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Trust in public institutions, inequality, and digital interaction: Empirical evidence from European Union countries

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ABSTRACT

Declining institutional trust is one of the central problems in modern societies. Identifying its determinants, among which inequality, is fundamental for designing suitable interventions to restore confidence in institutions and preserve the social contract. We study the relationship between the two phenomena for EU-28 countries over the period 2003–2019. We use OLS and IV estimations to show that increasing income inequality is significantly associated with reduced trust in national governments. We also find that citizens' digital interaction with the public administrations represents a mitigating channel as it contributes to shrinking the adverse effect of inequality on institutional trust, especially for more vulnerable categories in society, such as individuals with low educational attainment and those who are unemployed. These new insights might be particularly helpful for the government's agenda to meet transparency goals and provide more digital public services. From a policy viewpoint, redistribution policies combined with a well-established *e-relationship* between citizens and governments may be the road to restore trust in institutions.

1. Introduction

In this paper we explore how trust in public institutions may be affected by income inequality, which is among the primary sources of political instability, thus potentially leading to distrust in governments (Aghion et al., 2010; Bejarano et al., 2021). Nowadays, distrust is one of the central problems in advanced economies, and identifying its determinants becomes fundamental for designing suitable interventions to restore confidence in institutions and preserve the social contract. In fact, trust in public institutions induces citizens to recognize and accept the validity of their political system's rules and their rulers' decisions. Thus, trust becomes a fundamental ingredient for making political systems more resilient to survive periods of crisis (like that started in 2007 related to the economic downturn and the most recent related to the Covid-19 pandemic). During such periods, institutional distrust may represent a barrier to implementing those policies aimed at restoring economic stability and, consequently, hamper the effectiveness of the

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government's action (Besley and Dann, 2023).¹

The appearance of such modest levels of trust in many institutions, like government and media, has been accompanied by increasing discontent toward the high levels of income inequality exhibited in a vast number of countries in the past two decades (Algan et al., 2017; Alvaredo et al., 2017). Hence, understanding whether a link exists between income inequality and institutional trust seems of prominent importance.

We focus on trust in public institutions as measured by citizens' confidence in governments. Merging data from the Eurobarometer and the European Union Statistics on Income and Living Conditions (EU-SILC) surveys run over a sample of households living in 28 European Union (EU) countries over the 2003–2019 period, we find a robust negative and statistically significant relationship between income inequality and trust in public institutions.

Differently from recent empirical evidence on the determinants of institutional trust (Kaasa and Andriani, 2022; Bellantuono et al., 2023; Bobzien, 2023) using big data techniques and multilevel analysis, the estimation methods adopted in this paper help to account for endogeneity and reverse causality issues. It also helps to disentangle the role played by a specific economic phenomenon, that is income inequality, rather than considering multiple phenomena at the same time.

Empirical works assessing the causal relationship between inequality and trust are mostly experimental and focus on interpersonal trust rather than institutional trust (Olivera, 2015; Barone and Mocetti, 2016; Fehr et al., 2020; Kanitsar 2022; Xu and Marandola, 2023). Although interpersonal and institutional trust tend to be positively correlated (Kaasa and Andriani, 2022), they refer to distinct phenomena, and their roots may be different. There may be situations in which people express low interpersonal trust and tend to compensate for such distrust by expecting that institutions will represent their interests, hence conveying higher institutional trust (Aghion et al., 2010). The recent literature investigating the relationship between institutions and interpersonal trust shows that when institutions are trusted, they increase feelings of security, and therefore promote interpersonal trust too (Spadaro et al., 2020). Hence, we contribute to this literature by focusing on institutional trust as a more challenging and disputed aspect, especially in recent times characterized by economic crises, political instability, and pandemic events around the world.

Given our main results, we also explore the citizens' use of digital services as a mitigating channel for the trust-inequality relationship since this kind of interaction might increase the individuals' perception of public institutions' transparency and, ultimately, the level of trust in them (Porumbescu, 2017; Babutsidze et al., 2021). We find that the diffusion of digital connections between citizens and the public sector helps to lessen the detrimental effect of inequality on trust. This holds particularly true for more fragile individuals in society, such as the less educated and those unemployed. Thus, our work also contributes to the literature on the socio-economic impact of digitalization and e-government (see MacLean and Titah, 2023). However, while this literature focuses on the direct impact of the digital citizen-government relationship on trust, our work also shows that *e-government* can work as a transmission channel, hence amplifying its public value features.

From a policy perspective, the new insights on the role of digital interaction for the trust-inequality relationship might be particularly helpful for the agenda of the national governments, which are increasingly called upon by the public at large to meet transparency goals and making available some public services through new technological tools.

The rest of the paper is structured as follows. Section 2 provides a theoretical background: first, it defines institutions and the concept of trust toward them; then, it presents the testable hypotheses based on how inequality could affect institutional trust. Section 3 describes the data and the estimation strategy implemented in this paper and presents some stylized facts on the evolution of income inequality and institutional trust over time. Section 4 shows the baseline results, including some robustness checks to endogeneity; it also presents the results of digital interaction between citizens and public authorities as a potential mitigating channel in the trust-inequality relationship. Section 5 concludes with some policy implications.

2. Theoretical background

2.1. Institutions: definition, determinants, and trust

Following North (1991), the literature has adopted the term “Institutions” in economics to refer to a set of formal and informal norms and rules - that are nevertheless established and prevalent - that structure individual interactions. Acemoglu et al. (2005) propose a more nuanced definition of institutions as a result of three factors: *Economic institutions* (factors generating the system of incentives and the distribution of resources in a society); *Political power* (the relative political power of different groups with conflicting interests; its distribution in the society determines the design and the quality of economic institutions); *Political institutions* (they allocate political power across groups and are linked to the characteristics of the government and the design of the constitution). The interactions between these three notions govern institutions' growth and development, but also the reverse causal effects of the economy on institutions.

Hence, institutions shape individual and collective attitudes, affect individuals' choices, and create expectations of the behavior of other individuals in the same society (Acemoglu et al., 2006). Moreover, they both enable and constrain behavior, but such constraints

¹ Perry (2021) shows that low levels of institutional trust are also problematic in the developing world, where institutional trust could instead represent an essential asset for democratic consolidations. For instance, in post-colonial regimes in African countries, a decreased level of trust may result in a democratic breakdown and even a return to authoritarianism. Chuah et al. (2020) point to another crucial feature of developing countries that might be relevant for trust, that is the high level of corruption, which induces people to lack trust in public institutions, believing that public resources are being stolen for private gain (see also Mattes and Moreno, 2018).

can open new possibilities: they may enable choices and actions that otherwise would not exist. For these reasons, most contributions in the economic literature have tried to assess the impact of institutions on different aspects of economic development and social progress (Acemoglu et al., 2005, 2006, 2014; Donges et al., 2023).

In this paper, the term institution is more specific and refers to governmental organizations or systems, differently from institutions intended as formal and informal rules that shape political, economic, and social interactions (North, 1991; Hudson, 2006; Spadaro et al., 2020; Perry, 2021). In addition, differently from most of the previous literature, we are conceived with institutions and, more precisely, with institutional trust as an outcome of one or more socio-economic events and not as a generating factor.

