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RESEARCH ARTICLE

Individual trust: does quality of local institutions matter?

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Abstract

This paper contributes to the literature on the determinants of trust by investigating how the quality of local services influences individuals' generalized trust and trust in local governments. Using data from Italian national statistical office (Istat) *Aspects of Daily Life* survey, after building a new measure for the quality of local services, we study its effect on individuals' trust using linear regressions techniques. Our findings suggest that good local public services have a positive impact on individuals' trust, the effect being stronger for trust in local institutions. Our results are robust to potential endogeneity issues, tested using a two-step GMM estimation procedure, and to potential omitted variables bias, according to the method proposed by Altonji *et al.* (2005).

Keywords: Trust; trust in local institutions; quality of public services; linear regression; IV estimation

1. Introduction

In recent years concerns about the declining image of public administration have been raised in most Western countries. As a consequence, governments have engaged in reforms to modernize public services and to improve their quality. The implicit hypothesis at work is that 'better performing public services will lead to increased satisfaction and, in turn, this will lead to more trust in government' (Van de Walle and Bouckaert, 2003); as a side effect, good-working institutions could also reinforce generalized trust by improving citizens' perceptions of the quality of public action.

Why should public institutions care about citizens' trust? A vast empirical literature links trust positively to different aspects of a country's economic performance (employment, financial transactions, growth: see Algan and Cahuc, 2014, for a recent survey) as well as to individual outcomes (such as happiness and economic success: Delhey and Newton, 2003; Growiec and Growiec, 2014). Trust is a key ingredient in all exchanges that involve either imperfect information or a time-related element (see for example Guiso *et al.*, 2008, for financial transactions and Guiso, 2012, for insurance markets) and is crucial every time it is impossible to fully monitor one of the parts involved. The interaction between citizens and public institutions is a good example: both parts suffer from asymmetric information, in terms of characteristics and actions, and are limited in monitoring the behaviour of the counterpart. For the system to work properly, both parts need to believe the other will not indulge in self-serving behaviours that could hurt the common interest. Two different types of trust play a role in such a context: generalized trust, that is trust in those individuals with whom no direct relationship exists but who belong to the same community, and particularized trust, which involves well-identified subjects (citizens and a public institutions, in this case) and is affected by their characteristics and actions (Bjørnskov, 2006).[1]

[1]Different types of trust do not necessarily evolve in the same way over time. Paxton (1999) finds a decline in trust in individuals but no decline in trust in institutions. Twenge *et al.* (2014) report, instead, a constant decline in both types of trust from the mid-1980s onwards.

Although a growing number of studies focuses on the connection between social capital (a broader concept that includes trust) and institutions (see Alesina and Giuliano, 2015 for a recent review), little is known about the relationship between the quality of local public services and both types of trust.[2] Citizens interact on a daily basis with local institutions on a wide variety of issues (health care services, public transportation, childcare facilities and so on) and use these frequent exchanges to update their perceptions about the quality of the institution responsible for the provision of the service used.

The aim of the present paper is to investigate whether these perceptions[3] affect trust in local institutions as well as generalized trust. In a broader perspective, we investigate whether public institutions can promote trust by investing in the quality of their services, and in particular those that are more frequently used by citizens.

We focus our attention on Italy and our analysis is conducted controlling for a wide array of individual and environmental characteristics that, according to the existing empirical literature, could affect individual trust. We construct a composite indicator of the perceived quality of local institutions, based on individual answers to questions about the availability of local public services, waiting time to get access to those services and structural characteristics of the area in which people live. The indicator is built at the level of the local labour market areas (LMAs, *Sistemi locali del lavoro*), sub-regional geographical areas[4] built for statistical purposes on the basis of residents' regular commuting patterns.

In comparison with cross-national studies, our within-country approach reduces measurement error issues related to parameter heterogeneity (Eicher and Leukert, 2009) and interpretation issues linked to how respondents belonging to different countries answer questions about trust (see e.g. Holm and Danielson, 2005) or formal institutions (Alesina and Giuliano, 2011). Moreover, choosing Italy ensures a high degree of local variability in terms of both social capital (as testified by the empirical literature started by Putnam in 1993) and public services quality (Bripi *et al.*, 2011).

Our paper adds to the existing literature by using a quality index based on local public services commonly used by citizens. We believe that this index better captures the direct relation between citizens and public institutions compared to more indirect measures (such as crime rate, the perception of inequality and the enforcement of law) used in other studies. Our measure has several pros: there is no confusion about which institutions is in charge of service provision, the level of government responsible for the service is among the nearest to citizens and contacts happen with high frequency (improving the accuracy of individual perceptions). It is also less exposed to the bias related to general opinions on public administration (see Van de Walle and Bouckaert, 2003, for a discussion on the topic).

We also contribute to the literature on the quality of local government by building a new indicator at a very disaggregated, but meaningful, local level. So far, comparative research has focused mainly on national differences. More recently, to account for within-country variation, scholars developed subnational indicators (regional or provincial) related to corruption and crime (e.g. for Italy: Del Monte and Papagni, 2007; Golden and Picci, 2005) or public sector efficiency (for Italy, Barone and Mocetti, 2011; Giacomelli and Tonello, 2015; Tommasino and Giordano, 2013). Charron *et al.* (2014) created a more comprehensive measure of government quality for the EU regions. Our paper provides a finer disaggregation by constructing an indicator of public services quality at the local LMA level. This level of aggregation represents areas that encompass the individuals' daily life and the local services commonly used for both working and private reasons.

