cooperative behaviors that are shared across the members of the regional community. Our identification strategy exploits a discontinuity envisaged under the framework for assigning the EU funds: only the European regions below the threshold of 75% of the EU average per capita GDP are allowed to receive the transfers. As the compliance to the assigned funding mechanism is only partial, we adopt a fuzzy *Regression Discontinuity Design* (RDD), which makes use of eligibility as an instrument for participation in the program (Battistin and Rettore, 2008).

Our results show that transfers from the EU generate a sizable reduction of various measures of cooperation and trust at the local level. Evaluated at the eligibility threshold, the receipt of EU funds lowers by half standard deviation all the indicators of social capital. The results are robust

sociology) the term social capital is used with an impressive number of meanings (from networks to civicness, from trust to generalized morality). Guiso et al. (2008) provides for a thorough discussion on the topic.

to a number of sensitivity checks. Consistently with the theoretical model, we also find that high quality of local governments attenuates the negative effects of transfers.

This paper contributes to two distinct strands of literature.

The first strand studies the interactions between social capital and public interventions. According to this literature, individuals' willingness to behave civically is determined by economic, institutional conditions and by the values transmitted by their parents. Bisin and Verdier (2001), Tabellini (2008) and Guiso et al. (2008) present models of intergenerational transmission of values that are, in turn, shaped by economic or institutional incentives (e.g. law enforcement). Glaeser et al. (2007) analyze the impact of schooling on the endowment of social capital. Aghion et al. (2010) and Pinotti (2012) focus instead on the interactions between trust and public regulation; this issue is investigated also by Carlin et al. (2009) in financial markets. In this respect, our contribution is the investigation of the role of the financial transfers to the accumulation/de-cumulation of social capital.

Second, our findings may inform the long-standing debate on the desirability of the EU Cohesion Policy. Indeed, the effectiveness of EU regional financing for regional GDP growth has been questioned by many (Boldrin and Canova, 2001; Sala-i-Martin, 1996). Recently, however, by using an identification strategy similar to the one used here, Busillo et al. (2013) and Becker et al. (2010) have provided new and more encouraging evidence. In these two papers, the receipt of EU Structural Funds is associated with an annual per capita GDP increase of about 1 to 1.5 percentage points over a programming period of 7 years. Our findings add to this literature by showing the relevance of unwanted outcomes.

The remainder of the paper is structured as follows. Section 2 presents a simple model to assess the impact of transfers on cooperation. Section 3 describes the empirics: it introduces the EU

Structural Funds, discusses the datasets, explains the identification strategy, and corroborates them with an extensive number of robustness checks. Section 4 concludes.

2. A simple theoretical model

This section presents a simple model that shows the relationship between transfers (such as the EU Structural Funds) and citizens' endowment of social capital. Like Aghion et al. (2010), we assume that an individual behaves in a civic way when she cooperates with tolerance and mutual respect toward everybody, while she is uncivic if she behaves selfishly outside family (or clan) members. This definition captures the distinction between limited and generalized morality. Limited morality (Banfield, 1958) is applied to a narrow circle of friends and relatives, while norms of generalized morality apply to everyone and induce civic behavior with a larger range of anonymous persons.

Individuals' attitudes toward the general public are usually influenced by a number of factors such as schooling (Glaeser et al., 2007), law enforcement and social fragmentation (Tabellini, 2008) and regulation (Aghion et al., 2010). In this theoretical model, we show that uncivic attitudes can also emerge when a windfall or a transfer from an authority outside the region can be grabbed.

The starting point of the model is that local politicians are selfish and tend to extract rents from their political appointments. The transfers they receive from a central authority can be used for the improvement of the economic conditions of a region; however, controls over the expenditure are imperfect and this may leave room for mismanagement and fund diversion; local politicians can allow these frauds upon receiving a bribe. Individuals face the choice of either behaving in a civic way (i.e. finding employment in the private sector with no negative externalities on others) or becoming uncivic and, thus, trying to grab (part of) the transfers received by the local government by bribing local government representatives. The size of the transfer and the effectiveness of public policies influence the incentives for individuals to behave in a civic way.

2.1 *Model setup*

The timing of the model is as follows.

At time 1, a central authority exogenously determines the size of a transfer to a region and a local government decides how to allocate it. At time 2, individuals decide their status of civicness.

Time 1 – Consider a region with population N. The region is entitled to receive a transfer T by a centralized authority (in our empirical analysis, a trans-national institution: the EU). The local Government (G) decides the share of the transfer, $\lambda \in [0, 1]$, to be dedicated to the provision of a local public good. The remaining share is allowed to be grabbed by uncivic individuals.

Time 2 – Given T and λ, each individual chooses her behavior. She can be employed in a *productive* activity (civic behavior) and, thus, receive a market wage; alternatively, she can decide to become a grabber and, thus, try to bribe the local government with the aim of receiving part of the transfer (uncivic behavior).[3] We index civic individuals by P and uncivic individuals by R. The productive activity benefits from the services of a public good that is financed by the share of the transfer that is not grabbed by individuals R. This implies that the grabbing activity generates a negative externality on civic individuals. The relative numbers of uncivic and civic individuals are endogenously determined in equilibrium ($R + P = N$).

We assume that the local Government utility function is a weighted average of two components. We postulate that G is interested in presenting positive results of its economic policies to either

[3] We therefore model individual civicness as a rational choice, rather than a cultural heritage.

local voters or the representatives of the centralized authority (in order, for example, to avoid fines or liability actions for mismanagement). This implies that one component of the local government's utility function is the effectiveness of public policies. However, we also assume that the local administrators are also "selfish" or corruptible. This implies that they can accept bribes from uncivic people engaged in grabbing activities. In formulas, local government sets its optimal policy λ (i.e. the optimal share of total transfer devoted to public goods) by maximizing the following utility function:

(1) $$\max_{\lambda} W_G = \gamma \ln W + (1-\gamma)\ln B$$

where B is the amount of bribes that G is able to extract from uncivic individuals, W is the economic effectiveness of the policy (i.e. how much public good is effectively provided) and $\gamma \in [0,\ 1]$ represents the weight of the economic effectiveness of the policy in the local Government utility function. γ is a relevant parameter of the model; it can be interpreted as the strength of either citizens' or the centralized authority control over the possible misallocations of public funds. In this baseline model, we treat γ as exogenous; however, we are aware that in the real world it may depend on several factors such as political selection, enforcement of law or voice of local voters in the provision of public goods in the region. We relax this simplifying assumption in the Appendix by linking γ to the local endowment of social capital, without relevant changes to the results.

Let us now turn to the citizens. Let α be the share of civic individuals in the economy.

Once an individual decides to be uncivic, she tries to grab a share of the transfer upon paying a bribe to *G*. The size of the bribe is defined according to a bargaining model with infinite alternate offers and symmetric discount rate δ (Rubinstein, 1982). We assume that G makes the first offer. This implies that the bribes received by G from all uncivic individuals is equal to $B = \frac{1-\lambda}{1+\delta}T$, while the amount each individual *R* gets is $w_R = \frac{1-\lambda}{1+\delta}\frac{T\delta}{(1-\alpha)N}$.

The productive sector is perfectly competitive and characterized by the following production function:

(2) $$Q = W \ln \alpha N = (\lambda T)^{\rho} \ln \alpha N$$

where Q is a numeraire good, $W = (\lambda T)^{\rho}$ represents the service flow provided by the public sector, $\rho > 0$ is a parameter representing the returns to scale in the public good production, and αN is the total number of workers. Perfect competition in the labor market implies that wages are always equal to the marginal product of labor: $w_P = \frac{(\lambda T)^{\rho}}{\alpha N}$. The higher the flow of public goods provided by the Government, the higher the wage for all the productive individuals.