Accordingly, we focus on institutional trust, which is defined concerning different types of public institutions (e.g., governments, police authorities, legal systems) and whose origins can be explained through two main approaches: the *institutional performance* approach and the *social trust* approach (see, among others, Kaasa and Andriani, 2022). The latter considers institutional trust as an extension of interpersonal trust and it is interpreted as a positive externality generated by interpersonal relationships (family, friends, etc.). The former approach interprets institutional trust as being the consequence of institutional performances: citizens will express a higher or lower level of trust depending on the evaluation and perception they have about institutions' activities. As it will become clear in the discussion of Hypothesis 1 below, we will follow both approaches to understand the rationale behind the inequality-trust relationship.

The focus on the main determinants of institutional trust has only recently received the deserved attention. Indeed, shedding light on such determinants is the key to understanding the sustainability of the social contract (Sønderskov and Dinesen, 2016). Among the most recent contributions, Kaasa and Andriani (2022) investigate how the cultural context affects the level of confidence that citizens feel with respect to a wide range of institutions and find that individuals tend to trust institutions less in regions with large power distance. This would suggest that more inclusive decision-making processes are necessary to increase civic engagement among citizens. Moreover, they show that individuals have less trust in political parties but tend to have more confidence in the police in regions with higher uncertainty avoidance, revealing that the expected impact on trust could differ for different institutions.

Among the cultural factors possibly affecting confidence in public institutions, Clausen et al. (2011) and Blanco and Ruiz (2013) focus on the role of corruption and crime, respectively. By using an extensive global household survey, the former documents a statistically significant negative correlation between corruption and trust in public institutions, which is also consistent with the results by McAllister (2014) for the Australian case, where perceptions of corruption matter much more than personal experiences of corrupt public officials in shaping confidence in political institutions. When looking at crime, Blanco and Ruiz (2013) find that the perception of it has a negative significant effect on trust in public institutions in Colombia during the 2004–2010 period, thus hindering economic development because distrust in institutions is associated with lower levels of social capital.

On the other hand, one factor expected to increase trust in governments is public sector transparency, as Porumbescu (2017) proved. Specifically, he examines how different tools used to enhance governments' transparency, such as social media and *e-government* websites, relate to citizens' perceptions of government trustworthiness and finds a positive correlation between the two.

When extending the scope of public institutions by considering the judicial system, Roussey and Deffains (2012) investigate the relationship between judicial resources and individuals' trust in justice, finding that the latter increases when the justice budget increases. The intuition is that the justice budget represents a signal when individuals face uncertainty regarding the judicial environment. Interestingly, they also support that democracy does matter in this framework, given that the effect of the justice budget on trust in justice is likely to be more significant when individuals are more satisfied with the level of democracy in their country.²

2.2. How inequality could affect institutional trust

Regardless of the definition of institutions and trust in them, a common ground in the empirical literature concerns the agreement of a relationship between inequality and trust (e.g., Zak and Knack, 2001; Barone and Mocetti, 2016). However, most of the previously mentioned studies rely on cross-sectional data and could suffer from omitted variable biases. Cultural and institutional factors may affect the inequality-trust relationship in a way that cannot be captured by cross-sectional analysis.

Since inequality is seen as a measure of class cleavage, societies in which citizens are less divided by such cleavage are also societies that can count on a higher level of trust. The above discussion is at the base of the research question addressed in this paper.

Different theoretical arguments justify the hypotheses investigated in this paper. First, in more equal societies, individuals develop stronger social ties to each other, creating incentives for trustworthiness and familiarity and engaging in more socially cohesive behaviours. Individuals will also be more prone to respect public rules imposed by governing institutions to fulfil social goals. Hence, through the social trust approach, this strengthens institutional trust as well.

Second, increasing inequality intensifies the feeling of distance; that is, individuals perceive the distance between themselves and others, including the political rulers and governments, to be more significant; this might reduce trust in public institutions.

Third, inequality might act as a signal of exploitation. Trusting public institutions becomes difficult since these are perceived as made by wealthy individuals or by individuals captured by lobbies, which make the interest of the richest part of the societies and seize every opportunity to exploit people in the lower income distribution (Fischer and Torgler, 2006).

Fourth, with high inequality, people might believe that the government needs to be more effective in promoting policies to lessen the uneven market distribution of resources. Accordingly, this would increase the individuals' perception of living in an unjust society,

² Some evidence on the determinants of institutional trust at the supranational level is also provided by Brouwer and Haan (2022) when analyzing whether communication about the ECB policy instruments would affect trust in the ECB.

and, as a reaction, citizens would become more mistrustful of the government in question. In this framework, confidence in the current administration would lack support.

Fifth, because inequality generates negative externalities such as increased crime and social instability, individuals will think these phenomena are due to weak institutions. Thus, they will blame the government for not creating a safer living place, and through the institutional trust approach, this will result in reduced confidence toward ruling institutions. Similarly, high inequality may lead people to disagree on sharing public goods, reducing social ties and cohesion and lowering trust (Delhey and Newton, 2005).

This leads us to the following testable hypothesis.

Hypothesis 1 (H1). Higher economic inequality is associated with lower institutional trust.

Given H1, a natural issue to be considered is how to enhance the level of trust in the presence of high economic disparities within a country. Some theoretical arguments can be made to identify the existence of potential transmission channels. Since inequality might lead to less institutional trust because people experience a greater institutional distance concerning governments and public authorities, increasing transparency in such contacts and relationships would help to reduce the perceived distance induced by inequality.

The digital interaction with the public sector – including online information and services provided to citizens – could work as a tool to shrink such perception of distance because one can act and intervene regardless of her physical location (OECD, 2017; MacLean and Titah, 2022). Specifically, Porumbescu (2017) examines how different tools used to enhance transparency, such as social media and *e-government* websites, relate to citizens' perception of government trustworthiness and finds that respondents' use of public sector social media is positively related to that perception. Additionally, a recent experimental study by Babutsidze et al. (2021) shows the positive effect of digital communication on the emergence of trust in a principal-agent relationship.

As a result of such improvement, the perception of transparency that individuals might have with respect to public institutions and government' actions in the execution of their own role should increase. More importantly, given that such interaction takes place online and that the online procedures are identical across individuals, this could raise the awareness that everyone is treated alike. Ultimately, such awareness might limit the potential negative impact of inequality on trust in institutions.

Given the documented evidence, we test the following hypothesis.

Hypothesis 2 (H2). Digital interaction between citizens and public institutions contributes to improve the trust-inequality relationship.

3. Data and methods

3.1. Main variables

Trust in public institutions is measured at the country level by the percentage of people aged 15 and over resident in the respective country that have command over the language of the questionnaire and that responded "Yes" to the question "Do you tend to trust the national government?". Hence, we follow that part of the literature that uses actors and institutions of government, including the current administration, to proxy institutional trust (e.g., Hudson, 2006; Stevenson and Wolfers, 2011; Hakhverdian and Mayne, 2012). The underlying reason is that institutional trust plays an important role in countries' economic development particularly when the incumbent government is perceived as trustworthy, which usually happens when it is able to enforce the law and assure property rights. These conditions are the main ingredients to promote investments and other economic activities that, in turn, boost growth (Zak and Knack, 2001; Kaasa and Andriani, 2022).

Data on trust in public institutions are collected by the Eurobarometer.³ They consist of approximately 1000 face-to-face interviews per country whose results are published twice a year. We use seventeen waves covering the period spanning from 2003 to 2019 (both included). Since the information on the level of trust is biannual, for each wave and each country we compute the average value taken by the variable in each of the two sub-periods surveys.