[2]With the exception of the correlation between trust in medical institutions and the perceived quality of those institutions (see for example Cook *et al.*, 2004 or Hupcey and Miller, 2006).

[3]Given that individual opinions might as well be influenced by social capital, we compare our subjective measure with other objective measures developed in the literature and we do not find significant differences in terms of local institutions ranking (see Table a1 in the online appendix).

[4]LMAs are not administrative entities and are not designed to respect administrative boundaries. They are constructed using a functional criterion (the proportion of commuters who cross the LMA boundaries on their way to work) to have comparable sub-regional labour market areas for the reporting and analysis of statistics.

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Our main results show that good local public services have a positive effect on both generalized and institutional trust: while the impact on the first is rather small, that on the second is sizeable.

This suggests that the quality of public intervention might not be very relevant for generalized trust, at least in the short run, lending support to the notion of its rather stable nature over time (Bjørnskov, 2006). Trust in institutions, instead, seems to be more responsive to current opinions, supporting the idea that public policies aimed at improving service quality have also positive spillovers on the trusting relationship between institutions and citizens. Our results also suggest that citizens revise their opinions on institutional quality over time.

Our paper is similar to the work done by Rothstein and Stolle (2008), who argue that individual trust is partly determined by the perceived fairness of those who are in charge of the public interest. Using micro-data for Canada, they study the relationship between individual generalized trust and political institutions (courts and police departments), finding a positive correlation. Compared with their analysis, our institutional indicator is based on services widely used by all citizens, instead of institutions that many citizens might barely get in touch with. Moreover we look not only on generalized trust but also on trust in institutions and we test the robustness of our results to possible endogeneity issues.

Our paper is also close to Christensen and Laegreid (2005), who study the relation between trust in different public institutions in Norway. They show that citizens' satisfaction with a specific service tends to have a positive effect in trust on all institutions. Compared to their work, our analysis is based on a much larger sample, improving the precision of our estimates, and on a larger set of widely used local services, clearly under the responsibility of the local governments. Our findings go in the same direction as their results.

The paper is structured as follows: section 2 presents the relationship between trust and public services and the existing literature on the topic, section 3 briefly describes the Italian institutional set-up, section 4 outlines the empirical strategy and the data used, section 5 presents the estimation results and section 6 concludes.

2. Trust and public services

Trust, both generalized and particularized, refers to individuals' expectations about actions performed by others and about the consequences of those actions. According to a widely accepted definition, trust can be seen as the positive expectation that no harm will come from another member of the community (individual or organization) even if he can be neither monitored nor controlled (Mayer *et al.*, 1995). This expectation can be modified by family or personal experiences and by individuals' interactions with the society. For example, Guiso *et al.* (2008) build an overlapping-generation model in which individual beliefs about trusting others are absorbed from parents and, after a slow and constant update through life experience, transmitted to children. These intergenerationally transmitted beliefs affect individuals' decisions on whether or not to trust other members of the society and to participate in any type of anonymous exchange. As a result, multiple equilibria are possible and a society can remain trapped in a bad equilibrium where individuals mistrust others, do not engage in the market and are therefore unable to update their beliefs about others' behaviours. Greif (1994) studies the effects of rational cultural beliefs, which should capture individuals' expectations on the long-run persistence of institutions. Past beliefs affect decisions in periods that follow and become the focal point for individuals' expectations.

In our work we consider two types of trust. Generalized trust is directed toward those individuals belonging to the same community on whom, however, the trusting part has no direct information. The determinants of generalized trust have been the focus of a growing number of empirical studies. Individual characteristics seem to matter as well as family characteristics and values (Albanese *et al.*, 2016; Dohmen *et al.*, 2011). Also several aspects of the society in which individuals live play a role: socio-economic factors, such as income inequality and ethnic heterogeneity (e.g. Alesina and La Ferrara, 2002; Glaeser *et al.*, 2000; Knack and Keefer, 1997; Knack and Zak, 2002; Uslaner,

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2002, 2003; Zak and Knack, 2001), security and crime rates (e.g. Delhey and Newton, 2003; Moschion and Tabasso, 2014; Uslaner, 2002), policies and institutional conditions (Accetturo *et al.*, 2014; Knack and Keefer, 1997; Tabellini, 2010).

Recently the literature documents a decline over time of generalized trust and studies whether this pattern is the result of an ageing effect, a period effect or a generational effect (Robinson and Jackson, 2001). The cohorts' explanation postulates that differences in trust attitudes among individuals are due to the prevailing cultural and political climate in which each generation grew up. An age explanation, instead, argues that trust changes according to the position of each individual in their life cycle. Finally, a particular moment in history may also affect trust across ages and generations (post-communist societies after the fall of communist regimes are an example). A variety of empirical studies find, mainly using laboratory experiments, evidence of an age-related pattern of generalized trust that accumulates up to a certain age and either decumulates over time (Bellamare and Kroger, 2007; Fehr *et al.*, 2003) or remains constant (Sutter and Kocher, 2006). Clark and Eisenstein (2013) in their work isolate the three types of effects, confirming Robinson and Jackson's (2001) findings.