2.2 *Solving the model*

The model is solved by backward induction. In the second stage an individual decides to be either *P* or *R* for a given λ by comparing her payoffs. This implies that:

(3) $$\alpha = \begin{cases} 0 \text{ if } w_R > w_P \\ \in (0,1) \text{ if } w_R = w_P \\ 1 \text{ if } w_R < w_P \end{cases}$$

Given our assumptions on the production function, $\lim_{\alpha \to 0} w_P = \infty$; this implies that α=0 is never an outcome.

The internal equilibrium is obtained by equating w_R and w_P. The equilibrium share of producers in the economy is:

(4) $$\alpha^* = \begin{cases} \dfrac{(\lambda T)^\rho}{(\lambda T)^\rho + \dfrac{1-\lambda}{1+\delta}\delta T} & \text{if } \lambda < 1 \\ 1 & \text{if } \lambda = 1 \end{cases}$$

Equation (4) shows the equilibrium share of civic individuals for a given policy λ. When λ<1, the higher the economic effectiveness of the policy, the larger the share of individuals of type *P*; the higher the returns from grabbing and bribing, the lower the share of individuals that decide to be civic. Finally note that α=1 only if λ=1; this implies that the share of individuals of type *R* is equal to zero only if the share of the transfer the policymaker devotes to grabbing is nil.

Let us now turn to the first stage of the analysis.

Given (4) and the size of the bribe paid by uncivic people, equation (1) can be rewritten as:

(5) $$\max_{\lambda} W_G = (1-\gamma)\ln\left(\frac{1-\lambda}{1+\delta}T\right) + \gamma \ln(\lambda T)^{\rho}$$

The first order condition for equation (5) is as follows:

(6) $$\frac{\partial W_G}{\partial \lambda} = -\frac{1-\gamma}{1-\lambda} + \frac{\gamma\rho}{\lambda} = 0$$

Note that if γ<1, $\lim_{\lambda \to 1} \frac{\partial W_G}{\partial \lambda} = -\infty$. This implies that, if the government is (at least slightly) selfish, it will always choose to devote a share of the transfer to grabbers. Moreover, the facts that $\frac{\partial^2 W_G}{\partial \lambda^2} < 0$ and $\lim_{\lambda \to 0} \frac{\partial W_G}{\partial \lambda} = +\infty$ ensures that the equilibrium always exists and is unique.

Optimal policy can now be obtained by solving equation (6) as:

(7) $$\lambda^* = \frac{\gamma\rho}{\gamma\rho + 1 - \gamma}$$

Equation (7) shows that the share of the transfer invested in productive activities is high if the effectiveness of the local public good (ρ) or the government's interest for total welfare (γ) are large. It should be noted that the optimal share of transfers invested in productive activities is independent of the size of the transfers. This is basically due to government's preferences (summarized by the parameter γ), that are assumed to be independent of the level of civicness of the population. By adopting a more general utility function in the Appendix, we find that the size of the transfer negatively impacts on λ^*, as found also by Brollo et al. (2013). It should be noted, however, that this extension, which unduly complicates the analytics of the model, does not change the results of the next section.

2.3 Transfers and civicness

This simple model has an interesting implication. Transfers can change individuals' incentives to behave civically. To see this point we substitute (7) into (4) and take the derivative with respect to *T*:

$$\frac{\partial \alpha^*}{\partial T} < 0 \Leftrightarrow \rho < 1 \tag{8}$$

The Appendix provides the analytical derivation of this condition. Equation (8) shows that transfers have a negative effect on the share of individuals that decide to behave civically if and only if there are decreasing returns to public funds. In other words, only those transfers made to regions with a low effectiveness of the local public good ($\rho < 1$) will decrease the number of citizens that choose to be civic and find employment in the productive sector.[4] This result is intuitively appealing for the simple reason that transfers are likely to raise the returns of both rent-seeking and cooperative activities. If funds are not particularly effective ($\rho < 1$), the payoff for producers increases relatively less than that for grabbers. This changes the relative incentives to behave civically.

[4] This upshot resembles the Burnside and Dollar (2000) argument, according to which aids are only effective in the presence of good local economic institutions. A similar intuition is developed by Becker et al. (2013) according to which the absorptive capacity of aids crucially depends on the quality of institutions.

An interesting implication of this result is the possible existence of heterogeneous effects of across regions. In areas in which the quality of government is particularly high, we expect that transfers increase the share of civic individuals, while regions whose governance is more problematic will observe a deterioration in the share of productive individuals. We will exploit this feature in the empirical part.

Note that for some parameter configurations the model allows divergent paths for growth and social capital. For instance, let us proxy the total GDP of a region with the sum of all returns in the economy (a proxy for consumption): $GDP = (1-\alpha)Nw_R + \alpha Nw_P$. It is easy to show that $\frac{\partial GDP}{\partial T} = \frac{(1-\lambda^*)\delta}{1+\delta} + \rho\lambda^* T^{\rho-1} > 0$ even if $\rho < 1$. For $\rho < 1$, transfers from central authorities can simultaneously raise per capita income and reduce cooperative behavior among citizens.

3. Empirics

This section provides an empirical estimate of the effects of transfers on the local endowments of trust and cooperation. We first (Section 3.1) describe the EU transfers, on which the exercise is focused, and then illustrate (Section 3.2) the data. Next (Sections 3.3-3.5), we explain the regression discontinuity identification strategy and present (Sections 3.6 and 3.7) the results.

3.1 *EU transfers*

The aim of EU Structural Funds is to reduce regional disparities (in terms of income, wealth, and employment opportunities) and foster long-run sustainable growth (European Commission, 1997, 2001, and 2007). To this program, started in 1988, is allocated the lion's share of the European fiscal equalization transfers. For the programming period 2000-2006, the one for which we can match information on local endowments of trust and cooperation (see Section 3.2), it amounted to one third of the total EU budget.

Structural funds are allocated according to three mutually exclusive objectives: 1) *Objective 1* (in 2007 renamed the Convergence Objective), aimed at poor regions with the aim of accelerating the convergence process across Europe; 2) *Objective 2* (renamed the Regional Competitiveness and Employment Objective), aimed at regions with socio-economic problems (basically, unemployment) due to de-industrialization; *Objective 3* (renamed the Territorial Cooperation Objective), aimed at promoting the accumulation of human capital.

In this paper we concentrate on Objective 1 for two reasons. First, the resources allocated for this program account for the largest part (roughly 70% in the programming period 2000-2006) of the Structural Funds budget. The amounts involved were considerable: over this period, average transfers amounted to 1.1% of the recipient regions' GDP (per capita transfers amounted to 229 euros). Therefore, this very generous funding is more likely to trigger the economic mechanisms highlighted in Section 2 than less generous EU programs. Second, the scheme offers a quasi-experimental framework, which we exploit to identify the causal effect of funding: a region (defined at the NUTS2 level) qualifies for the transfers if its per capita GDP (measured in PPP) falls below 75% of the EU average.[5] Note, however, that compliance to the qualifying scheme is only imperfect: a bargaining process, intended to adapt the 75% rule to additional constraints of a political nature, takes place between EU authorities and national governments. As matter of fact, in the programming period 2000-2006 (Table 1), 17 non-eligible regions were added to the list of beneficiaries (for instance, Sachsen in Germany,

[5] To determine eligibility, the available data for the three years prior to the time of the decision are used.

Comunidad Valenciana in Spain, and Sardegna in Italy) even though their per capita GDP was above the 75% cutoff, while 1 region (Cantabria in Spain) was excluded despite its eligibility.

3.2 *Data*

Our outcomes are taken to be the measures of local endowments of trust and cooperation available in the European Social Survey (ESS). The ESS is a biennial cross-sectional survey that covers a large sample of European nations. The project was inspired and initiated in the 1990s by the European Science Foundation and funded by the European Commission and national Research Councils throughout Europe. The survey aims at monitoring values, attitudes, behavior patterns and opinion on a wide range of social items. The first ESS wave was conducted in 2002 (subsequent waves were run in 2004, 2006, 2008, 2010 and 2012). As no alternative information on social capital endowments at the regional level is available before 2002, we are forced to focus on the 2000-2006 programming period of the Convergence Objective.

