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Trust in institutions and the profile of inequality

A worldwide perspective

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Abstract: This paper investigates the importance of accounting for the profile of inequality in the analysis of institutional trust. Drawing on individual data from 82 countries around the world over the 1981–2021 period, it sheds light on the potential limitations of exploring the impact of the income distribution's shape on trust, using—as is traditional in the literature—a single inequality indicator. Results suggest that total income inequality and institutional trust are positively associated but this aggregated result hides some troubling countervailing effects. In fact, when the whole profile of inequality is considered, institutional trust appears to be significantly and negatively related to inequality *between* different income groups in society—namely, between the poor, the middle class, and the rich—whereas it is positively associated with inequality *within* those income groups. Although some heterogeneities in these findings can be detected according to the country's level of development as well as according to personal characteristics related to political views, the profile of inequality does always matter. Thus, this paper indicates that limiting the analysis to one single inequality aggregator would only capture an average effect and hide a more complex underlying nexus between income distribution and institutional trust.

Key words: institutional trust, inequality, between-group inequality, within-group inequality, political preferences

JEL classification: D31, O15, Z13

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1 Introduction

In recent decades, rising inequality in many countries around the world has been among the most discussed phenomena and has come at the top of researchers' and policymakers' agendas. Reducing inequality is, in fact, one of the sustainable development goals at the heart of the 2030 Agenda for Sustainable Development adopted by all United Nations Member States in 2015.

This dynamic has prompted a renewed interest in understanding the socio-economic consequences of facing high (and even increasing) levels of inequality. Since the pioneering work of Kutznets (1955), a huge amount of work has been produced to investigate the relationship between inequality and the level of development or growth potential of countries; recent contributions include Brueckner and Lederman (2018), Litschig and Lombardi (2019), and Panzera and Postiglione (2021). Another branch of the literature, which has flourished more recently, goes beyond the nexus between inequality and 'economic capital' to explore the link between inequality and 'social capital', of which trust represents one of the most important components (e.g. Birkelund and Cherry 2020; Roth and Wohlfart 2018; Sands and de Kadt 2020).

It is to this field of the literature that we intend to contribute. We aim at deepening understanding of the relationship between inequality and institutional trust. In fact, while inequality has been on the rise, institutional trust has been slowly deteriorating over time (OECD 2017) and this is an alarming event, as it might weaken the social contract. Trust in institutions is at the basis of the legitimacy and sustainability of political systems. Especially in periods of crisis—such as the economic downturn of 2007–09, whose effects have been propagating for more than a decade, and the recent COVID-19 pandemic—a reduced level of trust in institutions may represent a barrier to the implementation of recovery procedures. Institutional trust is also a pillar of social cohesion as it affects governments' ability to govern and act without having to resort to coercion, which impacts transaction costs and efficiency. The efficacy of economic policies crucially depends on the compliance and cooperation of the population. Trust in institutions is essential for the working of the economy and economic growth. It is also key for investor and consumer confidence. Last, there is a persistent need for policy-makers to better understand the determinants of institutional trust against the background of increasing populist voting (Algan et al. 2017).

Thus, increasing awareness of the role played by inequality as a determinant of trust in institutions is of primary importance. The existing literature on the relationship between these two phenomena is, in fact, scant (among the few exceptions are Gould and Hijzen 2016 and Belabed and Hake 2018, discussed in Section 2) and—as is traditional in the study of the interpersonal trust–inequality nexus (see Barone and Mocetti 2015)—has entailed estimating a coefficient on a single inequality statistic in a regression, alongside other explanatory variables. However, there is a rooted consensus in the scientific community that it is not simply aggregate inequality that matters when evaluating its consequences on the society (see Voitchovsky 2005). Shedding light on its whole profile might disclose a more complex relationship, as inequality experienced at different parts of the distribution can play differing roles in the economy.

The current study suggests the advantages of implementing a granular perspective of inequality as a determinant of institutional trust. We account for inequality in different parts of the distribution, namely at the top, middle, and bottom, to shed light on the relationship between inequality and institutional trust. The empirical results support the main hypothesis that the profile of inequality matters for confidence in public institutions and suggest that inferences based on a single summary statistic could be misleading, as they might reflect an averaging of offsetting effects. By merging individual data on institutional trust from the World Values Survey with country-level data on

income inequality from the World Income Inequality Database on 82 countries around the world over the period 1981–2021, we show that the association between income inequality and trust in institutions is positive and statistically significant. When zooming in on the whole profile of inequality, we also show that this result is mainly driven by inequality within income groups, while inequality between income groups acts in the opposite direction—that is, it exerts a negative impact on the degree of the confidence in institutions. Our results are robust to different measures of inequality and trust. We, instead, detect a dependence of our results on the countries' level of development. While the main findings are confirmed for the case of low- and lower-middle-income countries, they are reversed for the case of high-income countries, possibly reflecting the existence of different social norms and attitudes toward inequality in countries characterized by different levels of economic development. Similarly, we detect some heterogeneities when replicating our analysis by distinguishing individuals according to their political views. Last, our analysis proves the different nature of institutional trust as compared with interpersonal trust, which may call for different policy recommendations.

Relative to the existing empirical literature on this topic, we offer four important contributions. The first is an instrumental one: the creation of a new database with estimates of inequality within and between different parts of the income distribution for 82 countries around the world between 1981 and 2021, which allows a perfect decomposition of the aggregate inequality estimates measured through the Gini coefficient and the mean log deviation (MLD). Our methodology can be extended to any inequality measure and complements the World Income Inequality Database, which is the source of the income distribution data for our analysis. Through these new estimates, we offer the first robust evidence on the association between the profile of inequality and institutional trust. Second, to the best of our knowledge, this is the first contribution that incorporates—in the analysis of the determinants of institutional trust—the whole profile of inequality and shows how this can help explain the association found between aggregate inequality and confidence in public institutions. Third, we show that inequality and its profile might affect institutional and interpersonal trust differently, indicating that the distinction between the different types of trust does matter. Last, this paper represents the first contribution to offer a global perspective on the inequality–trust nexus.

The reminder of the paper is structured as follows. Section 2 discusses the theoretical background. Section 3 describes the data and the empirical strategy. Section 4 shows the main results. Section 5 provides robustness checks. Section 6 concludes.

2 Theoretical background

A propaedeutic step in the analysis of the nexus between inequality and trust is the definition of trust. The literature distinguishes between interpersonal trust (particularized or generalized trust) and institutional trust. The former is expressed with respect to other individuals in society (friends, members of the family, other unknown individuals). The latter is expressed with respect to different types of institution (government, police, legal system, etc.). People can be very trustful with respect to other individuals while showing a high degree of distrust with respect to some or all institutions. Interest in interpersonal trust is motivated by the fact that this value reflects how much concern exists in a society for other people, in particular other people who face socio-economic disadvantages (Delhey and Newton 2005).