Trust in institutions, instead, is a type of particularized trust regarding the relationship between citizens on one side and one or more public institutions on the other. Two theoretical explanations of the origins of institutional trust are debated in the literature (see Mishler and Rose, 2001, for a summary). According to cultural theories, institutional trust is a mere projection of interpersonal trust, pictured as a long-lasting concept that can be considered as exogenous in the short run. This idea has been challenged by several authors: Newton (1999) demonstrates that the two types of trust are conceptually different, while Brehm and Rahn (1997) and Muller and Seligson (1994) show that interpersonal trust is more affected by trust in institutions than the reverse. Institutional theories, instead, see trust in institutions as a rational response to their performance and, therefore, endogenous with respect to the political environment (for example Mishler and Rose, 1997, 2001). Which performance has to be considered and how it has to be evaluated is an open question. Christensen and Laegreid (2005) and Van de Walle and Bouckaert (2003), for example, look at individual satisfaction with public services, grounding their choice on the increasing role of citizens as consumers.

The empirical literature on the determinants of trust in institutions is smaller with respect to the one on generalized trust. Hudson (2006) provides evidence that individual characteristics, such as education, employment and marital status, matter as well as the degree of contact each individual has with the institution. Individual characteristics are also an important factor in Christensen and Laegreid (2005), who point out that trust in government is of a general character and tends to spread across different institutions. Twenge *et al.* (2014) and Hudson (2006) are the only ones, to our knowledge, that look at the age–cohort–period analysis for trust in institutions. The latter shows that trust in institutions has the same non-linear age pattern found for generalized trust, while the former finds that period bears the main responsibility for decline in trust, while the generational effect is weak.

The channels through which local public services and trust can affect each other are, in our view, mainly two.

On the one hand, if trust is shaped by individual expectations about others' behaviour, the surrounding environment can affect trust by influencing the expected probability of encountering bad conduct. Littered streets, broken benches, graffiti and so on reinforce individuals' knowledge about others' misbehaviour, and therefore might induce mistrust. They also reduce individuals' propensity to trust those public institutions that are unable to preserve the public good. Citizens' perception of the quality of public intervention also matters. Long queues, run-down public offices and listless civil servants might reinforce individuals' negative expectations of others' behaviour and of the quality of public institutions. However, trust can have also a direct effect on individual perceptions: good services may be perceived as an exceptional event, and therefore may not change expectations if citizens are used to living in a deteriorated environment. Generally speaking, a good reputation, high opportunity costs of free-riding and information diffusion are all aspects that can reduce uncertainty about others' behaviour, and therefore help to build trust and reciprocity.

On the other hand, trust and public institutions are interconnected because they share a selection problem. In areas where public services are poor and the environment is deteriorated it is more likely that people who care about public goods will move away. This, in turn, increases the probability of listless civil servants and bad behaviour, lowering even more the quality of the public environment and creating a vicious circle between trust and the quality of services.

3. Italian institutional set-up

The Italian institutional framework is characterized by three levels of sub-national government: regions, provinces and municipalities. Regions are involved primarily in the provision of health services. Provinces perform some functions in the areas of road- and school-building maintenance and the natural environment. Municipalities are responsible for several local public services (such as public illumination, waste disposal, urban road maintenance, local transport) and for social services at large. In particular, they provide assistance to poor people, retirement homes and childcare facilities (up to the age of six). They also provide school-related services such as refectories and school buses. Education in the stricter sense (and therefore teachers' pay-rolls) is instead the responsibility of central government, which is also in charge of providing the bulk of social spending, mainly through pensions and unemployment benefits.

For some services (like health care and childcare) the central government provides the general rules to be followed; the application of those rules, which is responsibility of local governments, might generate very different results in terms of both accessibility and quality. For other services, like local public transportation or waste disposal, local governments are mainly autonomous in shaping the service and its costs.

4. Empirical strategy and data

The empirical equation we estimate is the following:

$$trust_{ij} = \alpha + \beta qual_j + \delta X_{ij} + \gamma P_j + \varepsilon_{ij} \quad (1)$$

where $trust_{ij}$ is a trust measure for an individual i living in the labour market area (LMA) j, $qual_j$ is an indicator of the quality of public services in the LMA j, X_{ij} are individual controls, P_j are local controls and ε_{ij} is an i.i.d. error term.

As a first step, we perform an OLS regression on a sample of individuals aged 25 to 85, adjusting our standard errors to take into account within-family correlation (Moulton, 1990). We add a full set of provincial dummies to take into account the well-known Italian north–south difference. Our analysis could suffer from reverse causality and omitted variable issues: it is possible that individuals surrounded by better institutions develop greater trust, but it is also possible that institutions work better in those areas where trust is higher.

As a second step, to deal with the potential endogeneity of our quality measure, we rely on an instrumental variable approach using a two-step GMM estimator. We address, instead, the problem of potentially omitted variables using the insight from Altonji *et al.* (2005).

Finally, we test whether the effect of public service quality on individuals' trust changes according to age, performing separate estimations on three age groups: 25–34, 35–55 and 56–85.[5]

Data and variables

Our dataset is built by pooling the 2012–2013 waves of the Istat's survey *Aspects of Daily Life* (*Aspetti della vita quotidiana*). The survey has been conducted yearly since 1993 on a representative sample of

[5]Our data do not allow us to disentangle age from cohort or period effects.

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the Italian population. The questionnaire seeks information on demographics, self-reported economic characteristics and health, and features specific questions about different local services, social participation and attitudes. Starting in 2012, specific questions on trust in institutions as well as generalized trust were included. Our final sample contains over 67,000 observations. In the following we briefly describe the main variables used in the analysis (Table a2 in the online appendix[6] provides descriptive statistics).