To measure the local endowments of trust and cooperation, we consider three indicators:

Trust. Taken from the responses to the question "Generally Speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?". Answers are recorded on an 11-point scale from "you can't be too careful" (coded as 0) to "most people can be trusted" (coded as 10).

Fair. In this case the question is "Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?". Answers are recorded on the scale from “most people would try to take advantage of me” (coded as 0) to “most people would try to be fair” (coded as 10).

Help. Taken from responses to “Would you say that most of time people try to be helpful or that they are mostly looking out for themselves”. Answers are recorded on the scale from “people mostly look out for themselves” (coded as 0) to “people mostly try to be helpful” (coded as 10).

Two aspects of these indicators should be noted.

First, they are measured on the basis of survey responses. The validity of these responses can be questioned. For instance, Bertrand and Mullainathan (2001) argue that subjective survey data may be biased due to cognitive effects (the order of questions, the wording, and the mental effort required to answer) and to the issue of social desirability (which arises when respondents wish to look good in front of interviewers). As for the measures of trust, Glaeser et al. (2000) show that the answers to the trust question are not correlated with actual trusting behavior, as measured experimentally. More recent studies, however, reveal quite the opposite results (see Bellemare and Kröger, 2007, and Sapienza et al, 2013). It is important to note that, notwithstanding the limitations of survey data, no superior alternative seems to be available, as measuring trust experimentally may also have some shortcomings (for instance, limited representativeness, experimental biases, cost-effectiveness, etc. (Morrone et al 2009, Akçomak and Weel, 2009, and Freitag and Kirchner, 2011).

Second, the three indicators are generally highly correlated (pairwise correlation coefficients range from 0.87 to 0.89). This suggests that they are different proxies of the same phenomenon; in order to highlight their similarities, we use a measure of the three. This route is followed below by extracting the first principal component of the three variables (*PC1*). PC1 can be thought as a synthetic measure of the local endowments of trust and cooperation (PC1 explains 92% of the total variability in the data). However, the correlation between responses to the three questions is far from perfect. This means that each indicator carries some independent information; thus it could also be valuable to analyze the indicators independently. For instance, Fehr (2009) argues that responses to the *Trust* question might capture two distinct aspects: preferences (both risk and social preferences, i.e. social aversion) and beliefs about people's trustworthiness. In this regard, indicators such as *Fair* and *Help* might be considered more shielded from risk and social aversion (that is, more related to the beliefs about people's trustworthiness).[6]

Individual responses to ESS questions are aggregated at the regional level by using sample weights provided in the dataset.

Two issues regarding our dataset should be noted. First, the ESS usually provides the NUTS2 level identification for the respondent. For some countries (Belgium, Germany, France, and the UK), however, only the (less detailed) NUTS1 level is available. This may complicate our analysis since Objective 1 regions are defined at NUTS2 level. Therefore, if a NUTS1 region includes both treated and non-treated areas (as is the case for the NUTS1 of Scotland and Wales

[6] The distinction is particular relevant when it comes to policy: "preferences are not easily malleable (…). Nor it is clear whether implementing policies that deliberately aim at shaping people's preferences is desirable." (Fehr, 2009, p. 260).

in the UK), those observations have to be discarded due to the impossibility to allocate them to either the treated or the non-treated group. The issue is less relevant for NUTS1 regions that do not include both treated and non-treated regions (as is the case for the NUTS1 regions of Belgium, Germany and France). We decided to keep them in the empirical analysis (however, our results are basically the same discarding those regions as well).

The second issue is related to the fact that not all regions are included in all ESS waves. To cope with this issue, the solution we adopted is to make use in the analysis of the average regional values for all available waves. This leaves us with 168 regions, 84 of which are treated.

Table 2 shows the average values of the social capital indicators for treated, non-treated regions and for the entire sample. Mean differences between treated and non-treated regions is also provided. Compared with the non-treated, treated regions have an average score that is lower by almost 1 point. This is not surprising since lower social capital is usually associated with economic backwardness, which, in turn, determines eligibility status. Social capital indicators seem also to have clear national patterns. For example, Trust scores in Denmark are almost twice as those reported in Greece. This is not surprising given the role of institutions in shaping Social Capital endowment. It should be noted, however, that those indicators are characterized by a large within-country variability (see, e.g., Spain, Italy or Belgium); this feature will be exploited in the empirical part.

The ESS dataset at regional level is merged with other data sources. We use the official archive of Objective 1 regions, released by the European Commission. We also make use of the Regio-Eurostat dataset, which provides us with the figures on per capita GDP which are necessary to calculate the eligibility status and the forcing variable in the regressions, and with a number of covariates used to control how the sample is distributed around the threshold.

3.3 *Identification strategy*

We now briefly describe the econometric strategy we adopted to identify the effect of European funds on local endowments of trust and cooperation: the regression discontinuity design (RDD). The main idea behind this research design (Angrist and Lavy, 1999; Black, 1999; and Van der Klaauw, 2002) is that regions just below the 75% cutoff (eligible regions) make good comparisons with those just above the cutoff (non-eligible regions). This strategy is deemed preferable to other non-experimental methods because (Lee, 2008) if the units of the analysis (in our case the European regions) are unable to manipulate precisely the forcing variable (GDP per capita as a percentage of the EU average), then the variation in treatment (the receipt of EU Structural Funds) around the threshold is randomized as though in a randomized experiment (as if the regions had been randomly drawn just below or just above the threshold).

As explained in Section 3.1, the EU institutional setup is such that there is not a perfect overlap between eligibility and treatment: in particular, following a negotiation process between national states and EU authorities, 17 non-eligible regions were included in Objective 1, while 1 eligible region was excluded. Empirically, this circumstance calls for the adoption of a fuzzy RDD, where assignment to treatment depends on the forcing variable in a stochastic manner.

Our general setting can be described as follows. Let Y, the outcome variable, and D, a binary treatment status denoting participation in the program, be a function of (Z, U); Z is the forcing variable for eligibility and U represents a set of unobservable regional characteristics (i.e. the outcome of negotiations between national states and EU authorities), possibly correlated to our measures of social capital. The fuzzy regression discontinuity estimator can be written as follows (Trochim, 1984, 2001; Hahn et al., 2001):

$$\beta = \frac{\lim_{Z \to 75^-} E[Y|Z=75] - \lim_{Z \to 75^+} E[Y|Z=75]}{\lim_{Z \to 75^-} E[D|Z=75] - \lim_{Z \to 75^+} E[D|Z=75]} = \frac{ITT}{\lim_{Z \to 75^-} E[D|Z=75] - \lim_{Z \to 75^+} E[D|Z=75]} \tag{9}$$

where the numerator, usually called Intent to Treat (ITT), is the effect of eligibility on the final outcome and the denominator is the difference between the probability to be treated as eligible and the probability to be treated as non-eligible. All quantities in eq. (9) are computed around the threshold of 75% of the EU average GDP per capita.

β is defined as the Average Treatment Effect on the Treated (ATT). It should be noted that ITT represents a causal estimator of the effects of the policy. However, it is not a precise one since it does not take into account mis-assignments to treatment around the threshold. However, it will be used in one of the robustness checks we present below.

3.4 *Challenges to Identification*

β can be interpreted as an instrumental variable estimator, where treatment is instrumented by eligibility. Its causal interpretation rests on two basic assumptions: (i) monotonicity and (ii) exclusion restriction.

The first condition states that the likelihood to be treated above the 75% threshold is less than that below that threshold. Figure 1 shows how this is also fulfilled since the probability to be treated below the 75% threshold is significantly larger than that above the threshold.