To explain and study institutional trust, two main approaches can be followed. The institutional performance approach considers institutional trust as a consequence of institutional performance. Institutional trust is often explained as an evaluation of and response to the perceived design,

performance, and outputs of institutions (Berg and Hjerm 2010; Godefroidt et al. 2017; Lühiste 2006; Mishler and Rose 2001; Suh et al. 2012). On the other hand, the social trust approach considers institutional trust as an extension of interpersonal trust, the idea being that institutional trust represents a positive externality generated by interpersonal trust (Mishler and Rose 2001, 2005; Suh et al. 2012). Social relations and cooperation among citizens promote trust and a sense of civic engagement, which are important for institutional trust (Guiso et al. 2004) and institutional compliance (Tabellini 2008).

The empirical literature unanimously agrees that there is a negative, although sometimes weak, relationship between inequality and interpersonal trust (see Jordahl 2009). Indeed, inequality is seen as a measure of class cleavage, so that societies will be more trusting if people are less divided by class distinctions (Alesina and La Ferrara 2000, 2002; Barone and Mocetti 2015; Berggren and Jordahl 2006; Bjørnskov 2007; Fisher and Torgler 2013; Gustavsson and Jordahl 2008; Jordahl 2009; Knack and Keefer 1997; Rothstein and Uslaner 2005; Uslaner 2002; Uslaner and Brown 2005; Zak and Knack 2001).[1] Such empirical results are corroborated by robust experimental evidence proving the existence of a strong negative relationship between inequality and interpersonal trust (D'Amato et al. 2022; Gallego 2016).[2] This negative effect is thus a consolidated evidence and is justified on the base of different arguments. In the presence of higher inequality, individuals feel more distant from others in the same society. This economic distance is translated into a social and behavioural distance in such a way that every individual in the same circumstance will act differently or will make different choices (for instance on how to share and finance public goods). Moreover, individuals might perceive the process that generated current inequalities as unjust. Therefore, they might be induced to think that others unjustly access better resources than they do, and hence they will be less inclined to accept and trust others.

Unlike those of interpersonal trust, the determinants of institutional trust have only recently received attention (Kaasa and Andriani 2021). Although interpersonal and institutional trust tend to be positively correlated, they refer to different phenomena within the sphere of individual and societal attitudes. Furthermore, there may be situations in which people express low interpersonal trust and tend to compensate for such social distrust by expecting that institutions will represent their interests (Aghion et al. 2010). Relevant contributions include Clausen et al. (2011) and Blanco and Ruiz (2013), who look at the impact of crime and corruption on institutional trust; Grimmelikhuijsen and Porumbescu (2013) and Porumbescu (2017), who examine the effect of transparency on trust in government; and Roussey and Deffains (2012), who consider the impact of juridical resources on trust in the juridical system.[3]

Looking at the determinants of institutional trust, and in particular at the impact of inequality, is relevant to an understanding of the sustainability of the social contract. In fact, while interpersonal trust helps to reduce transaction costs and, thus, is transformed into an engine for economic growth, institutional trust facilitates the efficient organization of society itself. This is particularly true of modern democratic societies, whose political outcomes strongly depend on the active participation of citizens, through voting, for instance (Hudson 2006). The studies previously mentioned are prominent in the literature on trust but none of them investigates the specific impact of inequality on institutional trust, nor its profile. In addition to being enlightening, such

[1] See also Ananyev and Guriev (2019), where inequality is introduced as a control variable to test the effect of income change on trust.

[2] Other works go beyond inequality measured in a purely monetary context and study the effect of inequality on trust in other non-monetary dimensions (e.g., Beugelsdijk and Klasing 2016; Hooge et al. 2009; Leigh 2006).

[3] See also Fungáčová et al. (2019) and Knell and Stix (2015), who look at the determinants of trust in banks.

an analysis would provide relevant information for policy-makers, which could be used to better shape public policies or to change the means through which public services are provided.

In a recent paper, Belabed and Hake (2018) use data from comparable household surveys across 10 countries in Central, Eastern, and Southeastern Europe (CESEE) over the 2009–15 period to show that regional and country income inequality are negatively and significantly correlated with the propensity to trust national governments. Gould and Hijzen (2016) focus on the United States over the period 1980–2012 and Europe over the period 2002–14. Their results provide robust evidence that, overall, inequality lowers an individual's sense of trust in institutions.

Our contribution goes beyond the hypothesis investigated in these works. In addition to considering a longer time horizon (from 1981 to 2021) and a worldwide perspective, we shine light on the mechanism that could explain the inequality–trust nexus by exploring the impact of the whole profile of inequality along each country's income distribution on the main outcome variable. To this end, we make use of the decomposability property of well known inequality indexes to investigate the role played by inequality within and between different parts of the distribution, and how this might explain the impact of aggregate inequality on trust. Moreover, we show that distinguishing between institutional and interpersonal trust does matter to an understanding of the consequences of inequality.

Hence, in this paper we argue that it is not only inequality in the whole distribution that matters when assessing its consequences on institutional trust. The profile of inequality is key, as inequality experienced at different parts of the distribution can play differing roles in the economy.

Recent developments in the literature have shown that inequality within different parts of the income distribution have different implications when it comes to evaluating the effect of inequality on the growth prospects of a society (e.g. Biswas et al. 2017; Frank 2009; Voitchovsky 2005). Bottom inequality is bad for growth because it implies higher levels of poverty, which, in the presence of credit constraints, make it difficult for the poor to acquire education. It might also lead to higher levels of crime and social instability. In contrast, a positive impact of top inequality on growth is interpreted as supporting the classic theoretical argument that considers higher inequality as a determinant of higher savings and hence as an ingredient of growth-enhancing investments (Van der Weide and Milanovic 2018). Since people's satisfaction with public institutions also depends on the economic performance of a country, often used as a metric to evaluate a government's actions, one may expect to observe similar patterns when focusing on institutional trust rather than growth. However, alternative interpretations of the inequality in different parts of the distribution are possible, thereby positing differing impacts on institutional trust. For instance, if an incentive effect prevails, higher inequality within each part of the distribution might increase confidence in public institutions that are judged to reward effort. In contrast, if an identification effect prevails, the higher the inequality within each income class, the lower will be the feeling of identification with the other members of the class. In such contexts, individuals will face alienation, which may ultimately be reflected in lower confidence in public institutions.

At the same time, high fragmentation between income groups could bring about 'social separatism', and antisocial behaviours might result, especially when income inequality is reflected by political polarization. This is a situation in which the rich get involved in lobbying activities to influence the introduction of policies that benefit themselves and result in hampering the growth opportunities of the poor. For instance, they might prevent the implementation of pro-poor and other policies, like spending on human capital or infrastructure, as well as appropriating the country's resources and subverting the legal and political institutions by rent-seeking and corruption (Easterly 2001; Glaeser et al. 2003). This thesis is supported by empirical evidence that

it is mostly top inequality that is holding back growth at the bottom (Van der Weide and Milanovic 2018). In the presence of social separatism, wealthy individuals do not have any interest in public services such as public health and education, so the quality of these services deteriorates as a consequence and poor individuals may find it harder to escape poverty (Bénabou 2000). In such a context, high inequality between income classes may result in low government spending and persistent high inequality, hence low trust in public institutions.