Trust

We consider as the dependent variable two different measures of trust. The first one is based on the question: 'Do you generally think that people can be trusted?' The possible answers are 1 if the respondent thinks that most people can be trusted and zero otherwise. This question is very similar to that widely used in the World Value Survey (WVS) and the US General Social Survey (GSS), 'Generally speaking, would you say that most people can be trusted or that you have to be very careful in dealing with people?', and represents a measure of generalized trust.[7]

Our second measure of trust is based on the following question: 'How much do you trust the following institutions: 1) regional government; 2) provincial government; 3) municipal government?'. Answers range from 1, 'Not at all', to 10, 'Completely'. For each individual we average the answers to these three questions to get a proxy of trust in local government. We consider the three questions together because the responsibility of the services we include in our quality indicator is shared between these three levels of government. Moreover, the answers to the three questions are highly correlated,[8] suggesting that opinions on the reliability of local governments are based on a common base. Figure 1 shows the distribution of the generalized trust measure across LMAs while Figure 2 shows the distribution of trust in local government: higher levels of trust are concentrated in the northern part of the country and partially in the centre, but there is substantial geographical variability across the national territory.

Quality of local institutions

Since the mid-1990s there has been a proliferation of international data on the quality of government. Today these measures mainly consist of national-level indexes capturing the degree of corruption and the rule of law. The focus on national indicators, however, provides a distorted picture due to the presence of significant sub-national variation, which stems from the decentralization of the provision of many public services, and to the differential enforcement of rules at the local level. Recently, to account for this within-country heterogeneity, scholars focused on the construction of more narrowly defined measures. For Italy Golden and Picci (2005) and Del Monte and Papagni (2007) provide provincial measures of corruption while Giordano and Tommasino (2013) and Giacomelli and Tonello (2015) develop two measures of public sector efficiency. There is still, however, a shortage of measures of local government quality. A first attempt to fill this gap was made by Charron *et al.* (2014), who built an indicator of the quality of government for 172 European NUTS 2 regions based on individuals' perceptions of three regionally provided public services: education, healthcare and law

[6]See https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxhbm5hbGF1cmFtYW5jaW5pcmVzZWFyY2h8Z3g6NzljNTdlZjA3ZTBjZjFmNw (accessed 3 August 2018).

[7]Some studies (Fehr, 2009; Glaeser *et al.*, 2000) pointed out that trust measures based on these standard questions might not capture only trust but also a mix of trust, trustworthiness and features of individuals' preferences such as risk aversion. Recently the literature casts doubts on the validity of the criticisms raised of this question (for example Delhey *et al.*, 2011; Uslaner, 2015). We use this measure to obtain results that are highly comparable with those found in the rest of the literature.

[8]The answers on regional and provincial levels show a correlation index higher than 0.85, while the correlation with municipal government is higher than 0.65 for both variables. The Cronbach's alpha, a measure of internal consistency that shows how closely related a set of items are if considered as a group, is greater than 0.85, supporting our choice to use an average of the three variables.

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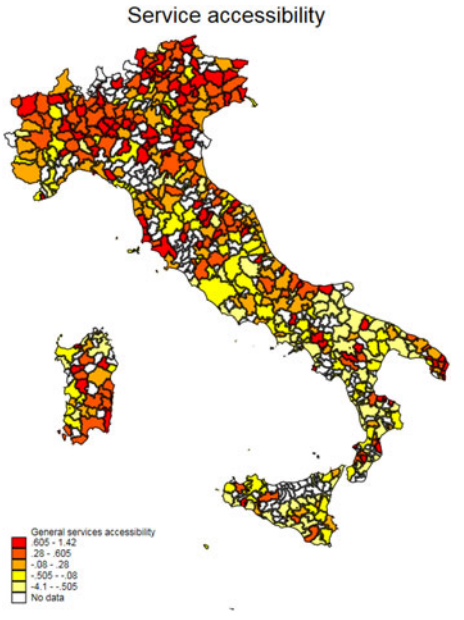

Figure 1. Generalized trust

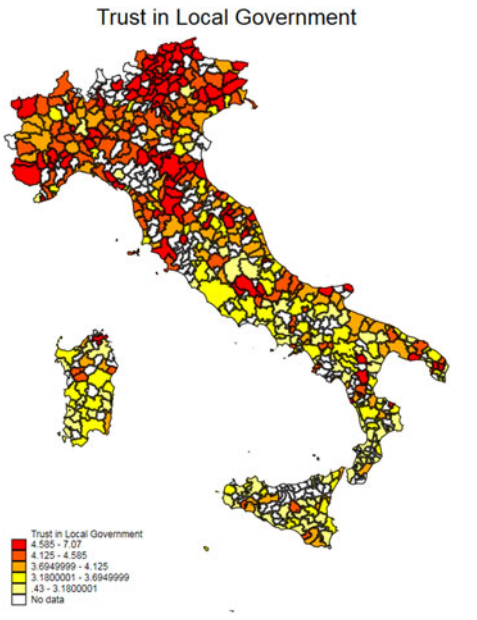

Figure 2. Trust in local government

enforcement. Their analysis shows great variability in the quality of government: regions in the north of Italy enjoy levels as high as some regions in Germany or Austria, while those in the south are closer to the low-performing regions in the new member states.

In the literature, the quality of government has been typically proxied by indicators capturing either the impartiality of policy implementation (e.g. limiting corruption, prevalence of the rule of law) or its effectiveness (e.g. protection of property rights). We claim that the quality of local government translates into the quality of local public services and that citizens use this aspect (more than dysfunctional behaviours, such as corruption, which they might experience only occasionally or indirectly) to shape their trust in the institution ultimately in charge of the service provision.