The fulfillment of the second condition is less straightforward; according to the exclusion restriction hypothesis, β captures the effect of Objective 1 transfers only if other policies do not share the same discontinuity. From a legal point of view, this condition is fulfilled since the remaining objectives of European Structural Funds are designed with other eligibility criteria (see Section 3.1). As matter of fact, however, the EU objectives are mutually exclusive; therefore, one might worry that Objective 2 regions could overwhelmingly cluster just above the eligibility threshold; this may create an attenuation bias in the estimates as non treated also receive some sorts of treatment (although the Objective 2 program was definitely less generous in terms of disbursements: Section 3.1). As we checked, Objective 2 regions do not seem to concentrate in the vicinity of the 75% cutoff (this is largely explained by the fact that the regions that overshoot the eligibility threshold by a small amount of per capita GDP were kept into Objective 1 as a result of the negotiation process). In any case, our estimates are to be considered as the impact of the Objective 1 funds on Objective 1 regions, allowing for the potentially endogenous response of other policies that have occurred over the time period in question.[7]

We further consider two additional characteristics in the design of the policy that are likely to create confounding factors in the analysis.

The first is the possibility that regions treated in the 2000-2006 period were already under treatment in one of the previous waves of the Objective 1 program. As described in Section 3.1, the Objective 1 program started in 1988: this implies that, at the start of the 2000-2006 programming period, some regions might have been under treatment for several years. If this characteristic were balanced across the threshold, this would not be an issue. If, instead, regions

[7] See Kline and Moretti (2014) for similar considerations.

that were treated in the past cluster below (above) the 2000-2006 eligibility threshold, our estimates might be upward (downward) biased. As a matter of fact, close to the eligibility line, treated areas for the 2000-2006 wave had, on average, 6 years of past treatment more than non-treated regions and this difference is statistically significant. In order to cope with this issue, we consider the past treatment as a characteristic that influences the dependent variable and does not balance over the threshold. For this reason we insert a set of year-under-past-treatment dummies in all regressions.[8]

The second relates to the role of the country-level institutional framework in shaping the social capital endowment. As shown by the theoretical model, individuals' choice of being civic or uncivic also depends on the local institutional framework that shapes the local government preferences (parameter γ). A possible concern in our empirical setting is that European countries are characterized by stark differences in the quality of institutions. If, for example, all Greek or Italian regions sort below the threshold and all Swedish or Danish areas are above, we actually make a comparison of Greek or Italian institutions against the Swedish or Danish ones. This is a clear violation of the exclusion restriction and invalidates the identification of a causal effect. We deal with this problem by inserting country dummies.

3.5 *Estimation*

Practically, β is estimated with the following equation:

(10) $$Y_i = \sigma + g(Z_i) + D_i[\beta + g(Z_i)] + \kappa_1 D_c + \kappa_2 D_T + \varepsilon_i$$

[8] We include three dummy variables for, respectively, 5, 6, and 11 years of past treatment.

Where the treatment variable D_i is instrumented by a dummy equal to one when region *i*'s per capita GDP as a percentage of the EU average is below 75% with a linear probability model. g(.) represents a polynomial of the forcing variable Z. D_c and D_T represent, respectively, the country and years under past treatment dummy sets.[9]

3.6 *Results*

A graphical illustration of the effect of the discontinuity in the eligibility is represented in Figure 2 and Figure 3 by plotting the kernel estimates of each social capital indicator against the forcing variable.[10] Red dots represent average values; blue dots provide, instead, the 95% confidence intervals. In all the graphs there is a clear evidence of a jump in the local endowments of trust and cooperation at the 75% threshold: Objective 1 eligibility is associated with a clear drop in the social capital at regional level. Confidence intervals also suggest that the effect is statistically significant

However, graphical representation is not able to provide a precise measure of the magnitude and significance of the coefficient. This is due to both the fuzzy nature of the design (i.e. several regions above the threshold are treated) and the presence of other confounding factors like past treatment and country effects. For this reason we switch to parametric estimates by using the eligibility rule as an instrument for the treatment. Tables 3A and 3B report our baseline results. In each cell we show the estimates of the impact at the threshold for different degrees of polynomial g(.); the polynomial is allowed to vary in a different way below and above the

[9] Most regression discontinuity analyses complement parametric estimates with local polynomial regressions. However, these methods are consistent only with very large datasets and our limited sample size does not allow a satisfactory use of them.

[10] We use the Epanechnikov kernel with rule-of-thumb bandwidth (Lee and Lemieux, 2009).

threshold and ranges from the first to the third order.[11] Each boxed row reports the result for a different dependent variable.

Estimates show that the impact at the threshold is negative for all the dependent variables. The Akaike Information Criterion (AIC) shows that the first-order polynomial (on both sides of the threshold) is the best specification for Trust, Help and PC1, while a first-order for non-eligible and a second-order for eligible regions ensures the best fit for Fair. In those best specifications, the negative effect is statistically significant for all indicators except for Help. As for the magnitude of the treatment effect, being treated as an Objective 1 region lowers the local endowments of trust and cooperation by about half of standard deviation (0.5 points over an 11-point scale). This is confirmed even when we use PC1 as a synthetic indicator. All in all, these results seem to give strong support to the idea that fiscal transfers might jeopardize local endowments of trust and cooperation.

The instrument is very strong. In table 3C we report the marginal effect of the instrument over the treatment variable and the first stage *F*-statistic for the best specifications. Marginal effects ranges between 0.72 and 0.73 and they are always statistically different from zero; moreover, all *F*-statistics are larger than 10, which represents the minimum value identified by Stock and Yogo (2005) to detect a weak instrument.

Table 4 presents some robustness checks.[12]

[11] Higher order degrees provide similar results.
[12] In what follows, all regressions are run by using the best specifications identified by AICs.

The first (column 1) relates to the role of the outliers. Outliers far from the threshold should not be troublesome because in the RDD framework their presence would affect the coefficients of the polynomial but not the estimates of β. This cannot be the case, however, when outliers are close to the threshold. In order to deal with this possibility, we eliminate for each regression all the observations below and above, respectively, the 1st and the 99th percentile of the distribution of the dependent variables. Results remain undisputed.

In the second check, we implement a number of placebo experiments. The unavailability of ESS data before 2000 might still leave a reader with the doubt that we are erroneously capturing nothing else than the positive relationship between development (measured by per capita GDP) and the endowments of trust and cooperation. We try now to eliminate any doubt in this regard. The idea is the following: if the relationship between development and ESS measures is what is really driving our results, this relationship should materialize not only at the 75% cutoff, but also for different thresholds of the forcing variable. Therefore, by comparing the ITT at the true cutoff of 75% with alternative ITTs at faked thresholds, we should be unable to detect any difference.[13] Columns from (2) to (4) of table 4 present the results. Column 2 displays the estimates for the ITT at the 75% threshold. As expected, compared to the ATT, point estimates are lower but they are still highly significant.[14] Columns (3) and (4) show the ITT estimates for two faked thresholds, 63 and 101%, which represent, respectively, the median value of the regional GDP as a percentage of the EU average for those below and above the 75 per cent threshold.[15] Contrary to what we find for the true cutoff, the estimated parameters are very small and never statistically significant.

[13] Clearly, the placebo experiment cannot be done with the ATT, since the monotonicity condition is violated away from the 75th per cent threshold and the denominator in eq. (9) is zero.
[14] As eq. (9) shows, ITT is always lower than the ATT.
[15] As we checked, different fake thresholds would deliver similar results.

One implication of the local randomized result is that RDD can be tested like randomized experiments. If the variation in the treatment near the 75% threshold is approximately randomized, it follows that all covariates that are likely to be associated with social capital endowment (see, for example, Albanese and de Blasio, 2014) should have about the same distribution just above and just below the threshold. Therefore, to check whether some confounding factor is driving some spurious correlation, it suffices to run regressions of the type of equation (10) above using as dependent variables those factors that the researcher suspects could be driving the results. If no effect is detected, then that variable can be considered as controlled for in the RDD exercise. Ideally, crucial baseline covariates that we want to show are – before the program started in 2000 – locally balanced on either side of the cutoff are the local endowments of trust and cooperation. Unfortunately, this is precluded by the availability of the data because the first wave of the ESS is that of 2002. To deal with this issue, we take a number of steps.