The profile of inequality is acquiring a central role in the political arena as well. Indeed, the increase in inequality in many countries around the world has been proven to be mostly due to the extraordinary increase in the income share held by the rich (Atkinson and Piketty 2007; Atkinson et al. 2011; Piketty 2014, 2021). Thus, incorporating concerns for inequality at the top of the distribution is important in the design of public policy. Proposals for higher top income tax rates, for example, have been formulated following the increasing awareness of the rise of top income shares. Governments' failure to comply with such proposals could be an additional source of people's dissatisfaction with and distrust of national institutions. Based on the performance approach, higher values of between-group inequality might negatively impact institutional trust, as a reflection of the fact that individuals perceive such high values as symptoms of the ineffectiveness of public policies to alleviate income disparities across social classes.

A mirroring argument can, however, be made: higher inequality between groups implies that the rich will further enlarge their income share and hence their savings, which will be translated into higher growth, on the assumption that the higher the level of income the higher the marginal propensity to save. These increases will eventually benefit the poor, since economic growth increases the probability of providing more public good, thus higher trust in government. A cooperation approach can also be used to conjecture the existence of a relationship between institutional trust and inequality between income groups. With high between-group inequality, the contribution of the rich to the public good becomes crucial. Consequently, the poorer classes may tend to condition their contribution to that of the rich. At the same time, the dependence of the poor on cooperation with the rich might push the poor towards social engagement and prosociality and, using the social trust approach, this might be reflected in higher institutional trust (e.g. Markussen et al. 2021; Martinangeli and Martinsson 2020). If the idea of free riding is more pervasive, the opposite argument can be made and thus inequality between rich and poor would impact negatively on trust.

Last, the profile of inequality is also relevant when observed from the perspective of relative concerns theory, according to which people have social preferences, so that their utility—which typically depends on personal consumption—also depends on the consumption or utility levels of others. Some theories of relative concerns predict negative welfare effects when friends and neighbours become better off. Models of 'envy' assume that any improvement enjoyed by richer individuals acts as a negative externality on one's own utility (Friedman and Ostrov 2008). In contrast, models of 'compassion' assume that a welfare improvement experienced by poorer individuals has a positive effect on own utility (Bolton and Ockenfels 2000). It is then possible to infer that while, under models of envy, individuals may be more sensitive to inequality at the top end of the distribution, in models of compassion it is inequality at the bottom that matters more. In more referenced models, envy and compassion coexist but they are combined in such a way that the negative effect of an income increase of a richer individual more than outweighs the positive effect of an income increase of a poor individual (Fehr and Schmidt 1999). Thus, distinguishing between different types of inequality is fundamental to an understanding of the actions that can be put in place in order to strengthen the level of confidence in public institutions, as individuals may be more prone to accepting one type of inequality while fighting to reduce another.

This discussion brings us to hypothesize that there exists a relationship between aggregate inequality and institutional trust and, at the same time, to remain agnostic on its sign, as it can be the result of compensating effects and thus might hide the counteracting effects of the association found between different types of inequality and trust in institutions.

3 Data and method

To explore the relationship between income inequality and institutional trust, we merge data extracted from two official surveys, namely the World Values Survey (WVS)–European Values Survey (EVS) integrated dataset[4] and the UNU-WIDER World Income Inequality Database (WIID).

Data on trust are collected by the WVS–EVS dataset. This consists of nationally representative surveys conducted in 115 countries that contain almost 90 per cent of the world's population, using a common questionnaire, currently including interviews with almost 650,000 respondents. The universe of the WVS–EVS is represented by all persons aged 18 and older residing within private households in each country, regardless of their nationality, citizenship, or language. The minimum sample size—i.e. the number of completed interviews that are included in the national dataset in each country—is about 1,200. We use seven waves of the WVS–EVS covering the period from 1981 to 2021. Trust in institutions is measured at the individual level with the answer that interviewees give to the following question: 'Could you tell me how much confidence you have in the government: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?'. Thus, our outcome variable is an ordinal variable composed of four categories.

Data on inequality are collected by the WIID created by UNU-WIDER, first launched in 2000, providing information on income inequality for 200 economies in an organized and accessible manner. We use the WIID standardized version (UNU-WIDER 2021), which contains information on the average income of each percentile of the income distribution (based on GDP). Using this information, each country can be represented as a 100-dimensional vector of real numbers, allowing us to estimate the whole profile of inequality. We focus on income inequality rather than on inequality in terms of other economic relevant variables; this choice is motivated by the need to ensure the country and time coverage needed for our research purposes. As inequality indicator we use the Gini coefficient (the MLD will also be used for robustness purposes at the end of the empirical analysis).

The combination of the WVS–EVS integrated dataset and the WIID induces us to focus on a subsample of 82 developed, developing, and transition countries observed over the period 1981–2021.[5]

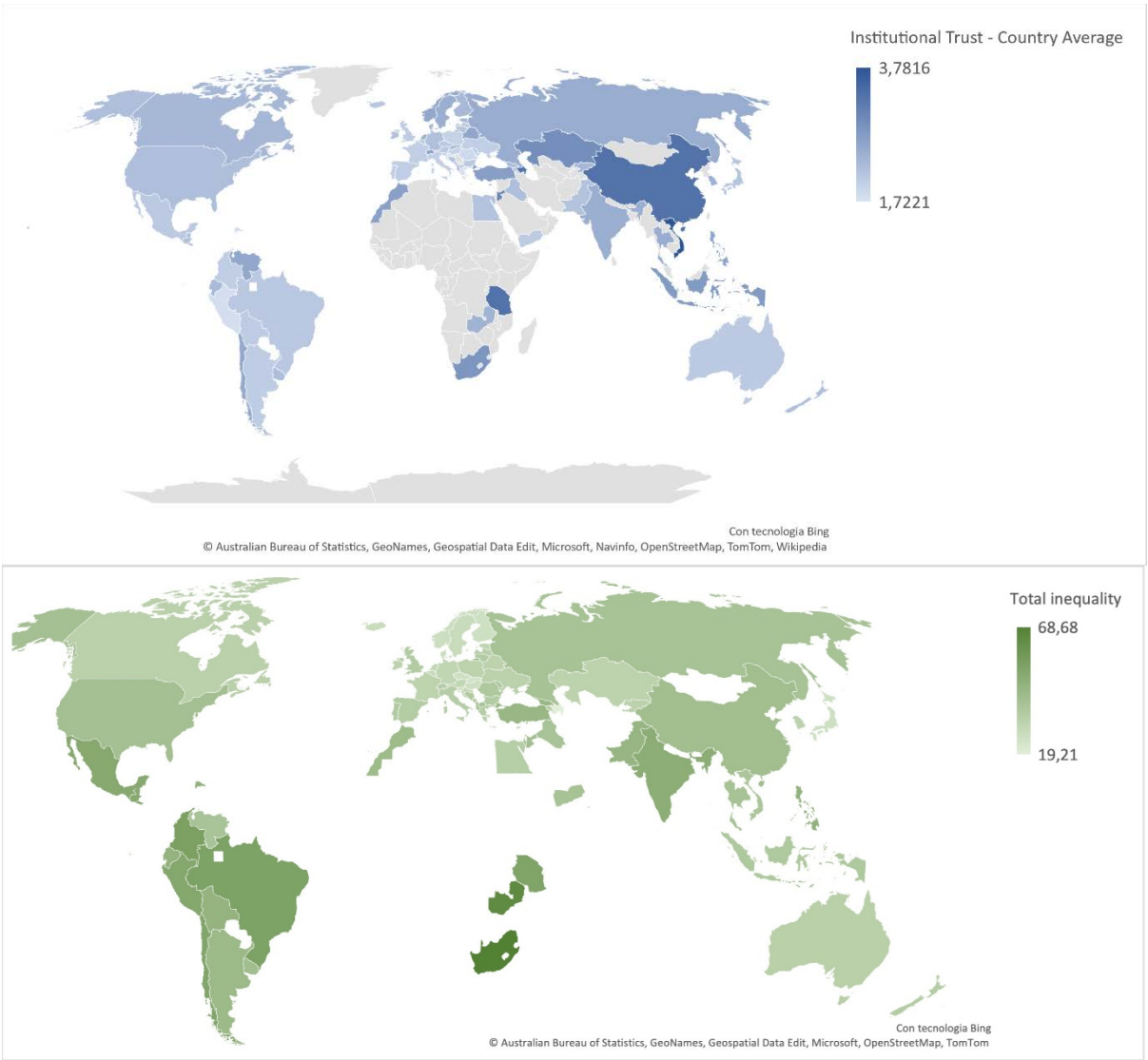
Figure 1 reports average institutional trust at country level—computed as the time average of the average scores at country level—and the time-average inequality in all countries in our sample. The