Based on this idea, we develop a new measure of the quality of local institutions. The indicator is constructed at the LMA level[9] and coded in a way that higher values correspond to higher quality.

We consider three sets of questions:

- *Individuals' perceptions of the structural characteristics of the living area*:[10] respondents were asked whether their living area has poor street lighting, a lack of public transportation linking the neighbourhood to other parts of the city, littered streets and poorly maintained pavements. Answers to these questions range from 1, 'A lot', to 4, 'Not at all'.
- *Individuals' opinions about the availability of some of the most frequently used local public services*: pharmacies;[11] emergency rooms; local government offices; post offices[12] and police stations. We recoded the answers so that the scale ranges from 1, 'Very difficult to access', to 3, 'Not difficult to access'.

[9]The indicator is constructed by pooling two waves of the survey (2012 and 2013) to increase sample size at the LMA level and to smooth answer fluctuations. We repeat our analysis using a quality indicator constructed by pooling four waves of the survey (2010–2013). The results are unchanged.

[10]The whole town or just the neighbourhood, depending on the size of the municipality.

[11]Pharmacies are not necessarily state-owned but are highly publicly regulated in terms of licences and opening hours.

[12]Post offices are no longer state-owned, but they are still perceived as a typical public service.

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- *How much time respondents waited to be served:* in local government offices; public medical centres (known in Italy as ASL); post offices for postal services and post offices for financial services. We recoded each answer into a dummy that takes the value of 1 if the waiting time is less than 30 minutes and the value of zero otherwise.[13]

The indicator of the quality of local services is constructed following the guidelines provided in the OECD's *Handbook on Constructing Composite Indicators* (2008). We started by standardizing the answers to the questions used to construct the indicator, then we performed a principal component analysis on individual data and, finally, we computed the indicator as the LMA mean of the first four components.[14] We choose the first four components because together they explain more than 60% of the total variance and each reports an eigenvalue greater than 1.[15]

Figure 3 shows both the geographical breakdown of our indicator and its quintile distribution within each region.[16] The quality of local services is lower in the south and higher in the north, but the within-area variability is high. For instance, in the south, Puglia displays a high regional variation ranging from areas within the Bari province, where the quality is very low, to areas in the province of Lecce where it is very high. Heterogeneity is present also in the north, as shown by the high variance of quality within Lombardy or Piedmont.

Controls

In our empirical analysis we include two sets of controls, one at the individual and one at the geographical level, and we expect them to be correlated to individual trust.

First, we control for individual characteristics that previous studies found to be linked to individual trust, such as gender, age, the number of children, the level of education (a dummy for the high school diploma and a dummy for the BA or higher degree) and two dummies for the employment status of the respondent (employed and unemployed, the reference category being out of the labour force). Furthermore, we include a dummy equal to 1 if the individual is employed in what we define the social sector (healthcare, social services or education, i.e. all jobs that require strong motivation to care for and constantly interact with other individuals), which we think could be positively correlated to individual trust.

Individuals' past experience and misfortunes also matter in determining individuals' trust (see for example Alesina and La Ferrara, 2002). For this reason we include a dummy for the separated/divorced status and a dummy for a perceived poor health condition,[17] which could negatively impact the trust endowment.

Family economic condition is important too, hence we control for a variable that provides a qualitative evaluation of the suitability of the family income to cover household expenditures:[18] a better economic condition should be positively related to trust.

To ensure that our quality indicators do not simply capture the effect of the overall local economic situation (places with fewer resources and more social problems are also likely to offer fewer and less efficient services but also to have less trustful citizens), we include a set of characteristics at the LMA level. We control for two geographical characteristics (the percentages of

[13]Conditional on having used the service.

[14]As a robustness check, we constructed two alternative versions. The first one sums the individual responses and then aggregates them at the LMA level. The second one computes first the mean of each question at the LMA level and then performs the principal component analysis, taking the first principal component as the final indicator. Both alternative versions leave qualitative results unchanged.

[15]We applied the Kaiser criterion, which suggests dropping all factors with eigenvalues below 1.

[16]Each region includes more than one LMA.

[17]This dummy is equal to 1 if respondents report their perceived health status as 'bad' or 'really bad'.

[18]The question asks whether, considering the needs of all family members, family economic resources in the past 12 months were: excellent, good, sufficient or absolutely insufficient.

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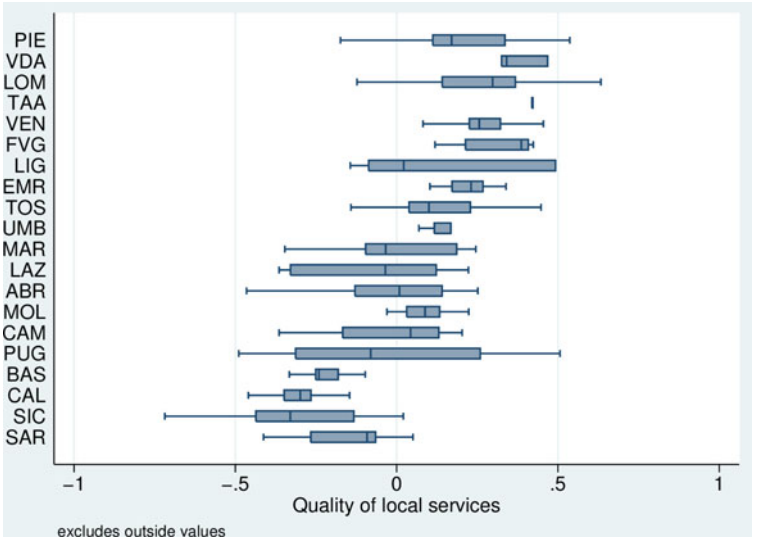