First, we show in Table 5 that a wide number of baseline covariates, whose values refer to pre-2000 years, are locally balanced. We focus on measures of infrastructure endowments (motorways per capita and railways per capita), geographical characteristics (distance from the North Pole),[16] population density, demography indicators (old population share, net birth rate, net migration rate), life expectancy, crime rate, and labor market and education (employment rate and the share of total students over population aged 6-24). The results (which are derived from both best specifications) show that only railways per capita and net migration rate present a slightly statistically significant discontinuity at the 75% threshold. As explained by Lee and Lemieux (2009), some of the differences in covariates across the threshold might be statistically

[16] See Gallup et al. (1999).

significant by random chance. To check for this possibility, we combine the multiple tests into a single test statistic that measures whether data are broadly consistent with the random treatment hypothesis around the cutoff. We carry out a χ^2 test for discontinuity gaps by estimating Seemingly Unrelated Regressions (SUR), where each equation represents a different baseline covariate. In none of the equations is there any evidence of discontinuities.[17]

3.7 *Quality of government and heterogeneous responses*

The results displayed so far undoubtedly point to the direction that transfers have a negative causal effect on the social capital endowments at regional level.

However, the theoretical model presented in Section 2 shows that the relationship between transfers and citizens' behavior crucially depends on the economic effectiveness of the transfers (see equation (8)). When effectiveness is low, the share of individuals that behave in a civic way decreases; when the economic returns to public funds are high, citizens prefer to be employed in a market activity. This calls for the possibility of heterogeneous effects of the transfers across regions featured by different degrees of policy effectiveness.

In our RDD framework, heterogeneity is detected by adopting the methodology proposed by Becker et al. (2013). We first identify an empirical counterpart for the theoretical variable ρ by using a measure of "quality of government" (Q), which should drive heterogeneity according to the model of Section 2. Then we use it as an additional forcing variable in the estimates of equation (10). Formally, we estimate:

$$Y_i = \sigma + g(Z_i) + h(Q_i) + D_i[\beta + g(Z_i) + h(Q_i)] + \kappa_1 D_c + \kappa_2 D_T + \varepsilon_i \tag{11}$$

[17] Results are available from the authors.

Where h(.) is a polynomial for the additional forcing variable, and the variables of interest are the coefficients of the interaction terms between D_i and $h(Q_i)$, under the hypothesis that Q is continuous at the 75% threshold.

As in Becker et al. (2013), data on regional Quality of Government (QOG) are taken by Charron et al. (2014), which use a perception-based indicator based on 34,000-respondent survey throughout the EU. Their dataset covers 27 EU countries and 172 NUTS1 and NUTS2 regions.[18] The overlap with our dataset is almost perfect as we have information on 164 out of the 168 regions included in the sample for our previous estimates. The QOG measure is based on 16 survey questions pertaining the perceptions on *quality*, *impartiality*, and *corruption* of three key public services: education, health, and law enforcement. Operationally, we make use of two indicators of QOG. The first (referred to as QOG1, or broad definition) is the average of the perceptions on quality, impartiality, and corruption across the three public services. The second (referred to as QOG2, or narrow definition) includes only the perceptions of quality for the three public services. In principle, this latter proxy should capture more the aspects related to the provision of public services, which are shielded form the deterioration of the local endowment of trust and cooperation.

It should be noted, preliminarily, that both QOG1 and QOG2 are continuous at the 75% threshold. This is shown in table 5 for both the best specifications of dependent variables.

Estimates for equation (11) are displayed in Table 6 for the first-order polynomial of $h(Q_i)$.[19]

As in the baseline estimates, in all specifications β is still negative and it remains significant for all social capital indicators (except for Help). As predicted by the theoretical model, the

[18] The dataset is freely downloadable at the following URL:
http://www.qog.pol.gu.se/data/datadownloads/qogeuregionaldata/

[19] Becker et al. (2013) also use the first-order polynomial. Higher-orders provide similar results but are much more difficult to interpret.

interaction term between D_i and QOG1 and QOG2 is positive and significantly different from zero (Help is again the only exception in terms of statistical significance).

Some back-of-the-envelop calculations helps in understanding the real magnitude of the heterogeneity driven by the quality of government. A standard deviation increase in QOG1 reduces the effects of transfers on Trust from -0.404 to -0.166. The effects of QOG2 is even stronger and drives the negative effect to zero.[20] All in all, the results suggest that the effectiveness in the provision of public goods has a key role in countervailing the potentially detrimental effects of the transfers on the local endowments of social capital.

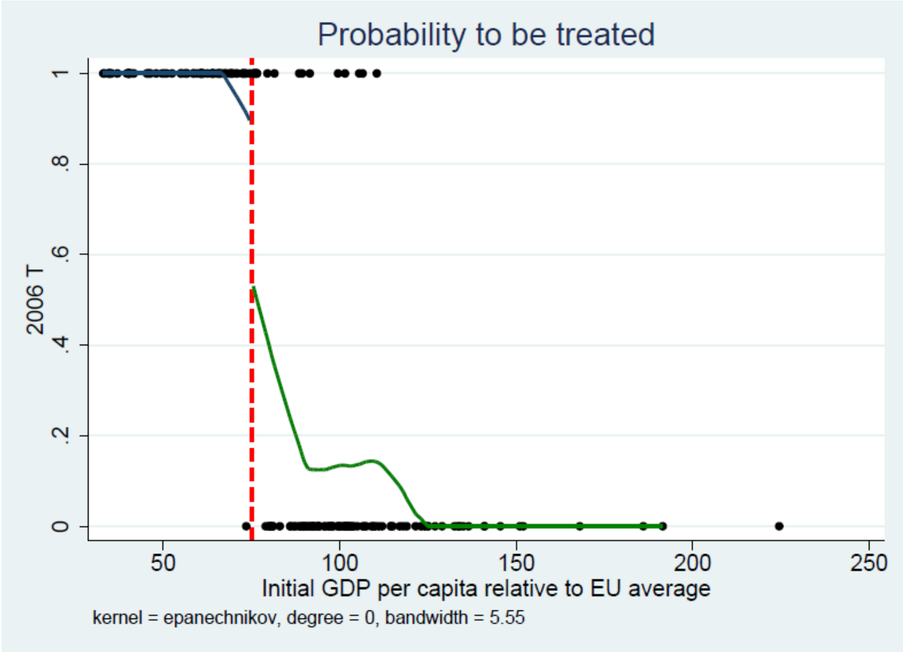
4. Conclusions

The aim of this paper has been to assess the consequences of fiscal transfers to a lagging area in terms of citizens' perceptions of the local extent of uncivic behaviors. By using a regression discontinuity design for the EU Structural Funds Objective 1, we find evidence that the transfers reduce local endowments of trust and cooperation. While other explanations are possible, the model we have proposed suggests that the decrease in local endowments of social capital might be due to the fact that aid goes to regions with poor effectiveness of local public goods.

Our analysis suggests that in the design of the EU cohesion policy, more emphasis should be given to the pre-requisites for the receipt of aid, among which the effectiveness of local public goods should have a prominent role. Indeed, the current debate on how to reform the policy is considering to include ex-ante conditionality measures for the Programming Period 2014-2020. Our results imply that these steps will be in the right direction.