[4] The EVS and WVS are large-scale, cross-national, and repeated cross-sectional longitudinal survey research programmes. Since their emergence in the early 1980s, the EVS has conducted 5 survey waves (every 9 years) and the WVS has conducted 7 survey waves (every 5 years). Both research programmes include a large number of questions, which have been replicated over time and across the EVS and the WVS surveys. These repeated questions constitute the joint EVS–WVS time-series data, the Integrated Values Survey (IVS), which at the moment covers a 40-year period (1981–2021).

[5] Information about country and time coverage is available from the authors on request.

maps show a high degree of heterogeneity across countries. Europe is the world region with the lowest levels of confidence in government, but also the region with the lowest levels of inequality. East Asia shows the highest levels of institutional trust, while the highest levels of inequality characterize parts of Latin America and southern Africa. Thus, it appears that there exists a positive, although weak, relationship between the two. However, as extensively explained above, this positive nexus may hide some other, more complex relationship between the phenomena under investigation.

Figure 1: Institutional trust in the world (1981–2021)



Source: authors' illustrations based on WVS–EVS and WIID data.

To shed light on this issue, we proceed by estimating the whole profile of inequality, departing from the income percentile distribution provided by the WIID. In detail, we estimate inequality in the lower (bottom 40 per cent), middle (between the 41st and 80th percentiles), and upper (top 20 per cent) parts of the distribution. These three Gini indexes are a measure of within-group inequality that is complemented by an estimate of inequality between these three income groups. Hence, our whole profile of inequality is generated by four indicators of inequality: three indicators of within-income-group inequality (Gini index computed in the three different parts of the distribution) and one indicator of between-group inequality. Notice that, since we work on income percentile distributions, the estimation of the above-listed indexes represents a perfect

decomposition of total income inequality, thus allowing us to account for the many facets of inequality in the same distribution of income.[6] To the best of our knowledge, this is the first paper to consider the whole profile of inequality as a determinant of a relevant socio-economic variable. Previous research focusing on inequality profiles accounts only for some of the inequality components and measures these sub-components of inequality though indices whose functional form is mathematically different from that used to measure aggregate inequality—thus failing to produce a whole and coherent profile of inequality.

Hence, we estimate the following linear probability model.[7]

$$ITrust_{i,c,t} = \alpha + \beta Ineq_{c,t} + \gamma X_{i,t} + \rho Y_{c,t} + \mu_c + \tau_t + \varepsilon_{i,t} \quad (1)$$

where i denotes the individual, c refers to the country, and t indicates the year, with some gaps leading to an unbalanced panel. $ITrust_{i,c,t}$ is the dependent variable measuring individual trust in the national parliament; $Ineq_{c,t}$ is (the list of) our main independent variable(s), namely income inequality for the whole distribution or sub-groups. In our main specifications we look at inequality within percentiles 1–40, 41–80, and 81–100, and inequality between these three income groups, using Gini indices. We use the Gini index as our inequality measure for the cases of both aggregate and granular inequality, rather than the quantile ratios mostly used by the previous literature as a proxy for the latter. Being a function of the pairwise income differences across individuals, the Gini coefficient measures interpersonal differences more accurately than quantile ratios. Furthermore, the use of the same index to proxy total inequality and its profile allows a coherent comparison between the effect of each of these types of inequality on institutional trust.

$X_{i,t}$ is a set of individual control variables and $Y_{c,t}$ the set of country controls described below. Finally, we include country- (μ_c) and time-fixed effects (τ_t) to control for country-specific unobserved factors (e.g. constitutional features) and common shocks (e.g. global crises); $\varepsilon_{i,t}$ is the error term.

$X_{i,t}$ represents the vector of socio-demographic covariates. It includes age (*Age*) and age squared (*Age*^{2}), a dummy variable indicating the gender of the interviewee (*Gender*), and a factor variable indicating her education attainment (*Education*). These are standard demographic variables to control for. We also include a factor variable indicating the employment status of the interviewee (*Empl*).

The vector of control variables $Y_{c,t}$ has been defined following the recent empirical literature on the determinants of trust in public institutions as well as of generalized trust (e.g., Ananyev and Guriev 2019; Barone and Mocetti 2015; Olivera 2015; Stevenson and Wolfers 2011; Wroe 2016). The control variables are also selected in order to include the highest number of countries in our sample. We include: a variable capturing a country's economic development measured by GDP per capita (*GDP*); a variable containing demographic characteristics, such as the share of population living in urban areas (*Urban*); and a variable that accounts for labour market status,

[6] A well known feature of the Gini coefficient is that it cannot be, in general, perfectly decomposed into within- and between-group inequality. This is because, if group distributions overlap, the Gini decomposition generates a residual. In our setting, there is no overlapping between the three income classes so that the residual term is zero.

[7] We use a linear probability model even though our dependent variables are categorical both to ease the interpretation of the results and because we include several fixed effects that might bias the estimates in a nonlinear model. However, our results do not change significantly when using an ordered probit model. The estimation results using ordered probit are available on request.

measured by the unemployment rate (*Unempl*). Descriptive statistics and detailed definitions and sources of all the variables are reported in Table A1 in the Appendix.

4 Results

Table 1 reports the main results of our analysis. The first three columns present the results of three different specifications of model (1) when $Ineq_{i,t}$ contains only the Gini index for the whole distribution. In detail, we start with a parsimonious model with only aggregate inequality (together with country- and time-fixed effects) in column (1). In the second column we add the individual-level controls and in the third column the country-level controls. There is shown to be a positive association between inequality and level of trust in public institutions. This effect is statistically significant across all specifications. For increasing values of income inequality, the level of trust increases, suggesting that, in general, inequality might not be detrimental to institutional trust in our sample of countries. This striking result greatly differs from previous studies on institutional or interpersonal trust, in specific regions of the world, which all point to a negative relationship. Our analysis confutes these findings by showing that, when a worldwide perspective is adopted, inequality may appear to boost institutional trust. At first glance, this remains a counterintuitive result, which calls for further investigation. In this paper we argue that the positive correlation between institutional trust and total inequality is the result of countervailing effects stemming from the profile of inequality.