Figure 3. Quality of local services indicator – within-region variation

mountainous and seismic surfaces) and three social variables (unemployment rate, rate of tertiary educated individuals and log of the total population). We expect to find a positive effect in the case of the tertiary education and a negative effect in the case of unemployment and population (previous research shows that trust is lower in a larger community). We also expect a positive effect for the two geographical characteristics, because they should identify areas where the sense of community is higher (for example mountains, are characterized generally by small and cohesive communities).

We also include a dummy for living in the provincial capital (*capoluogo di provincia*) to account for differences linked to living in a large, crowded city compared to a small town. Finally, to additionally control for the well-known structural and economic differences between the different areas of the Italian peninsula, we add to all our regressions a full set of provincial dummies.

5. Results

Baseline results

As a first step, we perform two sets of OLS regressions of the quality of local public services on generalized trust (Table 1) and on trust in local government (Table 2). To test the sensitivity of our coefficients of interest to the inclusion of additional controls, columns 1 to 4 of each table[19] report the results obtained by adding to each regression a new set of variables. Starting from the raw correlation (column 1), column 2 includes individual objective controls, column 3 includes individual variables influenced by individual behaviours and column 4 includes local controls. All columns include the full set of provincial dummies and standard errors clustered at the family level. Our main coefficients are stable across the different specifications.

Looking at generalized trust, the coefficient of the quality of local services index is positive and statistically significant, although small in magnitude. An increase by one standard deviation of the quality indicator increases generalized trust by 0.014 (or 3.9% of the standard deviation of the trust variable).

[19]The number of observations decreases between column 2 and 3 because some of the individual controls are not available for all individuals included in the initial sample. Differences are tiny compared to the overall sample size (350 observations over 66,589 for generalized trust, and 340 observations over 65,595 for trust in local government) and do not affect the results.

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Table 1. Regression results on generalized trust

	(1) b/se	(2) b/se	(3) b/se	(4) b/se
Quality of local services	0.034** [0.016]	0.034** [0.016]	0.042*** [0.016]	0.043*** [0.016]
Employed			0.014*** [0.005]	0.014*** [0.005]
Unemployed			−0.003 [0.006]	−0.004 [0.006]
Age		0.006*** [0.001]	0.006*** [0.001]	0.006*** [0.001]
Age squared		−0.000*** [0.000]	−0.000*** [0.000]	−0.000*** [0.000]
Sickness		−0.071*** [0.004]	−0.048*** [0.004]	−0.048*** [0.004]
Female		−0.019*** [0.003]	−0.019*** [0.003]	−0.020*** [0.003]
Divorced			0.001 [0.006]	0.001 [0.006]
BA			0.139*** [0.006]	0.138*** [0.006]
High school diploma			0.070*** [0.004]	0.070*** [0.004]
Child			0.003 [0.002]	0.003 [0.002]
Job in a social sector			0.033*** [0.006]	0.032*** [0.006]
Sufficient family income			−0.044*** [0.003]	−0.044*** [0.003]
Provincial dummies	Yes	Yes	Yes	Yes
Local controls	No	No	No	Yes
R^2	0.020	0.029	0.053	0.053
Obs.	66,589	66,589	66,239	66,239

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the family level.

To put this figure into perspective, being employed in the social sector increases generalized trust by 0.032, twice the effect of the quality indicator, while having a BA increases it by 0.138, ten times more than the quality of local services.

Individual controls all have the expected signs. Consistently with the findings of other papers (e.g. Alesina and La Ferrara, 2002; Buchan *et al.*, 2008; Putnam, 2000), generalized trust depends positively on age (although at a decreasing rate), education, employment and working in the social sector. Being a woman, however, decreases generalized trust. This result is in line with the existing literature that shows that women trust less than men. A difficult economic situation has a negative impact on the individual propensity to trust others. Looking at previous experiences and personal misfortune, sickness decreases trust, while the coefficient for the divorced state is not statistically different from zero. Among the local area controls, only living in a seismic area is highly statistically significant with a positive sign.

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Table 2. Regression results on trust in local government

	(1) b/se	(2) b/se	(3) b/se	(4) b/se
Quality of local services	0.455*** [0.099]	0.455*** [0.099]	0.406*** [0.098]	0.373*** [0.101]
Employed			−0.162*** [0.027]	−0.160*** [0.027]
Unemployed			−0.148*** [0.039]	−0.146*** [0.039]
Age		0.013*** [0.000]	0.012*** [0.000]	−0.012*** [0.004]
Age squared		0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]
Sickness		−0.498*** [0.027]	−0.404*** [0.027]	−0.404*** [0.027]
Female		0.038*** [0.014]	0.009 [0.015]	0.009 [0.015]
Divorced			0.028 [0.035]	0.030 [0.035]
BA			−0.004 [0.033]	0.002 [0.033]
High school diploma			−0.025 [0.025]	−0.023 [0.025]
Child			−0.003 [0.014]	−0.003 [0.014]
Job in a social sector			0.096** [0.031]	0.095** [0.031]
Sufficient family income			−0.417*** [0.020]	−0.417*** [0.020]
Provincial dummies	Yes	Yes	Yes	Yes
Local controls	No	No	No	Yes
R^2	0.064	0.075	0.087	0.088
Obs.	65,595	65,595	65,255	65,255

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the family level.