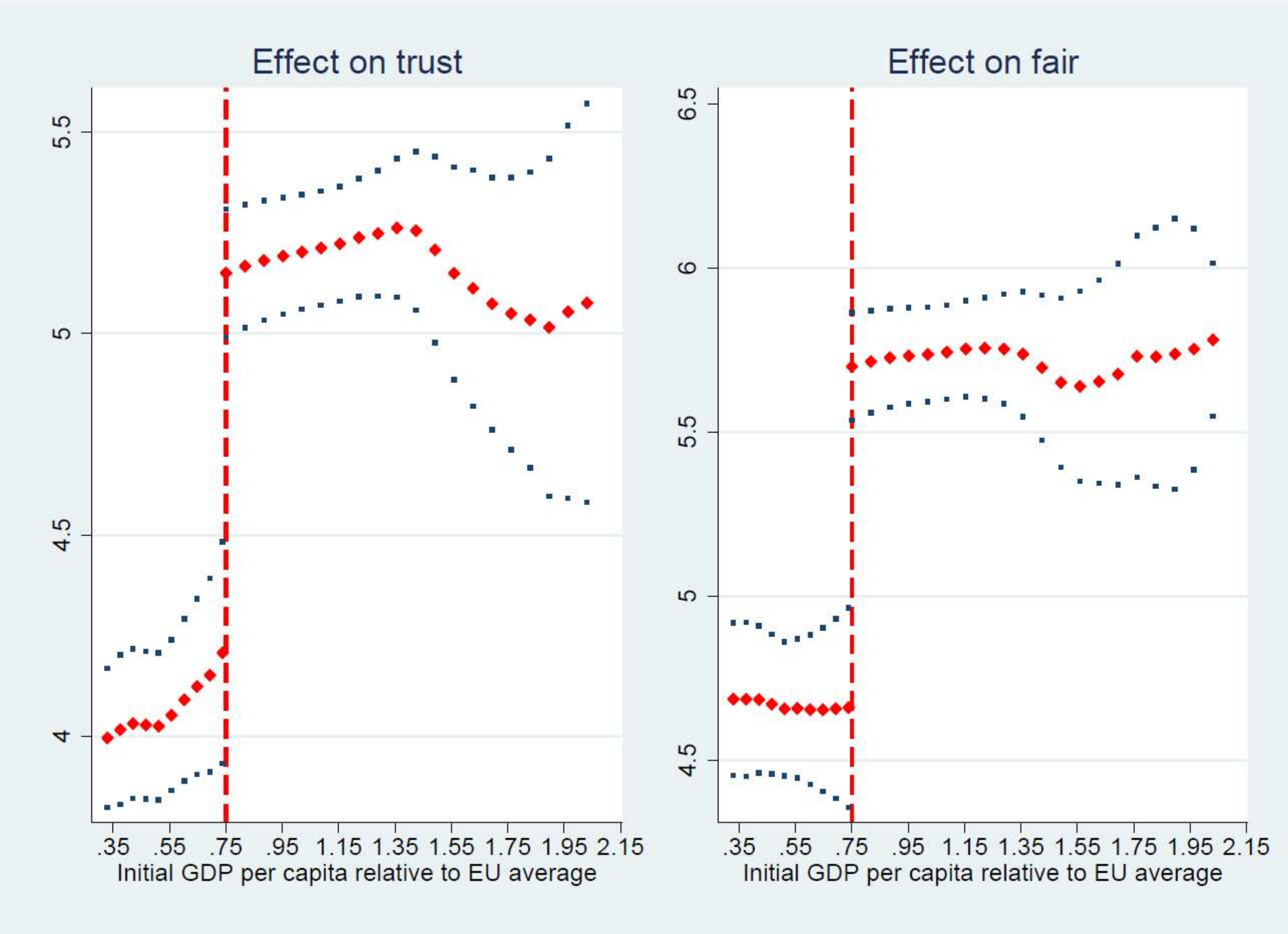
[20] Standard deviations for QOG1 and QOG2 are, respectively, 1.05 and 0.97.

Figure 1. Monotonicity condition



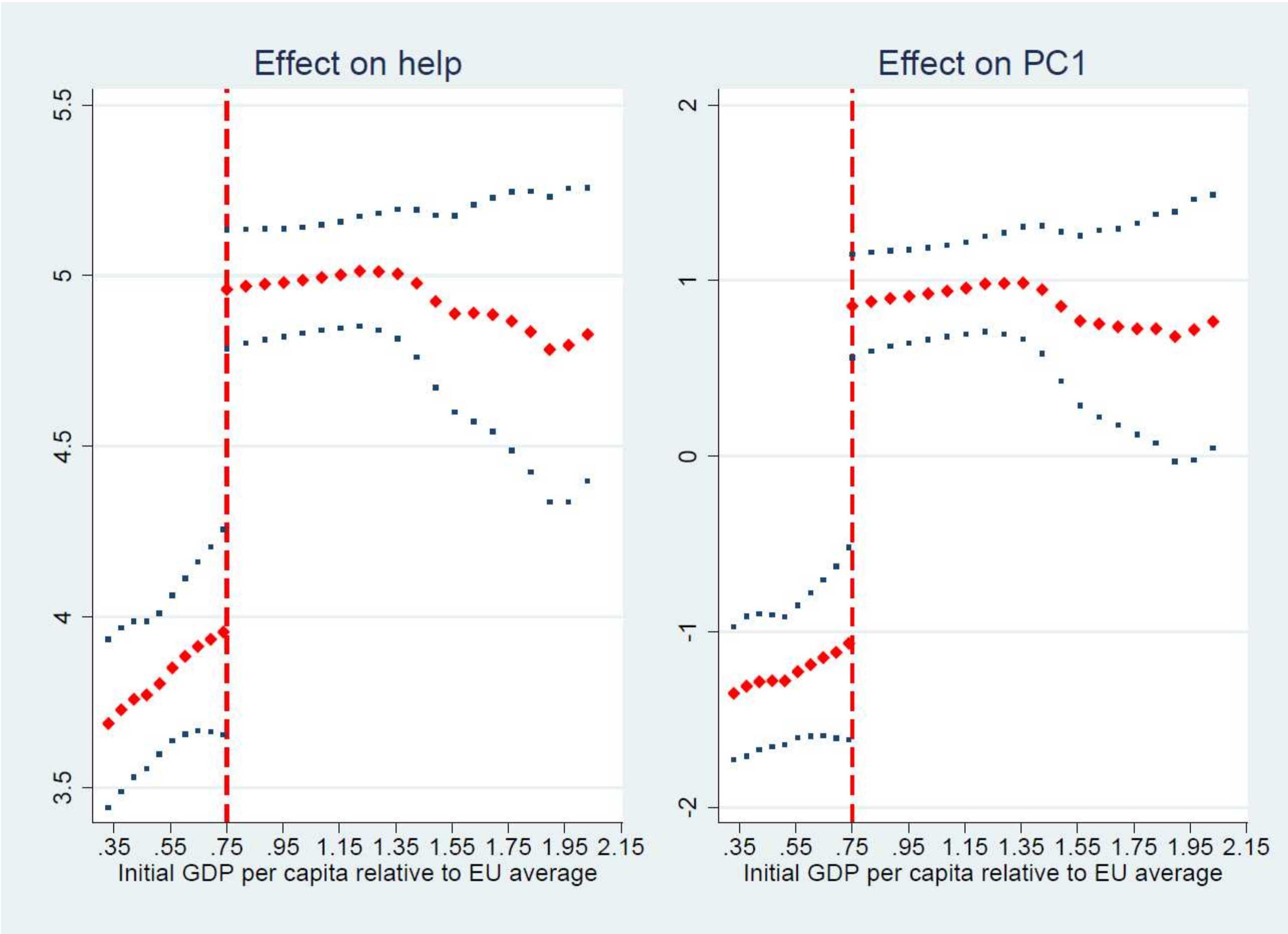
Note: The graph represents a local polynomial smooth; based on Epanechnikov kernel with rule-of-thumb bandwidth.

Figure 2. Graphical analysis on Trust and Fair



Note: The graph represents local averages of the dependent variables, based on Epanechnikov kernel with rule-of-thumb bandwidth. Blue dots represent 95% confidence intervals.