Table 1: Institutional trust, inequality, and its profile

	Dependent variable: Institutional trust					
	(1)	(2)	(3)	(4)	(5)	(6)
Aggregate inequality	0.0202***	0.0162***	0.0150***			
	(0.00112)	(0.00118)	(0.00130)			
Inequality between				-0.0254***	-0.0182**	-0.0275***
				(0.00689)	(0.00710)	(0.00736)
Inequality (1–40)				0.00178	-1.97e-05	0.00437*
				(0.00224)	(0.00226)	(0.00234)
Inequality (41–80)				0.0867***	0.0729***	0.0760***
				(0.00892)	(0.00936)	(0.0100)
Inequality (81–100)				0.0191***	0.0125***	0.0151***
				(0.00323)	(0.00334)	(0.00336)
Individual-level controls						
Female		-0.00216	-0.000961		-0.00263	-0.00125
		(0.00368)	(0.00386)		(0.00368)	(0.00386)
Age		-0.00373***	-0.00345***		-0.00368***	-0.00348***
		(0.000642)	(0.000674)		(0.000642)	(0.000674)
Age squared		6.35e-05***	6.09e-05***		6.30e-05***	6.14e-05***
		(6.90e-06)	(7.23e-06)		(6.90e-06)	(7.23e-06)
Employment status:						
Part-time		-0.000739	0.000414		0.000236	0.00117
		(0.00690)	(0.00714)		(0.00690)	(0.00714)
Self-employed		-0.00796	-0.0113		-0.00829	-0.0117*
		(0.00673)	(0.00710)		(0.00672)	(0.00710)
Retired		0.00134	0.000666		0.00169	0.000125
		(0.00717)	(0.00753)		(0.00717)	(0.00753)
Housewife		0.0248***	0.00848		0.0253***	0.00870
		(0.00673)	(0.00718)		(0.00673)	(0.00718)

	Dependent variable: Institutional trust					
	(1)	(2)	(3)	(4)	(5)	(6)
Student		0.0230***	0.0399***		0.0234***	0.0397***
		(0.00852)	(0.00900)		(0.00852)	(0.00900)
Unemployed		-0.0443***	-0.0412***		-0.0427***	-0.0409***
		(0.00704)	(0.00740)		(0.00704)	(0.00740)
Other		-0.0526***	-0.0580***		-0.0513***	-0.0571***
		(0.0126)	(0.0132)		(0.0126)	(0.0132)
Education level:						
Middle		-0.0691***	-0.0603***		-0.0680***	-0.0593***
		(0.00481)	(0.00504)		(0.00481)	(0.00504)
Upper		-0.0573***	-0.0410***		-0.0565***	-0.0402***
		(0.00531)	(0.00556)		(0.00531)	(0.00556)
Country-level controls						
GDP per capita			8.29e-06***			9.94e-06***
			(1.86e-06)			(1.87e-06)
Unemployment			-0.0105***			-0.00523***
			(0.00141)			(0.00154)
Urban population			0.0310***			0.0325***
			(0.00182)			(0.00181)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
N Observations	250,439	241,346	213,435	250,439	241,346	213,435
R-squared	0.161	0.161	0.172	0.161	0.161	0.172
p>F	0.000	0.000	0.000	0.000	0.000	0.000

Note: robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The constant and country- and year-fixed effects are included but their coefficients are not reported in the table.

Source: authors' elaboration based on WVS–EVS and WIID data.

In an attempt to provide a reasonable explanation for these findings, we estimate model (1) substituting for aggregate inequality its profile, that is, considering inequality in the bottom 40 per cent of the distribution, inequality between 40 and 80 per cent of the distribution, inequality in the top 20 per cent of the distribution, and inequality between these income classes. The results are gathered in columns (4) to (6). Again, we start with a parsimonious model with only the inequality measures (together with country- and time-fixed effects) in column (4) and progressively add individual-level controls (5) and country-level controls (6).

The sign and the significance of these estimates reveal that it is not only aggregate inequality that matters. Indeed, we inspect the existence of significant countervailing associations between inequality and trust in government. The positive association proven in Table 1 columns (1)–(3) is confirmed by all the within-inequality indexes, with the exception of inequality within the bottom 40 per cent of the distribution, whose sign of association appears to be negative in one out of the three specifications, although it remains statistically non-significant. Inequality within the middle-income groups and within the richest 20 per cent of the distribution, instead, are positively and significantly associated with trust. In contrast, inequality between these income groups turns out to be negatively and significantly associated with trust. Thus, the results in Table 1 corroborate our main hypothesis.

In interpreting these results, it may be noted that the three income groups considered can be associated with the classic distinction between lower, middle, and upper class that characterizes public and political debates. We must acknowledge the existence of theories of social justice that

go beyond this simple tripartition of the population, to look at more articulated ways of identifying groups of similar individuals (e.g. Peragine et al. 2014) based on normative attitudes towards the definition of fair and unfair inequality. It is, however, hard to dispute the fact that the income-based tripartition is the most natural and intuitive way for the average citizen to identify groups of similar individuals. Therefore, from a positive perspective, if such a difference between fair and unfair inequality were to exist, we should expect it to appear in the different effects that between- and within-group inequality exert on institutional trust. For this reason, inequality between groups can be interpreted as a measure of 'unfair' inequality, that is the inequality between social classes, and inequality within a given income group as 'fair' or more tolerable inequality, which derives from the remuneration of effort. An exception to such an interpretation might concern inequality within the top 40 per cent of the income distribution, as this is positively correlated with poverty, which is a far more important source of injustice.

The negative correlation between trust and inequality between groups is then rationalizable under the performance approach. Individuals may perceive high between-class inequality as proof of the inability of institutions to effectively fight inequality. Moreover, even with functioning democracies, high between-group inequality makes it harder for many citizens to access political power. It is then natural to experience a feeling of distance from public institutions. While this dynamic may be beneficial for the rich, the social unrest and higher criminality induced by high inequality may severely counterbalance the potential benefits.

Inequality within income groups—which is interpretable as inequality among similar individuals—acts as an incentive effect. Individuals tend to evaluate positively the operations of public institutions that make it possible to realize an environment where individual effort is compensated. This effect seems to vanish in the case of the poorest individuals; higher inequality among the poor could also imply a higher probability of poverty, which outweighs the incentive effect. Conversely, between-group inequality—interpretable as inequality among dissimilar individuals—is less tolerated. It is considered more unfair because it is often due to factors outside individual control, e.g. the government's inability to effectively redistribute wealth, which is reflected in lower confidence in public institutions. In fact, as has been documented by the literature, trust in public institutions is the result of individual judgements of government actions when they compare what they think the government should do with what has actually been done (Bouckaert and van de Walle 2003). Higher inequality between groups increases individual feelings of distance. Moreover, high levels of between-income-group inequality raise concerns about the ability of those at the bottom of the distribution to support themselves and about the opportunity for all members of society to share in national prosperity. High inequality at the top of the income distribution is positively associated with economic performance and the potential for investment and future development. While the positive sign of the Gini (41–80) is partially justified by this dynamic, we may also observe that a mean-preserving higher dispersion in the middle of the distribution may reduce the perceived between-class inequality.