Fig. 1 (left axis) reports the level of citizens' institutional trust for all European countries included in our sample and its variation over the observed period (right axis); it shows a high degree of heterogeneity across countries when both absolute levels and changes over the whole period are considered. The country with the highest level of trust in institutions is Luxembourg (a country in which 61.25 % of individuals tend to trust the national government), followed by Finland (57.22 %) and Sweden (52.67 %). Croatia is, instead, the worst-performing country (17.30 %), followed by Italy (21.28 %) and Romania (21.77 %). Although Luxembourg ranks highest in levels, it experiences the worst variation over time (−31.1 percentage points), together with Cyprus (−37.5 percentage points) and Greece (−23.6 percentage points). Interestingly, our data show that, although the levels of trust remain very low, in most countries there have been improvements toward its consolidation.

Economic inequality is measured through the quintile share ratio computed on household equivalent disposable income. It is calculated as the ratio of total income received by the 20 % of the population with the highest income (the top quintile) to that received by the 20 % of the population with the lowest income (the bottom quintile). We focus on income inequality rather than on inequality measured on other economically relevant variables since data on income inequality ensures country and time coverage both adequate for our research purposes. Estimates on inequality by country are provided by Eurostat on the base of EU-SILC, an annual survey aimed

³ It is a series of multi-topic, pan-European surveys conducted for the European Commission starting from 1976, covering attitudes towards European integration, policies, institutions, social conditions, health, culture, the economy, citizenship, security, information technology, the environment, and other topics. Data are not longitudinal at individual level.

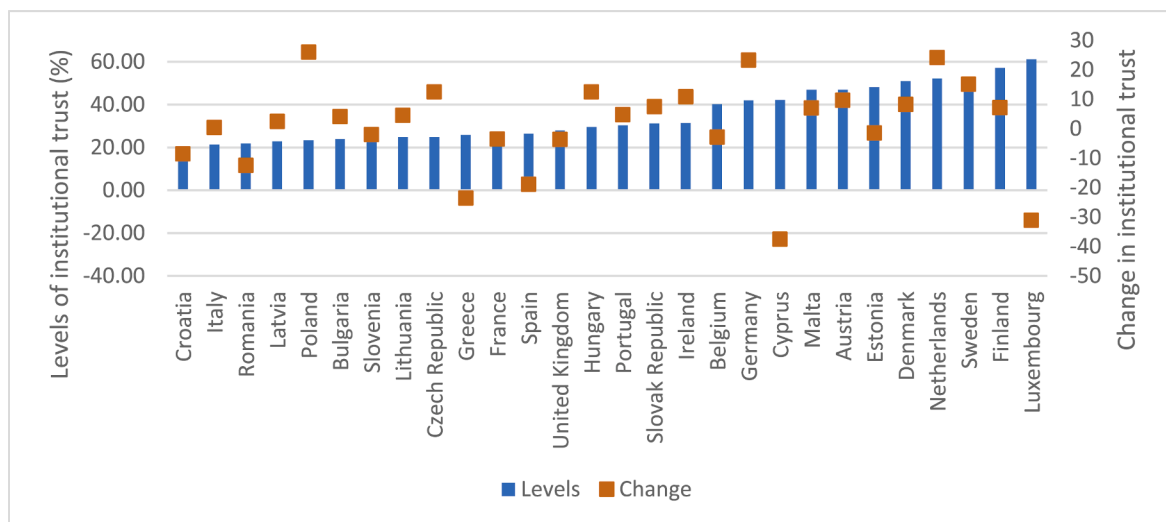


Fig. 1. Institutional trust by country (2003–2019)
 Note: “Levels” refer to the percentage of individuals that, on average between 2003 and 2019, tend to trust institutions (on the left vertical axis); “Change” refers to the difference between the percentage of individuals that tend to trust institutions in years 2003 and the same percentage in year 2019 (on the right vertical axis).
 Source: Own elaborations on Eurobarometer data.

at collecting timely and comparable cross-sectional and longitudinal multidimensional microdata on income and living conditions.

Income inequality and trust in governments show large variations in our sample. In general, countries with a high percentage of citizens that tend to trust the government (green) are also those in which income inequality is low (red). Not surprisingly, this is especially true for Nordic countries as depicted in Fig. 2.

A negative simple correlation between income inequality and institutional trust is found for our sample as reported in Fig. 3, panel (a). Zooming on the evolution of the two variables over time as reported in Fig. 3 panel (b), a quite diverging trend can be noted especially between 2003 and 2012, where income inequality was slowly increasing, whereas trust in governments, after some years of stability, started to decrease consistently. After 2012, both inequality and trust followed an inverted-U shape trend but with a different degree of concavity, which was higher for inequality, meaning that inequality kept increasing but faster than before up to 2017 and then started to reduce slowly, keeping very high levels. This preliminary evidence is rather informative on the joint trend of income inequality and institutional trust; however, to get compelling results we adopt a more robust empirical approach in the next section.

3.2. The baseline model

To test H1, we estimate the following model:

$$ITrust_{i,t} = \alpha + \beta Ineq_{i,t} + \gamma X_{i,t} + \mu_i + \tau_t + \varepsilon_{i,t} \tag{1}$$

where i denotes a country and t indicates the year, with some gaps leading to an unbalanced panel.⁴ $ITrust_{i,t}$ is the dependent variable measuring institutional trust; $Ineq_{i,t}$ is our main independent variable, namely income inequality. Both variables were described in the previous section. $X_{i,t}$ is a set of control variables described below. Finally, both country (μ_i) and time fixed-effects (τ_t) are considered to control for country-specific unobserved factors (e.g., constitutional features) and common shocks (e.g., global crisis); $\varepsilon_{i,t}$ is the error term.

We use the within estimator to exploit variability over time. The inclusion of country-fixed effects, which makes it possible to control for time-invariant observed and unobserved factors, is important since differences in institutional trust across countries may be provoked, for instance, by differences in persistent factors characterizing the country, such as culture and social beliefs, and not by income disparities. Moreover, income inequality and trust show a huge heterogeneity across countries as shown before. Our sample also allows to have a sufficient variability along the longitudinal dimension such that performing a panel analysis with fixed effects proves to be an appropriate choice.

⁴ Country and data coverage (if different from 2003-2019): Austria (2003-2019), Belgium (2003-2019), Bulgaria (2006-2019), Croatia (2010-2019), Cyprus (2005-2019), Czech Republic (2005-2019), Denmark (2003-2019), Estonia (2004-2019), Finland (2004-2019), France (2004-2019), Germany (2003-2019), Greece (2003-2019), Hungary (2005-2019), Ireland (2003-2019), Italy (2004-2019), Latvia (2006-2019), Lithuania (2006-2019), Luxembourg (2003-2019), Malta (2005-2019), Netherland (2005-2019), Poland (2005-2019), Portugal (2004-2019), Romania (2007-2019), Slovak Republic (2005-2019), Slovenia (2006-2019), Spain (2004-2019), Sweden (2004-2019), United Kingdom (2006-2018).