Figure 3. Graphical analysis on Help and PC1



Note: The graph represents local averages of the dependent variables, based on Epanechnikov kernel with rule-of-thumb bandwidth. Blue dots represent 95% confidence intervals.

Table 1. Eligibility and actual recipient regions

	Total Sample	
	Recipient	**Non-recipient**
Eligible	67	1
Non-Eligible	17	83
Total	84	84

Sources: European Commission 1999 and 2003.

Table 2. Social capital indicators in European regions

	Trust	Fair	Help
Sample Average	4.718 (0.872)	5.272 (0.894)	4.491 (0.945)
Mean treated	4.249 (0.834)	4.799 0.907)	4.018 0.948)
Mean non-treated	5.187 (0.624)	5.744 (0.578)	4.964 (0.668)
Mean Difference (treated-non treated)	-0.938 [0.113] ***	-0.945 [0.117] ***	-0.946 [0.126] ***
Country differences:			
Austria	5.139 (0.236)	5.784 (0.143)	5.329 (0.249)
Belgium	4.769 (0.483)	5.634 (0.232)	4.276 (0.599)
Czech Rep.	4.309 (0.268)	5.204 (0.284)	4.097 (0.204)
Germany	4.674 (0.270)	5.770 (0.143)	4.879 (0.175)
Denmark	6.923 (-)	7.323 (-)	6.097 (-)
Estonia	5.309 (-)	5.613 (-)	4.749 (-)
Spain	4.753 (0.879)	5.123 (0.736)	4.199 (0.772)
Finland	6.497 (0.048)	6.862 (0.062)	5.777 (0.090)
France	4.451 (0.217)	5.712 (0.149)	4.475 (0.130)
Greece	3.609 (0.437)	3.592 (0.342)	3.029 (0.405)
Hungary	4.133 (0.237)	4.614 (0.157)	4.182 (0.241)
Ireland	5.595 (0.191)	6.026 (0.068)	6.113 (0.023)
Italy	4.569 (0.911)	4.650 (0.808)	4.122 (0.841)
Luxembourg	5.097 (-)	5.571 (-)	4.635 (-)
Netherlands	5.804 (0.201)	6.294 (0.138)	5.311 (0.228)
Poland	3.864 (0.228)	4.682 (0.157)	3.383 (0.155)
Portugal	4.075 (0.288)	4.926 (0.514)	3.925 (0.391)
Sweden	6.194 (0.135)	6.638 (0.101)	6.036 (0.154)
Slovenia	4.143 (0.277)	4.839 (0.179)	4.499 (0.109)
Slovakia	4.167 (0.140)	4.632 (0.021)	4.010 (0.084)
United Kingdom	5.227 (0.160)	5.645 (0.172)	5.579 (0.176)

Source: ESS 2002, 2004, 2006 and 2008; European Commission 1999 and 2003.
Notes: standard deviation in parentheses. Standard errors in square brackets. *** significant at 1%. Standard deviations for Denmark, Estonia, and Luxembourg are not reported as, for those countries, data are available at NUTS0 (national) level.

Table 3A. Baseline results for Trust and Help

Trust		Treated 1st order	Treated 2nd order	Treated 3rd order
Non treated	**1st order**	-0.454**	-0.447**	-0.491*
		(0.210)	(0.207)	(0.255)
	AIC	186.47	186.65	189.91
	2nd order	-0.623*	-0.562*	-0.619
		(0.348)	(0.313)	(0.380)
	AIC	193.19	191.32	195.05
	3rd order	-0.900	-0.724	-0.800
		(0.611)	(0.501)	(0.594)
	AIC	203.53	197.57	201.98
Help		**1st order**	**2nd order**	**3rd order**
Non treated	**1st order**	-0.215	-0.211	-0.249
		(0.194)	(0.191)	(0.248)
	AIC	177.5	178.8	181.4
	2nd order	-0.391	-0.353	-0.402
		(0.321)	(0.290)	(0.364)
	AIC	181.7	182.1	185.0
	3rd order	-0.414	-0.301	-0.371
		(0.541)	(0.449)	(0.553)
	AIC	184.2	183.0	186.3

Source: Authors' calculations on ESS 2002, 2004, 2006 and 2008 and European Commission data. Notes: instrumental variables estimates. Robust standard errors in parentheses. All regressions include country and number of years under Objective 1 treatment dummies. *** indicates a significance at 1%; ** significant at 5%; * significant at 10%.

Table 3B. Baseline results for Fair and PC1

Fair		Treated 1st order	Treated 2nd order	Treated 3rd order
Non treated	**1st order**	-0.488**	-0.481**	-0.566**
		(0.210)	(0.206)	(0.255)
	AIC	152.5	151.9	157.4
	2nd order	-0.748**	-0.680**	-0.791**
		(0.363)	(0.326)	(0.396)
	AIC	163.7	159.7	166.6
	3rd order	-1.124*	-0.931*	-1.080
		(0.672)	(0.556)	(0.658)
	AIC	180.9	170.8	179.6
PC1		**1st order**	**2nd order**	**3rd order**
Non treated	**1st order**	-0.749**	-0.738**	-0.845*
		(0.371)	(0.365)	(0.455)
	AIC	369.1	369.2	373.0
	2nd order	-1.137*	-1.030*	-1.169*
		(0.622)	(0.559)	(0.685)
	AIC	376.9	374.8	379.4
	3rd order	-1.578	-1.268	-1.457
		(1.099)	(0.905)	(1.084)
	AIC	387.2	380.8	386.4

Source: Authors' calculations on ESS 2002, 2004, 2006 and 2008 and European Commission data. Notes: instrumental variables estimates. Robust standard errors in parentheses. All regressions include country and number of years under Objective 1 treatment dummies. *** indicates a significance at 1%; ** significant at 5%; * significant at 10%. PC1 indicates the first component of a principal component analysis on the three Social Capital indicators. The first component explains 92% of the total variation.

Table 3C. First stage results for best specifications

	Trust	Help	Fair	PC1
First stage coefficient	0.720**	0.720**	0.731***	0.720**
	(0.124)	(0.124)	(0.128)	(0.124)
F-excluded instrument	28.56	28.56	32.23	28.56
No. Obs.	168	168	168	168

Source: Authors' calculations on ESS 2002, 2004, 2006 and 2008 and European Commission data. Notes: first stage results of instrumental variables estimates. Robust standard errors in parentheses. All regressions include country and number of years under Objective 1 treatment dummies. *** indicates a significance at 1%; ** significant at 5%; * significant at 10%. PC1 indicates the first component of a principal component analysis on the three Social Capital indicators. The first component explains 92% of the total variation.

Table 4. Robustness: outliers and fake thresholds

	Excluding outliers	Threshold 75%	Threshold 63%	Threshold 101%
	(1)	(2)	(3)	(4)
Trust	-0.250*	-0.327**	-0.081	-0.070
	(0.146)	(0.137)	(0.243)	(0.097)
Help	-0.110	-0.155	-0.084	-0.025
	(0.149)	(0.133)	(0.233)	(0.106)
Fair	-0.420**	-0.351**	0.019	0.041
	(0.190)	(0.127)	(0.229)	(0.094)
PC1	-0.617*	-0.539**	-0.095	-0.036
	(0.339)	(0.238)	(0.431)	(0.166)
No. Obs.	164	168	168	168

Source: Authors' calculations on ESS 2002, 2004, 2006 and 2008 and European Commission data. Notes: Instrumental variables estimates for column (1); OLS estimates for columns (2)-(4). Robust standard errors in parentheses. All regressions include country and number of years under Objective 1 treatment dummies. *** indicates a significance at 1%; ** significant at 5%; * significant at 10%. PC1 indicates the first component of a principal component analysis on the three Social Capital indicators. The first component explains 92% of the total variation.