Individual characteristics also remain important for institutional trust. Women seem to be less confident in institutions, although this gender difference is not statistically significant. Age is negatively related with institutional trust, but this relationship is highly non-linear, as suggested by the coefficient for age squared. On average, younger people have had less interaction with public institutions than older individuals; therefore, they are less prone to express low levels of trust in institutions. This sign is confirmed when individuals' employment status is considered, as students appear to be more trusting of institutions than employed individuals. Not surprisingly, being unemployed increases institutional distrust. Last, the link between trust and education is also clear-cut: higher educational attainments erode citizens' trust in institutions.

As for the country-level controls, we observe some regularities across specifications in Table 1. The level of economic development of a country, measured though per-capita GDP, contributes to the extent of institutional trust, possibly because higher economic development implies that governments have higher resources to finance public goods and services. Living in urban areas is positively associated with trust, possibly because urban dwellers have closer contact with public institutions and can more easily benefit from the provision of public goods. Last, as expected, level of unemployment has a strong negative correlation with institutional trust, highlighting that individuals living in countries characterized by a malfunctioning labour market tend to be much less confident in institutions and their policies.

We then ask whether the analysis of the role played by inequality and its profile brings us to different conclusions when focusing on interpersonal trust rather than institutional trust. To answer this question, we replicate the above analysis using two measures of interpersonal trust as the main outcome variable. As shown in Table 2, the signs of the coefficients on almost all the inequality measures considered are reversed. This supports our argument that different information can be produced when shifting the focus from institutional to interpersonal trust. In detail, aggregate income inequality is negatively associated with generalized trust, corroborating results from existing empirical literature. Although generalized and institutional trust may be strongly correlated, they still refer to different aspects of social capital and their formation can be different. This justifies the focus on institutional trust to complement the existing analysis on inequality and trust. The estimates reported in columns (2) and (4) of Table 2 reveal that both within- and between-group inequality affect interpersonal trust differently from institutional trust. In fact, it is within-income-group inequality that harms trust, whereas between-group inequality appears to boost it. The only similarity between the two types of trust is that the impact of aggregate inequality on trust is mostly driven by within-group inequality.

Table 2: Inequality and trust: interpersonal trust

	Dependent variable: Trust in people you know		**Dependent variable: Trust in people met for the first time**	
	(1)	**(2)**	**(3)**	**(4)**
Aggregate inequality	-0.0123***		-0.0200***	
	(0.00214)		(0.00236)	
Inequality between		0.114***		0.00667
		(0.0157)		(0.0180)
Inequality (1–40)		-0.0566***		-0.0285***
		(0.00566)		(0.00668)
Inequality (41–80)		-0.218***		-0.105***
		(0.0243)		(0.0275)
Inequality (81–100)		-0.0326***		0.0123*
		(0.00628)		(0.00723)
Individual-level controls	YES	YES	YES	YES
Country-level controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Observations	129,374	129,374	127,010	127,010
R-squared	0.197	0.197	0.191	0.192
p>F	0.000	0.000	0.000	0.000

Note: robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The constant and country- and year-fixed effects, as well as individual- and country-level controls, are included but their coefficients are not reported in the table.

Source: authors' elaborations based on WVS–EVS and WIID data.

The results in Table 2 clearly show that institutional and interpersonal trust are different concepts. High inequality reduces interpersonal trust, as it increases the feeling of dissimilarity between people. Observe that this effect is particularly strong within the middle class, in line with the polarization that many countries are experiencing and the general feeling that the middle class is disappearing. The positive sign observed for Inequality Between can be associated with a countervailing effect that reduces the feeling of dissimilarity. Indeed, for fixed within-group inequality, higher Inequality Between implies greater distance between the average income in each group. As a consequence, for example, an individual in the low-income group will under-evaluate the income distance from another low-income individual when a middle-income individual is taken as reference. In a more formal way, we can say that the dissimilarity between two individuals in the same income group is a decreasing function of the average income in the other groups.

We deepen our understanding of the nexus between institutional trust and inequality by investigating the existence of potential heterogeneities.

First, we split our sample of countries into three sub-samples according to the income group classification of each county, following the standard partition proposed by the World Bank: low- and lower-middle-income countries; upper-middle-income countries; and high-income countries. The results are collected in Table 3 and reveal that the nature of the relationship between inequality and confidence in institutions depends on the level of economic development of a given country. In fact, the main results reported in Table 1 remain valid only for the group of low- and lower-middle-income countries. They are completely reverted for the case of high-income countries and are ambiguous in the case of upper-middle-income countries. This might reveal the existence of different social norms and different attitudes toward inequality.

Unlike poorer countries, developed countries witness a negative association between aggregate inequality and institutional trust. The sign of this association is determined by the within-income-group component but, as a second difference between the two groups of countries, this component seems to have a negative impact on trust in high-income countries as opposed to the positive sign that arises in less developed countries. Thus, it appears that in high-income countries the loss of identification that is generated when inequality among members of the same income group increases (e.g. Dayton-Johnson and Bardhan 2002) outweighs the incentive effect, undermining the institutional framework underpinning cooperation, which is reflected in lower levels of institutional trust. Arguably, as individuals tend to have reciprocity preferences, they are more prone to contribute to the public good as long as others reciprocate fairly (Fischbacher et al. 2001). From this perspective, inequality makes cooperation harder, as it is more difficult to determine what constitutes a 'fair' contribution in an unequal group. This might be reflected in lower-quality public services, which people may consider a failure of the public sector. Last, the sign defining the possible impact of between-income-group inequality on trust also diverges among countries. It is negative for the case of low- and middle-income countries, but positive for high-income countries. These results indicate that, while inequality between income groups is perceived as a form of class cleavage in less developed countries, this is not the case for developed countries. The results are also consistent with the view that rising inequality harms collective action in developing countries, and that this relationship is intensified by pessimistic expectations about cooperation, which may in turn be generated by high levels of corruption and low levels of institutional trust.

Table 3: Inequality and trust by countries' level of development

	Dependent variable: Institutional trust					
	High income		Upper-middle income		Lower-middle and low income	
	(1)	(2)	(3)	(4)	(5)	(6)
Gini	-0.0163***		-0.00307		0.630***	
	(0.00300)		(0.00218)		(0.0251)	
Inequality between		0.126***		-0.0563*		-4.105***
		(0.0154)		(0.0311)		(0.172)
Inequality (1–40)		-0.0650***		-0.00859*		1.304***
		(0.00609)		(0.00441)		(0.0637)
Inequality (41–80)		-0.296***		0.209***		6.225***
		(0.0240)		(0.0328)		(0.256)
Inequality (81–100)		-0.00392		-0.0105		0.121***
		(0.00530)		(0.0196)		(0.0108)
Individual-level controls	YES	YES	YES	YES	YES	YES
Country-level controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES
Observations	108,991	108,991	79,209	79,209	25,235	25,235
R-squared	0.117	0.120	0.220	0.221	0.219	0.219
p>F	0.000	0.000	0.000	0.000	0.000	0.000

Note: robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The constant and country- and year-fixed effects, as well as individual- and country-level controls, are included but their coefficients are not reported in the table.