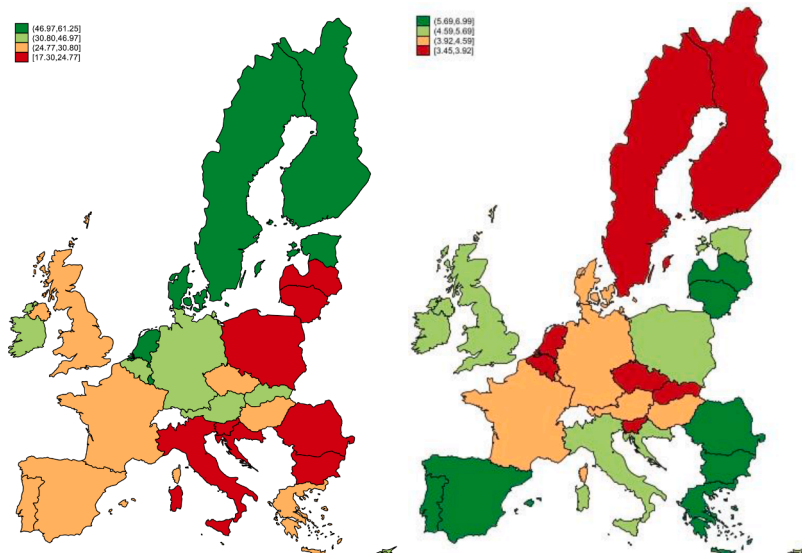


Fig. 2. Institutional trust (left) and income inequality (right) (average, 2003–2019). Source: Own elaborations on Eurobarometer and EU-SILC data.

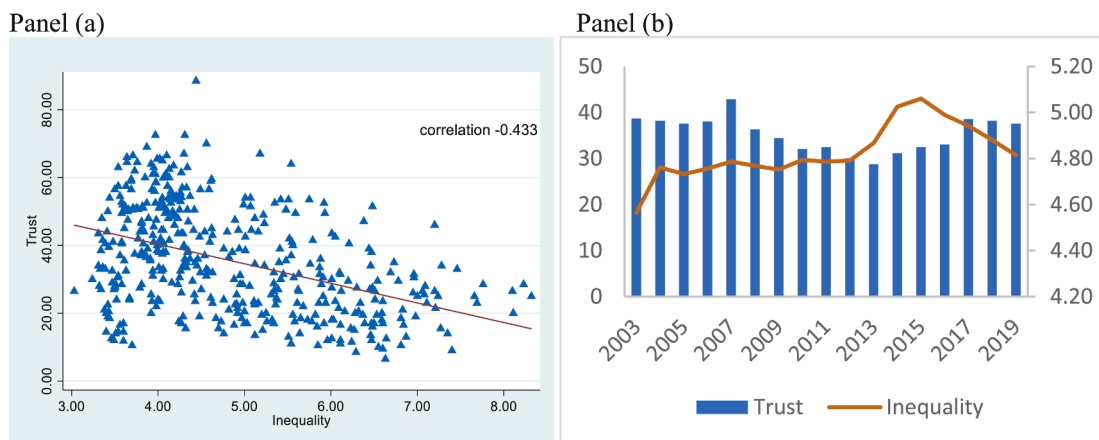


Fig. 3. Correlation between institutional trust and income inequality (2003–2019) Note: Panel (a) plots the trust-inequality correlation for available years and countries in our sample (P-value=0.000). Panel (b) plots the time trend of trust and inequality computed as annual average for the countries of our sample. Source: Own elaborations on Eurobarometer and EU-SILC data.

Given the possible persistence of our dependent variable, the error term is likely to be serially correlated. Accordingly, we also use the fixed-effect estimator with Newey and West corrected standard errors, which assume heteroskedasticity and autocorrelation up to some lags.⁵ Finally, as the NW standard errors are not robust to the presence of cross-sectional correlation that could occur in many regional and macroeconomic panel data as ours (Hoechle, 2007), we complement the analysis using the fixed-effect estimator with the Driscoll and Kraay corrected standard errors, which are robust to heteroschedasticity, autocorrelation, and cross-sectional dependence.⁶

The vector of control variables $X_{i,t}$ has been defined by following the recent empirical literature on the determinants of trust in public institutions as well as of generalized trust (e.g., Stevenson and Wolfers, 2011; Olivera, 2015; Barone and Mocetti, 2016;

⁵ As a benchmark, we use a two-lag correction for autocorrelated errors after observing the residuals' correlation over time. In that case, the correlation starts to become proximate to zero. It should be noted that results are robust to increasing the lag-structure up to 5 lags.

⁶ We implemented the Pesaran CD test that is adequate with unbalanced panels, as in our case, to check for cross-sectional correlation. The test rejected the null hypothesis of spatial independence at any standard level of significance, confirming that the residuals are cross-sectionally correlated in our sample. The results of the test are available upon request.

Ananyev and Guriev, 2019). We include: a variable capturing a country's economic growth measured by the annual growth rate of GDP (*Growth*); the level of education (*Education*) measured by an average of mean years of schooling of adults and expected years of schooling of children; two variables containing demographic characteristics, such as, the age dependency ratio that is the ratio between the number of individuals younger than 15 and older than 64 and the number of working-age individuals (*Dep ratio*), and the share of population living in urban areas (*Urban*); a variable that allows to account for gender representation within institutions, measured by the proportion of seats held by women in national parliaments (*Gender*); a variable capturing the degree of trade openness (*Export*), measuring the values of exported goods and services as a percentage of GDP; a variable catching citizens' participation in selecting their government and exerting some kinds of freedom such as association, expression, media, etc. (*Freedom*); a variable measuring the health status of the labor market (*Employment*), which is proxied by the employment rate.

In line with the recent literature involved in disentangling the relationship between democracy and trust (see, recently, Freitag and Ackermann, 2016; Warren, 2017; Schmidhuber et al., 2021) and given the significant variation in the level of democracy among EU countries as described by the Democracy Index 2022, we also add a control variable capturing the intensity and quality of democracy in each country (*Democracy*). It is proxied by an index measuring the possibility of legally providing initiatives, allowing citizens to contribute directly to the political agenda. Through those forms of direct democracy, individuals' engagement in the collective decision-making process is at its maximum expression. Accordingly, citizens will realize and appreciate such an opportunity being reflected in higher trust in governments and the current administration as captured by our dependent variable.

We also follow that part of the literature suggesting that crime and the immigration phenomenon might influence the perception of inequality and social cohesion among citizens, of generalized trust as well as confidence in public institutions (see, among others, Kesler and Bloemraad, 2010; Blanco and Ruiz, 2013; Van der Linden et al., 2017). Accordingly, we consider a further specification of Eq. (1) that includes among the controls: a variable measuring immigration (*Immigration*), given by the number of refugees per country; a variable controlling for crime (*Crime*), represented by the kidnapping rate. Descriptive statistics and detailed definitions and sources of all variables are reported in Table A1 in the Appendix.⁷

4. Results and mechanisms

4.1. Baseline results

Table 1 reports the main results by estimating Eq. (1) with the three different estimators. We start with a parsimonious model with the variable *Ineq* only (together with country and year fixed effects) in column (1) and then we add all controls – except immigration and crime – in column (2), representing our reference specification. In column (3) we also add immigration and crime.⁸ Columns (4) and (6) follow the same logic when adopting the NW-corrected standard errors, and columns (7) and (9) when adopting the DK-corrected standard errors.

Looking at all specifications, it clearly comes out that income inequality is negatively associated with trust in institutions. This finding is robust and statistically significant across columns. For increasing values of *Ineq*, the level of institutional trust decreases, suggesting that economic inequality reduces the confidence that citizens have in national governments.