Table 5. Robustness: balancing properties for other covariates

	β (best specification for: trust, help and PC1)	β (best specification for: fair)
Accessibility and Geography		
Motorways per capita	6.780	23.700
(X 1,000,000)	(46.000)	(51.300)
Railways per capita	0.542*	0.358
(X 1,000)	(0.303)	(0.244)
Distance from North Pole	237.058	238.371
	(195.529)	(194.342)
Population density	-0.164	-0.178
	(0.423)	(0.420)
Demography		
Net birth rate	0.007	0. 100
(X 1,000)	(1.230)	(1.260)
Net migration rate	-0.004*	-0.004*
	(0.003)	(0.003)
Life expectancy at 18	-0.005	-0.005
	(0.006)	(0.006)
Violent crime rate	0.259	0.236
(X 1,000)	(0.369)	(0.348)
Education and Employment		
Share of total students	0.214	0.221
	(1.020)	(1.017)
Employment rate	-1.833	-1.925
	(1.891)	(1.808)
Governance		
QOG1 (Broad definition)	-0.152	-0.149
	(0.155)	(0.153)
QOG2 (Narrow definition)	-0.136	-0.129
	(0.189)	(0.182)

Source: Authors' calculations on the Regio Eurostat database. Notes: instrumental variables estimates. Robust standard errors in parentheses. All regressions include country and number of years under Objective 1 treatment dummies. *** indicates a significance at 1%; ** significant at 5%; * significant at 10%. Definitions. Motorways per capita: Kilometers of motorways divided by population; Railways per capita: Kilometers of railways divided by population; Distance from the North Pole: Kilometers from the most important city in the Region to the North Pole; Population density: log of the population per square kilometer (2000-04 average); Net migration rate: net migration/ population at January 1st (2000-04 average); Life expectancy at 18: life expectancy in years at 18 years old; Violent crime rate: share of total deaths due to assaults; Share of total students: number of total students (ISCED 0-6) over population aged 6-24; Employment rate: share of employed individuals over population aged 15-64; QOG1: average scores for perceived quality, impartiality, and corruption for education, health, and law enforcement (see Charron et al., 2014); QOG2: average scores for the perceived quality of education, health, and law enforcement (see Charron et al., 2014).

Table 6. Heterogeneous response according to the quality of government

	Trust	Help	Fair	PC1
β	-0.404**	-0.103	-0.503**	-0.655*
	(0.197)	(0.183)	(0.190)	(0.336)
QOG1	0.150	0.211	-0.018	0.221
	(0.117)	(0.177)	(0.110)	(0.200)
QOG1*D_i	0.238**	0.154	0.400***	0.508**
	(0.132)	(0.137)	(0.114)	(0.221)
No. Obs.	164	164	164	164
β	-0.304*	-0.019	-0.295*	-0.407^{+}
	(0.166)	(0.153)	(0.166)	(0.278)
QOG2	0.257**	0.358**	0.154	0.487**
	(0.120)	(0.158)	(0.120)	(0.210)
QOG2*D_i	0.204**	0.022	0.330***	0.396**
	(0.090)	(0.101)	(0.094)	(0.146)
No. Obs.	153	153	153	153

Source: Authors' calculations on ESS 2002, 2004, 2006 and 2008 and European Commission data. Notes: instrumental variables estimates. Robust standard errors in parentheses. All regressions include country and number of years under Objective 1 treatment dummies. All specifications refer to the best specifications according to the AIC (see tables 3A-3B). *** indicates a significance at 1%; ** significant at 5%; * significant at 10%. PC1 indicates the first component of a principal component analysis on the three Social Capital indicators. The first component explains 92% of the total variation.

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Appendix

Derivation of equation (8):

By plugging (7) into (4) and deriving by T, we obtain:

$$\frac{\partial \alpha^*}{\partial T} = \frac{\rho \lambda^{*\rho} T^{\rho-1}}{\left(\lambda^* T\right)^\rho + \frac{1-\lambda^*}{1+\delta}\delta T} - \frac{\left(\lambda^* T\right)^\rho \left[\rho \lambda^{*\rho} T^{\rho-1} + \frac{1-\lambda^*}{1+\delta}\delta\right]}{\left[\left(\lambda^* T\right)^\rho + \frac{1-\lambda^*}{1+\delta}\delta T\right]^2}$$

$$= \frac{\rho \lambda^{*\rho} T^{\rho-1}\left[\left(\lambda^* T\right)^\rho + \frac{1-\lambda^*}{1+\delta}\delta T\right] - \left(\lambda^* T\right)^\rho \left[\rho \lambda^{*\rho} T^{\rho-1} + \frac{1-\lambda^*}{1+\delta}\delta\right]}{\left[\left(\lambda^* T\right)^\rho + \frac{1-\lambda^*}{1+\delta}\delta T\right]^2}$$

$\frac{\partial \alpha^*}{\partial T} < 0$ if and only the numerator is negative.

After manipulations, this implies that:

$$\frac{\partial \alpha^*}{\partial T} < 0 \Leftrightarrow \rho T^\rho - T^\rho < 0 \Leftrightarrow \rho < 1 .$$

Endogenous politicians' preferences:

In the theoretical model in Section 2, politicians' preferences are exogenous. This implies that the local government may be selfish (i.e. $\gamma<1$) even if most of the population is civic (i.e. $\alpha \rightarrow 1$). In this Appendix we extend the basic model by assuming that the politicians' behavior actually mirrors that of the population. In other words, we assume now that $\gamma=\gamma(\alpha)$, with $\frac{\partial \gamma}{\partial \alpha} > 0$. For the sake of simplicity, we assume that $\frac{\partial \gamma}{\partial \alpha}$ is bounded. The local government's concern for the public good provision is positively correlated with the share of civic individuals in the population. This assumption actually reflects the empirical evidence by Fisman and Miguel (2008) on cultural norms and parking behavior by diplomats in New York.

A backward induction solution implies that equation (4) still holds. The first stage maximization problem now becomes:

(5a)
$$\max_{\lambda} W_G = \left[1-\gamma(\alpha^*)\right]\ln\left(\frac{1-\lambda}{1+\delta}T\right)+\gamma(\alpha^*)\ln(\lambda T)^{\rho}$$

Where α^* is a function of λ as shown in equation (4).

By taking the first order condition of equation (5a) we obtain:

(6a)
$$\frac{\partial W_G}{\partial \lambda} = -\frac{\partial \gamma}{\partial \alpha^*}\frac{\partial \alpha^*}{\partial \lambda}\ln\left(\frac{1-\lambda}{1+\delta}T\right)-\frac{1-\gamma(\alpha^*)}{1-\lambda}+\frac{\partial \gamma}{\partial \alpha^*}\frac{\partial \alpha^*}{\partial \lambda}\ln(\lambda T)^{\rho}+\frac{\gamma(\alpha^*)\rho}{\lambda}=0$$

As before, $\lim_{\lambda\to 0}\frac{\partial W_G}{\partial \lambda}=+\infty$, $\lim_{\lambda\to 1}\frac{\partial W_G}{\partial \lambda}=-\infty$ and $\frac{\partial^2 W_G}{\partial \lambda^2}<0$, thus implying that the solution exists and is unique, although it cannot be found in closed form. λ^* now also depends on the size of the transfer. In particular, since $\frac{\partial W_G}{\partial \lambda}$ is monotonically decreasing in λ, $\frac{\partial \lambda^*}{\partial T}>0 \Leftrightarrow \frac{\partial W_G}{\partial \lambda \partial T}>0$:

(7a)
$$\ln(\lambda T)^{\rho}-\ln\left(\frac{1-\lambda}{1+\delta}T\right)>0 \Leftrightarrow \rho>1.$$

Equation (7a) shows that the politicians' concern for the public policy actually depends on fundamentals. The higher the effectiveness of public policies, the larger the share of transfers invested by the local government in the provision of public goods.

This implies that the result stated in equation (8) still holds, thus leaving the main result of the model unchanged.

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