Source: authors' elaborations based on WVS–EVS and WIID data.

We now explore heterogeneities in individual characteristics. We distinguish individuals according to their view on the redistributive role of the government. We consider individuals agreeing with the view that the government should tax the rich and subsidize the poor and individuals disagreeing with that view. The results are collected in Table 4 and reveal that, while aggregate inequality is always positive and significant, the profile of inequality matters only for individuals that support the redistributive role of the state. These findings corroborate the performance approach concerning inequality between groups and the incentive approach concerning inequality within groups. These individuals strongly believe that public institutions should ensure equity in society by implementing redistributive policies. Previous literature has argued that government intervention to solve collective action problems is not always desirable, and that cooperation among individuals would instead outperform it (Ostrom 1990). However, recent analyses also prove that poor individuals contribute a larger share of their endowment to public goods production than rich individuals (Martinangeli and Martinsson 2020). When coupled with our analysis on institutional trust, this has important implications, which allow us to infer that tax-based systems may be more egalitarian than systems based on voluntary commitment and may be beneficial for institutional trust, so that government intervention may be superior to community-based solutions. Indeed, individuals who do not believe the government should redistribute are likely either to be insensitive to inequality (maybe because they deem it 'fair') or to believe that the most efficient redistribution is effected by market forces. Consequently, they do not blame institutions for the observed inequality. At the same time, those who believe that the government should intervene and redistribute wealth blame the institutions for the observed inequality, so that more egalitarian policies would not only improve social welfare but also positively impact institutional trust.

Table 4: Inequality and trust by support for redistribution

	Dependent variable: Institutional trust			
	'Governments should tax the rich and subsidize the poor'			
	Against		In favour	
	(1)	(2)	(3)	(4)
Aggregate inequality	0.00995**		0.0143***	
	(0.00440)		(0.00146)	
Inequality between		-0.0113		-0.0194**
		(0.0338)		(0.00823)
Inequality (1–40)		0.0158		0.00298
		(0.0128)		(0.00267)
Inequality (41–80)		0.0770		0.0579***
		(0.0523)		(0.0113)
Inequality (81–100)		-0.00454		0.0143***
		(0.0134)		(0.00384)
Individual-level controls	YES	YES	YES	YES
Country-level controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Observations	45,106	45,106	168,329	168,329
R-squared	0.213	0.213	0.165	0.165
p>F	0.000	0.000	0.000	0.000

Note: robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The constant and country- and year-fixed effects, as well as individual- and country-level controls, are included but their coefficients are not reported in the table.

Source: authors' elaborations based on WVS–EVS and WIID data.

5 Robustness

To conclude our analysis, we perform a set of robustness checks. First, we add as an explanatory variable the variations in the macro indicators to account for time trend (Table A2 in the Appendix, columns (1) and (2)). Second, we consider an alternative indicator of inequality. Thus, we compute bottom, middle, and top inequality using the mean log deviation and we run equation (1) using these alternative estimates of inequality (Table A2, columns (3) and (4)). We again estimate equation (1), focusing on trust in parliament as opposed to trust in government (Table A2, columns (5) and (6)). The results of these additional analyses show that our main conclusions hold.

Last, the small number of countries can in principle represent a source of bias in our estimates, given that the main explanatory variables are measured at country level. To account for this, we perform jackknife tests, where the sample of each specific country is successively dropped from the estimations. As reported in Figure A1 in the Appendix, our main results hold. Apart from a few exceptions, the coefficients on inequality are stable and statistically significant across different samples obtained when dropping one country at a time.

The preceding analysis has shown significant relationships between trust and aggregate inequality, which can be decomposed into countervailing effects stemming from the profile of inequality. Nevertheless, there can be a problem of reciprocal causality between inequality profile and institutional trust. Inequality in and between different parts of the distribution can lead to a heterogeneous impact on trust, as discussed so far. At the same time, however, there can be both

a virtuous and a vicious cycle, with trust being reflected in different profiles of inequality in different countries. This potential for bi-directional causation complicates the interpretation of the partial correlation between profile of inequality and confidence in institutions, generating a classic identification problem. However, we also note that the problem of reverse causality may not be so severe in this context, given that the independent variables, the inequality indexes, are measured at aggregate national level, while the outcome variable refers to individual behaviours. It would take some time for the virtuous/vicious effects of the erosion of trust to become apparent and hence social capital to be reflected in inequality, considering that this variable is not changing fast across years. But even if we were willing to address reverse causality and endogeneity using instrumental variables techniques, finding valid instruments in this context is very difficult and the exclusion restrictions that scholars impose on them are often theoretically difficult to justify (see Sovey and Green 2011), especially in our context, where it is not simply aggregate inequality that would need to be instrumented but its whole profile. Thus, we do not intend to identify causality in our results.

6 Conclusions

The central hypothesis of this paper has been that the sign of the relationship found between inequality and institutional trust may hide opposite evidence regarding the association of inequality in different parts of the income distribution with institutional trust. The empirical analysis undertaken in Section 4 supports this hypothesis. We show that the aggregate positive effect is mostly explained by the impact of inequality on institutional trust within income groups. Inequality between income groups acts in the opposite direction by hampering the building of confidence among individuals in their institutions. An important contribution of this study is to highlight the potential limitation of investigating the effect of income distribution on trust—and more generally on social capital—using a single inequality index.

From a policy perspective, our empirical findings contribute to widening knowledge about the determinants of trust in institutions and the factors that might alleviate the adverse effects of income inequality on trust. Redistributive policies financed via the proportional taxation of top incomes are likely to promote institutional trust by reducing between-group inequality and inequality in the bottom part of the distribution, while preserving relative inequality at the top.

In comparison with previous studies, we use more consistent estimates of the profile of inequality and more robust methodologies. The combination of these ingredients produces additional innovative evidence related to the distinction between institutional and interpersonal trust in the assessment of the impact of inequality on social capital. Although the two tend to be positively correlated, their origins (and their consequences) may be different. It might be inferred that an analysis of the determinants and effects of social capital that only uses a measure of generalized trust as a proxy might produce misleading or incomplete information.