Results in Table 1 provide empirical support for H1 described in Section 2, according to which trust in public institutions should decrease with income inequality since people are likely to experience a greater distance from policymakers and public authorities, and to consider such inequality the result of a worse governments' performance. Accordingly, they would judge as unsuccessful, for instance, the redistribution function, which is one of the main tasks of national governments in advanced economies.

Moreover, increasing income inequality puts a strain on governments' ability to maintain their obligations. As a result, the perceived unresponsiveness of institutions to citizens' needs and the concerns about handling the recent economic crisis might have contributed to a decline in trusting them. Many individuals might feel that governments have not helped them to improve their standard of living as in the presence of higher inequality they are likely to be poorer.

As for the control variables, looking at column (2) we observe some regularities across specifications in Table 1. The GDP growth rate (*Growth*) contributes to increasing the extent of institutional trust, possibly because higher economic growth would imply that governments have higher resources to finance public goods and services. The share of the 'dependent population' (*Dep ratio*) does not show any significant coefficient, while the share of the population living in urban areas (*Urban*) is positively associated with higher trust, when statistically significant, primarily because compact, dense urban areas are more likely to promote social interaction and hence increase confidence.

Education exerts a negative and significant impact on trust in governments. There are at least two transmission channels that help

⁷ The relationship under scrutiny could have been investigated using two alternative methods. The first, still following an empirical approach, would have consisted in performing this analysis on individual-level data, instead of country-level data as we do in this paper. However, using individual-level methods would not have allowed us to obtain robust results as data on trust are repeated cross-sectional at the country level. Therefore, we could not have applied panel data methods by using individual observations. Hence, we could not have controlled for unobservable factors by adding fixed effects, as we do in our analysis. The second method would have adopted an experimental approach, which would have not allowed us to obtain general results because of the external validity issue - the main weakness affecting experimental investigations on individual behaviour.

⁸ The inclusion of immigration and crime considerably reduces the sample size. Thus, we keep the two specifications in columns (2) and (3) separated and we opt for column (2) as that containing the results of the reference specification.

Table 1
Baseline results.

	Dependent variable: <i>ITrust</i>								
	Conventional SE			Newey-West corrected SE			Driscoll-Kraay corrected SE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Ineq</i>	-2.531** (1.067)	-2.742*** (1.014)	-2.730** (1.067)	-2.531* (1.406)	-2.742** (1.273)	-2.730** (1.310)	-2.531*** (0.561)	-2.742*** (0.431)	-2.730*** (0.518)
<i>Growth</i>		0.902*** (0.168)	0.718*** (0.171)		0.902*** (0.220)	0.718*** (0.211)		0.902*** (0.239)	0.718*** (0.217)
<i>Dep ratio</i>		-0.0506 (0.269)	-0.518* (0.293)		-0.0506 (0.374)	-0.518 (0.460)		-0.0506 (0.370)	-0.518 (0.470)
<i>Urban</i>		0.755* (0.413)	0.729 (0.471)		0.755 (0.540)	0.729 (0.563)		0.755** (0.272)	0.729** (0.353)
<i>Education</i>		-53.19* (32.12)	-81.53** (36.40)		-53.19 (42.33)	-81.53* (48.74)		-53.19** (20.60)	-81.53* (40.71)
<i>Export</i>		-0.171** (0.0669)	-0.139* (0.0735)		-0.171** (0.0829)	-0.139 (0.0915)		-0.171** (0.0648)	-0.139 (0.104)
<i>Freedom</i>		10.78** (4.847)	21.28*** (5.654)		10.78 (7.920)	21.28** (9.165)		10.78 (6.403)	21.28*** (5.561)
<i>Gender</i>		-0.255** (0.116)	-0.376*** (0.128)		-0.255** (0.125)	-0.376*** (0.139)		-0.255** (0.114)	-0.376*** (0.0929)
<i>Employment</i>		4.305*** (0.961)	-0.892 (1.558)		4.305*** (1.356)	-0.892 (1.717)		4.305*** (1.502)	-0.892 (1.575)
<i>Democracy</i>		8.348*** (2.700)	9.050*** (2.608)		8.348*** (1.445)	9.050*** (1.492)		8.348*** (1.413)	9.050*** (1.021)
<i>Immigration</i>			-0.0756 (0.0710)			-0.0756 (0.0786)			-0.0756 (0.0626)
<i>Crime</i>			-0.281 (0.548)			-0.281 (0.642)			-0.281 (0.355)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N observations	430	430	356	430	430	356	430	430	356
N countries	28	28	25	28	28	25	28	28	25
R-squared	0.177	0.320	0.312				0.177	0.319	0.311
$p > F$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. SE using different estimators are reported in brackets. The constant, country, and year fixed effects are included but their coefficients are not reported in the table.

understand this adverse effect. First, an increase in education levels should increase the citizens' expectations in terms of government performance. More educated people are more aware of what should be the role of institutions that represent their interests and possess more tools to identify potential or existing problems and shortcomings in the public institutions' conduct. Better-educated individuals question political elites and traditional processes of representative democracy (Dalton, 2005) and are immediately able to perceive when the government fails in its mission, which makes these individuals suspicious and distrustful with the ruling class.

But the education-trust nexus may even depend on the level of risk and uncertainty, in fact, trust involves individuals' perception of how uncertain or risky is the situation they are experiencing. This nexus arises to be harmful when corruption or social and political risks become prevalent (Wu, 2021). Where sociopolitical risks are widespread, education raises people's awareness of such risks and lowers their propensity for taking on risks, leading to a negative association. Because the results derive from a sample of countries with very different risk and uncertainty contexts, we claim that the mechanism at work is most likely explained by the education producing more demanding citizens.⁹

Trade openness (*Export*) shows a negative coefficient suggesting that increasing export can be interpreted as an economic strengthening of other (maybe competitor) countries and, hence, as a signal of lower trust in domestic institutions.

The degree of freedom of association and expression (*Freedom*) considerably increases trust in national governments among citizens, in line with previous findings stressing that higher participation and civic engagement foster institutional trust (Kaasa and Andriani, 2022). Related to this outcome, the coefficient on democracy (*Democracy*) is also positive and statistically significant, corroborating evidence of the virtuous relationship between trust in governments and the quality of democracy, as highlighted in the previous section.

Our indicator of gender equity (*Gender*) is adversely related to trust. This might be interpreted as a cultural shortcoming, according to which a large part of the population is still not able to recognize that gender equity is a fundamental value of modern societies. Thus, citizens do not realize that fighting gender inequity should also be encompassed among the main goals of a national government, and

⁹ Another branch of the literature argues that increased education increases institutional trust. For example, more educated individuals will benefit more from political processes, getting better jobs and life chances. Moreover, more educated individuals can play a role in politics and therefore develop more political trust while less educated individuals are alienated (Turper and Aarts, 2017).

the degree of gender inequity could be used as a complementary indicator to evaluate the performance and effectiveness of the government.

As expected, the level of employment has a striking positive correlation with institutional trust highlighting that individuals living in countries characterized by an inclusive and proactive labour market tend to be much more confident in institutions and their policies.