When looking at trust in local government, our quality index is positive, highly statistically significant and of sizeable magnitude. An increase by one standard deviation of the quality indicator increases trust by 1.09 (or 45.7% of the standard deviation of trust in local government). To give an idea of the order of magnitude, being employed in the social sector increases trust in local government by 0.095 while having a BA degree has no significant effect. The only comparable coefficients are those associated with negative circumstances (sickness and a difficult economic situation), which can also indicate a higher degree of interaction with public institutions. Trust in local government depends positively on working in the social sector and negatively on age (at a decreasing rate). Unlike Christensen and Laegreid (2005), we do not find any significant effect of gender. Looking at the area controls, unlike the generalized trust case, living in the provincial capital is now relevant, with a negative impact.

This could possibly be related to a size effect: provincial cities are bigger and more congested compared to the rest of the province. Both geographical controls, i.e. living in a seismic area or living in a

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mountainous area, are statistically different from zero: the former has a positive sign (as in the case of generalized trust) while the latter has a negative sign.

Finally, in both cases the R^2 associated to our regressions are quite low, meaning that a large part of variance is unexplained by our sets of controls.

Results by age group

During the life cycle, individuals increase their knowledge about institutions' quality by increasing the number and the frequency of contacts, using a wider array of services, collecting more information about government actions and policies. Moreover, at different stages of the life cycle citizens might care differently about public services or be less willing to change an opinion that is based on a long stream of past experiences. To test possible age-related differences, we repeat our estimation exercise on three separate sub-samples: young, middle-aged and older people (Table 3). Our indicators show the expected signs in all age groups, although the magnitude and significance are different across sub-samples.

When considering generalized trust, the quality of local services indicator is statistically significant, but only at the 10% level, for middle-aged adults and older people but not for younger people. The effect is small and it is not statistically different between the two groups.

Results for trust in local authorities are more interesting. The quality of the local services indicator is positive, sizeable and statistically significant for young adults and older individuals, but not for middle-aged adults. The effect is stronger for the young age group. These results are coherent with empirical findings on age-related pattern of trust, for which it is more likely to change at the beginning and at the end of an individual's life. For the younger group, the effect of local services on trust in government could be related to the formation and reinforcement, in the early stage of life, of individual beliefs about local government performance.

The higher sensitivity of older people is, instead, consistent with research by gerontologists that underlines the importance of neighbours and accessibility to neighbourhood services for this age category, as the network on which they rely progressively shrinks and their informal care needs increase. Moreover, their higher sensitivity could be linked to longer exposure to better/worse services.

Identification issues

Two-step efficient GMM estimation

Our estimates could suffer from endogeneity issues. Public services might work better in trustful contests (for example for those benefits for which information given by the citizen is crucial to get access) generating a reverse flow from social capital to public services. More trustful societies are able to select better civil servants (because they are chosen among individuals with higher civil virtues) and to offer them a better working environment, both in terms of rules to follow and users to serve. Moreover, perceptions might be influenced by the level of social capital in the area: do citizens have a negative opinion because the service was bad or because they *a priori* mistrust the administration that provides it? Endogeneity is certainly an issue if we look at both quality and trust at the aggregate level. However, given that we consider individual trust while our quality measure is aggregated, we do not expect endogeneity to be a major issue in our analysis.

To solve potential endogeneity problems, we rely on an instrumental variable approach based on a two-step efficient GMM estimator.[20] We use two variables at the LMA level, taken from the Istat Census of 1971,[21] as instruments: the population density and the percentage of public workers over the total numbers of workers. They correlate to the current level of public services by proxying the historical level of resources dedicated to the production of public services (public workers), but

[20]Results are unchanged when using a 2SLS estimator (see Table a3 in the online appendix).

[21]Census data are not available for Italian municipalities prior to 1971.

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Table 3. Quality and trust by age group

	(1) Young b/se	(2) Middle age b/se	(3) Elderly b/se
	Generalised trust		
Quality of local services	0.046 [0.038]	0.046* [0.025]	0.038* [0.023]
R^2	0.048	0.063	0.053
Obs.	9,991	27,749	28,499
	Trust in local government		
Quality of local services	0.604*** [0.229]	0.243 [0.144]	0.421*** [0.137]
R^2	0.071	0.081	0.103
Obs.	9,880	27,377	27,998
Individual controls	Yes	Yes	Yes
Provincial dummies	Yes	Yes	Yes
Local controls	Yes	Yes	Yes

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the family level.
All quality indicators coefficients have been estimated separately.

also the potential demand for public services (population density). Our belief is that those areas that were historically oriented toward the provision of public services maintained this peculiarity over time. On the other hand, our instruments should not be so recent as to influence directly today's endowment of individual trust.

Results from the first step of the estimation procedure (Table a4 in the online appendix) show that our instruments are strongly correlated to our quality indicator (negatively for the population density and positively for the percentage of public workers, as expected); furthermore the R^2 of the regression is quite high, reinforcing the quality of our instruments. The weak instruments test confirms the good fit of our instruments. The Hansen's J-test does support the hypothesis that our model is correctly specified.