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Appendix

Table A1: Definitions of variables and descriptive statistics

Variables	Definition	Source	Mean	Std. dev.	Min.	Max.	Obs.
Trust	Could you tell me how much confidence you have in the government: is it [1] a great deal of confidence, [2] quite a lot of confidence, [3] not very much confidence, or [4] none at all?	WVS–EVS	2.33	0.93	1	4	219,926
Aggregate inequality	Gini coefficient of household equivalent disposable income, whole distribution	WIID	37.51	9.21	17.71	70.13	219,926
Inequality between	Gini coefficient of household equivalent disposable income, between bottom 40%, 41–80%, and top 20% of the distribution	Own elaborations based on WIID	32.41	8.02	15.25	60.58	219,926
Inequality (1–40)	Gini coefficient of household equivalent disposable income, within bottom 40% of the distribution	Own elaborations based on WIID	20.04	5.13	8.18	41.88	219,926
Inequality (41–80)	Gini coefficient of household equivalent disposable income, within 41–80% of the distribution	Own elaborations based on WIID	11.41	3.18	5.45	25.26	219,926
Inequality (81–100)	Gini coefficient of household equivalent disposable income, within top 20% of the distribution	Own elaborations based on WIID	21.93	6.90	7.66	47.01	219,926
Age	Age in years of interviewees	WVS–EVS	44.35	17.20	15	103	219,926
Age squared	Age in years, squared, of interviewees	WVS–EVS	2,261	1,655	225	1,069	219,926
Gender	Gender of interviewees: 0 Male, 1 Female	WVS–EVS	1.53	0.50	0	1	219,926
Educational level	Educational level of interviewees: [1] lower; [2] middle; [3] upper	WVS–EVS	2.00	0.75	1	3	219,926
Employment status	Employment status of interviewees: [1] full-time employed; [2] part-time employed; [3] self-employed; [4] retired; [5] housewife; [6] student; [7] unemployed; [8] other	WVS–EVS	3.19	3.13	1	8	219,926
GDP	Per capita GDP in PPP, 2020 constant prices	World Bank (WDI)	26,849	19,641	1423	118,154	219,926
Urban	Urban population share: people living in urban areas as defined by national statistical offices as a percentage of the total population	World Bank (WDI)	67.93	15.86	22.67	100	219,926
Unemployment	Unemployment rate	World Bank (WDI)	8.43	6.20	0.25	34.50	219,926

Source: authors' construction based on sources shown.

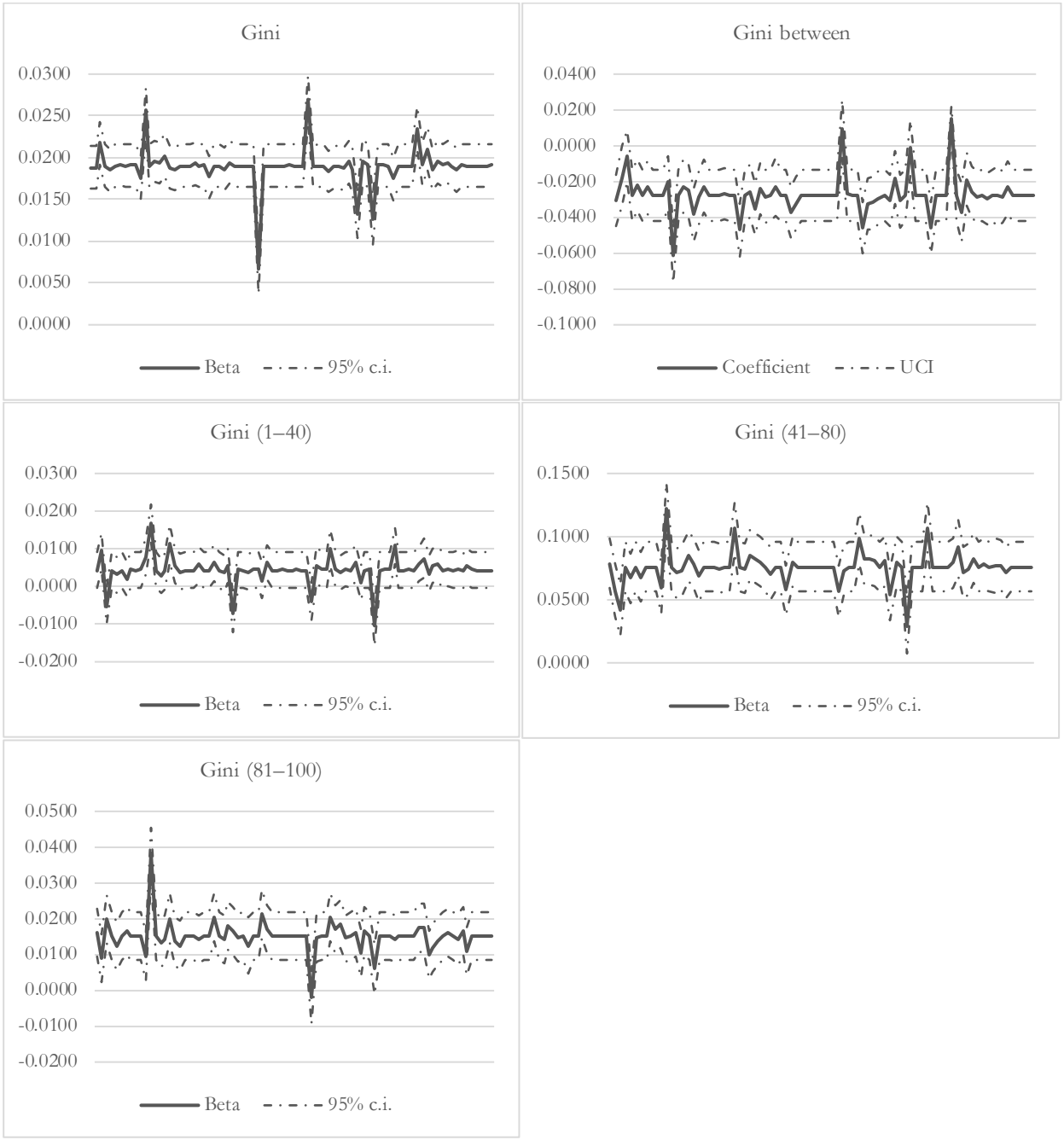
Table A2: Inequality and trust: robustness

	Dependent variable: Institutional trust					
	Robustness to time trend		Robustness to inequality index		Robustness to trust measure	
	(1)	(2)	(3)	(4)	(5)	(6)
Inequality	0.0131***				0.00760***	
	(0.00251)				(0.00114)	
Inequality between		-0.133***				-0.0131**
		(0.0129)				(0.00657)
Inequality (1–40)		0.0358***				0.00331
		(0.00487)				(0.00215)
Inequality (41–80)		0.246***				0.0154*
		(0.0181)				(0.00876)
Inequality (81–100)		0.0488***				0.0163***
		(0.00551)				(0.00307)
MLD			0.00960***			
			(0.00156)			
MLD between				-0.0530***		
				(0.00731)		
MLD (1–40)				0.00305*		
				(0.00165)		
MLD (41–80)				0.501***		
				(0.0394)		
MLD (81–100)				0.0438***		
				(0.00690)		
Individual-level controls	YES	YES	YES	YES	YES	YES
Country-level controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES
Observations	130,076	130,076	130,076	130,076	220,134	220,134
R-squared	0.185	0.187	0.185	0.187	0.177	0.177
p>F						

Note: robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' elaborations based on WVS–EVS and WIID data.

Figure A1: Inequality and trust: jackknife



Source: authors' elaborations based on WVS–EVS and WIID data.