In column (3), we consider the alternative specification of model in column (1) that includes immigration and crime among the controls. Their respective coefficients have the expected sign, but they are not statistically significant at the conventional levels; thus, we cannot conclude that there is a robust association between institutional trust and immigration as well as between institutional trust and crime. The latter results must be, however, interpreted with caution due to ineffective data availability as the sample narrows sizably (i.e. from 430 to 356 observations) and the missing values involve many countries when we try to control for those phenomena within a society.

4.2. Endogeneity issues

Although most of the literature previously described focuses on the relationship from inequality to trust, it could be argued that the decline in social capital, of which trust is a relevant component, can exacerbate existing inequalities for two main reasons. In less trusting societies, there could be a lower sense of sharing a common fate among citizens and a lower social capital; both elements might call for less supportive universal policies, which are more effective in reducing income inequality. The second reason is that there could be a potential effect of trust on inequality via economic growth (Zak and Knack, 2001). However, it should be noted that the inclusion of country fixed effects makes it less likely that the results suffer from omitted variable bias.

For the sake of completeness, we address potential simultaneity and reverse causality issues by applying an instrumental variable two-stage least square (IV-2SLS) approach employing, alternatively, two instruments that have opposite effects of inequality. The first instrument is an indicator of the basic welfare conditions met by the generation preceding the one observed in our sample. As proved by the existing literature, exclusion from markets, services, and spaces experienced by past generations may result in inequalities in the current generation. Inequality in different spheres of the individual life, such as education and health, can result in income inequality. This intersecting nature can cause it to persist and be transmitted from one generation to the other, forming 'inequality traps'.

Operationally, we use the estimates of the *Basic Welfare index* in the 1970s provided by the World Bank and scaled to range from 0 (low) to 1 (high) score. It is a time-invariant and composite indicator based on some basic welfare sub-components, where all indicators reflect the extent to which the population's basic needs are being met.¹⁰ Information about this instrument is available for all countries considered in our analysis.

The IV estimates using the *Basic Welfare index* as an instrument are reported in Table 2, columns (1) and (2), and prove that our main findings are confirmed as the coefficients on *Ineq* are negative and statistically significant across specifications. The first-stage regressions confirm the soundness of the IV estimates: the F-test is always above the threshold of 10, and we reject the hypothesis of weak instruments, as reported at the bottom of Table 2.

Moreover, looking at the Kleibergen-Paap LM p-value, we can also reject the null hypothesis of under-identification at the 1 % significance level. As expected, the instrument is inversely correlated with *Ineq*, as shown by the coefficient on \widehat{Ineq} reported in Table 2, suggesting that when basic needs are met, the intergenerational transmission of income disparities tend to be lower. Using the previous generation's welfare conditions as an instrument would allow to rule out any direct effect of such instruments on the dependent variable, satisfying the exclusion restriction condition.

The second instrument is based on the "skill-biased technological change" hypothesis (Berman et al., 1998; Perera-Tallo, 2017), arguing that advancing technology feeds the demand for skilled workers, who thus have the power to ask for higher wages. This process is reflected in higher wage inequality and, being wages the primary source of individuals' income, ultimately leads to higher income inequality (see, among others, Acemoglu et al., 2005).

Operationally, we rely on Barone and Mocetti (2016), who instrument income inequality with an indicator of exposure to technological change obtained by interacting three sources of variation that are plausibly exogenous with respect to the country trend in trust: the value-added weight of the country in different economic sectors at the beginning of the period; technological coefficients capturing the sectoral dependence on the ICT; the worldwide growth of the ICT industry. The idea underlying this indicator is that before the ICT revolution, different sectors had a technologically different dependence on ICT, so that the ICT outbreak disproportionately hit those countries that had specialized in ICT-dependent sectors. We constructed the instrument using the data retrieved from STAN (the OECD database for structural analysis).¹¹

Estimates reported in Table 2 in columns (3) and (4) confirm that endogeneity and reverse causality issues do not affect our results. Exposure to technological shocks proves to be a powerful instrument, as witnessed by the first-stage regressions: the F-test is above the threshold of 10 in both specifications, the hypothesis of weak instruments is rejected as well as the hypothesis of under-identification. Differently from the previous instrument, exposure to technological change is positively correlated with *Ineq*, corroborating existing

¹⁰ In detail, we have infant mortality rate, life expectancy, kilocalories per person per day, literacy rate and average years of schooling. In addition, two expert-based indicators from V-Dem are included that assess whether everyone in each society has access to basic education and health care.

¹¹ Although it is conceived to be a finer instrument given that it relies on a well-established literature, data required to construct it are not available for all countries of our sample. The list of the countries for which such data are available, in alphabetical order, is: Austria, Belgium, Czech Republic, Estonia, Denmark, Finland, France, Ireland, Italy, Luxembourg, Portugal, Slovak Republic, Spain, Sweden, the United Kingdom.

Table 2
Inequality and trust: instrumental variables.

	Dependent variable: <i>ITrust</i>			
	(1)	(2)	(3)	(4)
<i>Ineq</i>	−11.23*** (1.095)	−8.982** (2.789)	−28.20*** (6.330)	−9.238* (5.541)
Controls	NO	YES	NO	YES
Country FE	NO	NO	NO	YES
Year FE	NO	YES	NO	YES
<i>First-stage instruments</i>				
\widehat{ineq}	−13.488*** (0.949)	−8.459*** (1.615)	0.006*** (0.0013)	0.021*** (0.0055)
N observations	312	312	227	227
N countries	20	20	15	15
<i>F test (first stage)</i>	201.81	27.42	19.37	13.35
<i>KL-Paap LM (p-value)</i>	0.00	0.00	0.00	0.00

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. SE are reported in brackets. The constant is included but not reported in the table. Controls are those used in Table 1, column (2). *Ineq* is instrumented with the *Basic Welfare* during the 70 s in columns (1) and (2) and with an indicator of skill bias technological change in columns (3) and (4).

results in the literature.

Overall, the IV estimates provide further reassurance that the endogeneity issue should not be a severe concern in our case. It is worth noting that it is extremely difficult, if possible, to find an appropriate identification strategy to handle perfectly with endogeneity issues. Therefore, we do not intend to interpret our results as a signal of causation but to further support our evidence. In addition, our baseline results resist a set of robustness checks whose details are reported in Appendix A2.

4.3. The role of digital interaction

In this section, we consider the spread of digitalization in the citizens-institutions relationship and how such interaction might affect the trust-inequality nexus, as stated in H2. We consider the degree of digital interaction between individuals and the public sector (*DI*), measured through the percentage of citizens aged from 16 to 74 that had at least one contact with public authorities via the Internet in the previous 12 months for one of the following activities: obtaining information from institutional websites; accessing and downloading official forms; filling and submitting completed forms.¹²

Fig. 4 reports the diffusion of *DI* for the countries included in our sample and its variation over 2008–2019. Both are highly heterogeneous across countries, especially if compared with institutional trust plotted in Fig. 1: the level of *DI* ranges from about 20 % for Romania to about 80 % for Denmark; nevertheless, it shows an increasing trend almost everywhere (exceptions are Italy and Luxembourg).

To test H2, we introduce the variable *DI* and its interaction with income inequality as follows:

$$ITrust_{i,t} = \alpha + \beta Ineq_{i,t} + \sigma DI_{i,t} + \omega (Ineq_{i,t} * DI_{i,t}) + \gamma X_{i,t} + \mu_i + \tau_t + \varepsilon_{i,t} \quad (2)$$

Given Eq. (2), the overall effect of *Ineq* on *ITrust* is conditional on the level of digital interaction, i.e. $\frac{\partial ITrust}{\partial Ineq} = \hat{\beta} + \hat{\omega} \cdot DI_{i,t}$. H2 is confirmed when $\hat{\omega} > 0$ and the overall effect of inequality on trust decreases as *DI* increases.