Table 4 reports the coefficients on the quality of local services indicator from the two-step efficient GMM estimation. The coefficient is not statistically different from zero in both regressions, while the others remain practically unchanged. We perform an endogeneity test of our quality indicator in both regressions: the results of the difference in Sargan's statistic suggest that our main indicator can be treated as exogenous in both cases, in line with our expectations. OLS estimates should, therefore, be considered given that they are more efficient.

Omitted variable bias

Despite our efforts to control for a comprehensive set of both individual and local controls, our results could still be biased by unobserved factors that drive individuals' trust as well as the quality of public services.

To test the robustness of our findings, we use the insight from Altonji *et al.* (2005), which infers the relative importance of the omitted variable bias by investigating how the coefficient of interest changes with the progressive inclusion of additional controls (Bellows and Miguel, 2009). The basic idea is that if by including available additional controls the main coefficient changes substantially, it is likely that unobservables (the omitted variables) would change our estimated effect even more. If, instead, the

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Table 4. Two-step efficient GMM results

	(1) b/se Generalized trust	(2) b/se Trust in local government
Quality of local services	0.132 [0.106]	−0.291 [0.657]
Individual controls	YES	YES
Provincial dummies	YES	YES
Local controls	YES	YES
Endogeneity test: GMM C statistic	0.723	1.048
GMM C *p*-value	[0.392]	[0.306]
Weak instruments test: *F*-test	174.838	169.902
F-test *p*-value	[0.000]	[0.000]
Over-identification test: Hansen's J-test statistic	1.695	0.556
Hansen's J-test *p*-value	[0.193]	[0.456]
Obs.	66,239	65,255

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the family level.

magnitude of our coefficient of interest is relatively untouched by the progressive inclusion of the available additional variables, we can be more confident about the irrelevance of the unobservable factors. The Bellows–Miguel index (BM index) calculates how much greater the effect of unobservables should be, with respect to observable factors, to completely counterbalance the estimated effect of the variable of interest (see Nunn and Wantchekon, 2011, for an explanation of the method). It is a ratio between the coefficients of two separate estimations: a regression with the full set of available control variables (all those used in the main analysis), β_{full}, and a regression with a limited set of controls, β_{rest}. The BM is $\beta_{full}/(\beta_{rest} - \beta_{full})$: a large ratio means that the estimated effect cannot be plausibly explained away completely by attributing it to unobservable characteristics.

We consider two possible sets of restricted covariates: a first set in which we include only provincial dummies and a second set in which we control for both provincial dummies and three individual factors (age, age squared and gender). Our results do not seem to suffer from a serious omitted variable problem. In fact, the BM ratios (Table 5) are always greater than 4, meaning that the impact of unobserved variables would have to be at least four times greater than the estimated public quality coefficient to swipe away the entire estimated effect.

6. Discussion and conclusions

It is certainly true that efficient public services *per se* have a positive impact on the economic activity and the well-being of a society, but do they also have an indirect effect by influencing individual trust?

In the relationship between citizens and public institutions, trust is a key ingredient that allows the system to work properly. Both parts need to 'believe' that the other will be honest and will play by the rules in order to reciprocate and comply with the rules too. Citizens might be reluctant to pay directly or indirectly (through taxes) for services provided by institutions perceived as corrupt, inefficient or slovenly. On the other hand, public institutions might have no incentive to improve service quality if they believe users will tend to get the benefits but to avoid the costs.

This paper contributes to the literature on the link between public institutions and trust by analysing how the perceived quality of local services influences two types of individual trust: generalized trust

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Table 5. Omitted variable robustness check

	Individual controls in the restricted set	Controls in the full set	Generalized trust	Trust in local government
Quality of local services	None	Full set	−4.774	4.560
	Age, age squared, gender	Full set	−5.127	5.079

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The regression includes a full set of provincial dummies. Standard errors are clustered at the family level.

and trust in local institutions. After controlling for individual and local characteristics that the previous literature found to be determinants of trust, our results suggest that there is a positive relation between local service quality and both generalized trust and trust in local administrations. The positive effect is rather small for the former, while it is sizeable for the latter.

The small effect we find on generalized trust supports the idea that this type of trust is stable over time, transmitted from one generation to the next during childhood; as a consequence, improvements in the quality of public services should be perceived as permanent by the individual in order to be able to generate a significant effect.

The sizeable effect on institutional trust, instead, suggests that this type of particularized trust is responsive to current characteristics of the parties involved in the relationship and of the environment in which it takes place. Our results seem to support institutional theories for which trust in institutions is a rational response to their performance and, therefore, endogenous with respect to the surrounding environment.

From a policy perspective, our analysis suggests that any investment in the quality of public services, both in terms of infrastructural quality and of accessibility, produces a positive spillover on institutional trust, and on generalized trust too, that amplifies the positive direct effect. Our results also suggest that this indirect effect is stronger at the beginning and at the end of the life cycle. For the younger group this could be related to the fact that childhood and adolescence are the periods in which individuals form their beliefs about trust. For the older group, rather, this effect is likely to be generated by the increased use of some categories of public services.

Further research is needed to better understand the determinants of institutional trust in light of its higher responsiveness to contemporaneous actions. For example is institutional trust more related to direct or indirect experiences? Does it react to political or economic shocks? Also, knowledge about the relation among trust in different institutions needs to be deepened. Do they share the same determinants? Do they influence each other? How are they related to generalized trust?

Supplementary material. To view supplementary materials for this article, please visit https://doi.org/10.1017/S1744137418000279.

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