Results reported in Table 3 support H2: when statistically significant, the coefficient on the interaction term ($\hat{\omega}$) is positive. More importantly, the marginal effect of *Ineq* on *ITrust* decreases as *DI* increases, as shown at the bottom of Table 3. In fact, for higher values of *DI* (i.e., over the 75th percentile), the impact of income inequality on institutional trust vanishes away; that is, the marginal effect becomes statistically not significant (even though it stays negative).

Two main reasons could explain the mitigating role of digital interaction for the trust-inequality relation. First, by increasing online connections with the public administration and, thus, facilitating the ways of reaching the latter, it is likely to enhance the transparency of public procedures and mechanisms. This would make citizens being (and being felt) treated equally so that inequality is not seen any more as one consequence of poor governmental performance.

Second, increasing digital interaction with the public sector could boost citizens' awareness of what the national government is doing to address specific individuals' needs. Indeed, many people are unaware of the activities and policies their public institutions plan and implement to enhance their well-being. This lack of information can be overcome using new technologies and online tools such that inequality concern becomes less relevant in determining the extent of trust in governments.

¹² Due to data availability, the variable *DI* starts from year 2008 but it is present for all countries of our sample, as provided by Eurostat.

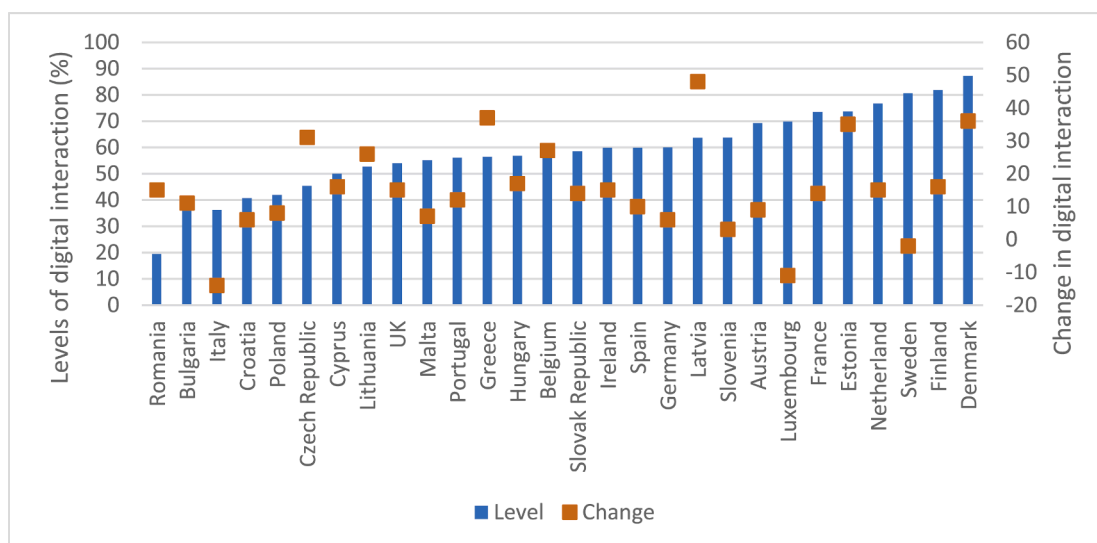


Fig. 4. Digital interaction between citizens and public authorities (average in%, 2008–2019).

Note: “Level” refers to the percentage of citizens aged from 16 to 74 that, on average between 2008 and 2019, had at least one contact with public authorities via internet in the previous 12 months (on the left vertical axis); “Change” refers to the difference between the percentage of individuals aged from 16 to 74 that had at least one contact with public authorities via internet in the previous 12 months in years 2008 and the same percentage in year 2019 (on the right vertical axis).

Source: Own elaborations on Eurostat data.

Table 3

The role of digital interaction between citizens and institutions.

	Dependent variable: <i>ITrust</i>					
	Conventional SE		Newey-West corrected SE		Driscoll-Kraay corrected SE	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Ineq</i>	-4.375*	-5.981***	-4.375*	-5.981***	-4.375***	-5.981***
	(2.278)	(2.240)	(2.577)	(2.240)	(1.563)	(1.650)
<i>DI</i>	-0.137	-0.425*	-0.137	-0.425*	-0.137	-0.425**
	(0.232)	(0.225)	(0.301)	(0.225)	(0.204)	(0.183)
<i>Ineq *DI</i>	0.0252	0.0663*	0.0252	0.0663*	0.0252	0.0663**
	(0.0391)	(0.0378)	(0.0497)	(0.0378)	(0.0305)	(0.0298)
Controls	No	Yes	No	Yes	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N Observations	320	320	320	320	320	320
N countries	27	27	27	27	27	27
R-squared	0.180	0.319			0.180	0.319
<i>p</i> > <i>F</i>	0.000	0.000	0.000	0.000	0.000	0.000
Percentiles	Marginal effects of <i>Ineq</i> for different values of <i>DI</i>					
25 %	-3.468**	-2.734**	-3.468**	-5.053***	-3.468***	-5.053***
	(1.377)	(1.262)	(1.636)	(1.892)	(0.952)	(1.444)
75 %	-2.636*	-1.409	-2.636	-3.595*	-2.636**	-3.596
	(1.534)	(1.471)	(2.158)	(1.513)	(1.270)	(1.337)
90 %	-2.309	-0.548	-2.309	-2.336	-2.309	-2.336
	(1.856)	(1.774)	(2.629)	(1.627)	(1.565)	(1.818)

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. SE using different estimators are reported in brackets. The constant, country FE and year FE, and the same controls used in Table 1, column (2) are included, but their coefficients are not reported in the table.

4.4. The users' profile

Given the result so far, a further issue to be explored is the users' profile and whether it matters for the mitigating effect of the digital interaction in the trust-inequality relationship. Previous research has shown that although access to governmental websites and online resources has increased for all demographic groups, some individuals are more prone, and sometimes more motivated, to consult them than others (OECD, 2017).

Table 4
The digital interaction by education level.

	Dependent variable: <i>ITrust</i>								
	Conventional SE (1)	Newey-West corrected SE (2)	Driscoll-Kraay corrected SE (3)	Conventional SE (4)	Newey-West corrected SE (5)	Driscoll-Kraay corrected SE (6)	Conventional SE (7)	Newey-West corrected SE (8)	Driscoll-Kraay corrected SE (9)
<i>Ineq</i>	−5.414*** (1.575)	−5.414*** (1.686)	−5.414*** (1.228)	−5.229** (2.022)	−5.229*** (1.971)	−5.229*** (1.619)	−4.025 (3.071)	−4.025 (2.973)	−4.025** (1.930)
<i>DI (low-educated)</i>	−0.573*** (0.176)	−0.573*** (0.198)	−0.573*** (0.123)						
<i>Ineq *DI (low-educated)</i>	0.0901*** (0.0324)	0.0901** (0.0355)	0.0901*** (0.0205)						
<i>DI (mid-educated)</i>				−0.393* (0.213)	−0.393 (0.243)	−0.393** (0.152)			
<i>Ineq *DI (mid-educated)</i>				0.0560 (0.0364)	0.0560 (0.0407)	0.0560** (0.0269)			
<i>DI (high-educated)</i>							−0.132 (0.246)	−0.132 (0.261)	−0.132 (0.173)
<i>Ineq *DI (high-educated)</i>							0.0203 (0.0418)	0.0203 (0.0445)	0.0203 (0.0289)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N observations	320	320	320	320	320	320	320	320	320
N countries	27	27	27	27	27	27	27	27	27
R-squared	0.340		0.340	0.320		0.320	0.311		0.310
<i>p</i> > <i>F</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: ****p* < 0.01, ***p* < 0.05, **p* < 0.1. SE using different estimators are reported in brackets. The control variables are those used in Table 1, column (2). The constant, country, and year fixed effects are included, but their coefficients are not reported in the table.

Table 5
The digital interaction by employment status.

	Dependent variable: <i>ITrust</i>								
	<i>Conventional</i>	<i>Newey-West</i>	<i>Driscoll-Kraay</i>	<i>Conventional</i>	<i>Newey-West</i>	<i>Driscoll-Kraay</i>	<i>Conventional</i>	<i>Newey-West</i>	<i>Driscoll-Kraay</i>
	<i>SE</i>	<i>corrected SE</i>	<i>corrected SE</i>	<i>SE</i>	<i>corrected SE</i>	<i>corrected SE</i>	<i>SE</i>	<i>corrected SE</i>	<i>corrected SE</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
<i>Ineq</i>	-5.768** (2.405)	-5.768** (2.492)	-4.007** (1.466)	-5.732*** (1.707)	-5.732*** (1.753)	-5.732*** (1.566)	-5.598*** (1.826)	5.827*** (1.522)	-5.598*** (1.659)
<i>DI (workers)</i>	-5.768** (2.405)	-5.768** (2.492)	-4.007** (1.466)						
<i>Ineq *DI (workers)</i>	-5.768** (2.405)	-5.768** (2.492)	-4.007** (1.466)						
<i>DI (unemployed)</i>				-0.483*** (0.157)	-0.483*** (0.142)	-0.483*** (0.122)			
<i>Ineq *DI (unemployed)</i>				0.0723** (0.0284)	0.0723*** (0.0267)	0.0723*** (0.0218)			
<i>DI (not in the labor force)</i>							-0.478** (0.215)	0.915*** (0.189)	-0.478** (0.175)
<i>Ineq *DI (not in labor force)</i>							0.0739* (0.0378)	-0.147*** (0.0306)	0.0739** (0.0266)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N observations	320	320	320	313	313	313	313	313	313
N countries	27	27	27	27	27	27	3194	3194	3194
R-squared	0.316		0.286	0.336		0.336	0.316		0.315
<i>p > F</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. SE using different estimators are reported in brackets. The control variables are those used in Table 1, column (2). The constant, country, and year fixed effects are included, but their coefficients are not reported in the table.

Moreover, the *e-relationship* between citizens and the public sector might help to reduce the socio-economic differences between different demographic groups. Specifically, having access to a broader set of information, which is made possible through online interaction, can reduce the individual's feeling of distance, and contribute to weakening, for instance, the inequalities due to different levels of education. The same would happen for the disparity due to different levels of income, wages, and salaries.

Accordingly, we consider two characteristics of the users: the educational attainment and the employment status. We resort to the Eurostat database that provides: the percentage of individuals who interacted with a public authority at least once in the past 12 months by the level of education (i.e., low, medium, high); the percentage of individuals that interacted with a public authority at least once in the past 12 months by employment status (i.e., employed, unemployed, not in the labour force). We add those variables in Eq. (2), one at a time, by replacing *DI*, and we include their interaction with *Ineq* in each case. Table 4 displays results for *DI* by the education level and Table 5 for *DI* by the employment status.

As shown in Table 4, digital interaction contributes to shrinking the negative impact of income inequality on institutional trust, especially when such interaction involves more vulnerable categories in society, such as the less educated. In detail, we find that the interaction term between *DI* by education level and *Ineq* is statistically significant only for low-educated people, *DI (low educated)*, in columns (1)-(3). Since low-educated people are often those who bear the burden of economic inequality – usually located on the left-hand side of the earning/income distribution – they tend to express lower confidence in governments.

The chance of exploiting online interaction with the public sector elevates them by providing an instrument of empowerment that can compensate for the low educational attainment and attenuate the inequality burden they suffer. Overall, this would translate into higher trust in public institutions. It should be noted that the marginal effect of *DI (low-educated)* on institutional trust is positive and statistically significant for increasing values of *Ineq*. The same occurs for the variable *DI (mid-educated)*.¹³

Likewise, when looking at Table 5, we note that the interaction term between *DI* by employment status and *Ineq* is highly statistically significant only for unemployed individuals, *DI (unemployed)*, in columns (4)-(6) and barely statistically significant for individuals not belonging to the labour force in columns (7)-(9); both are, in fact, the neediest category in the labour market.¹⁴

Overall, it can be argued that digital connections increase governments' transparency, thus reducing the perceived institutional distance induced by income inequality, mostly experienced by more disadvantaged people, such as the less educated and non-employed individuals.

5. Conclusions

Institutional trust is a pillar of social cohesion as it affects governments' ability to rule and enables them to act without having to resort to coercion, thereby reducing transaction costs and increasing efficiency. As trust in institutions declines, support for democracy does as well. As a matter of fact, declining institutional trust is one of the central problems in modern societies and identifying its determinants, among which inequality, is fundamental for good governance and policy outcomes.

We have shown the existence of a negative relationship between income inequality and trust in national governments for a sample of 28 EU countries over years 2003–2019. Moreover, we have found support for the existence of a channel that could improve the trust-inequality relationship, namely the digital interaction between citizens and the public sector.

Our results pave the road for a set of policy recommendations. First, they indicate that redistribution policies may serve two public functions: one intrinsic and one instrumental. The former coincides with the aim of alleviating inequality. The latter is realized indirectly through the impact of inequality on institutional trust and refers to the additional advantage of boosting trust in governments. A strengthened trust in government could also be reflected into a higher degree of compliance that, in turn, will make redistribution tools even more effective. Those implications do matter especially given the recent Covid-19 pandemic, which is acting by exacerbating existing inequalities and by undermining the power of the educational system as one of the most important boosters of intergenerational mobility and of more equitable societies.

Second, our results point out that the digital interaction with citizens is a potential tool that governments could use to improve trust through a renewed image of transparency on their actions and processes. As a corollary, this allows the voice of citizens for a simpler public sector where public consultations are central elements. In this context, the adoption of public *e-services* can work as a useful proxy for the measurement of public administrations performance and its revealed output quality. The *e-relationship* between citizens and public institutions could complement those policy interventions designed to alleviate socio-economic disparities across individuals. Indeed, as our results suggest, having online access to public services and new forms of digital interactions with public authorities could reduce the institutional distance perceived by the more disadvantaged groups of the society, so alleviating the adverse effect of inequalities on governmental trust.

Third, by following this reasoning, one relevant implication of our study concerns the governments' ability to collect and exchange data electronically given the numerous advantages, including simplification of procedures, reduction of time, administrative burden, and errors with consequent savings. This goes in line, for instance, with the recent *e-cohesion* policy approach promoted by the European Commission, also involving the recent Next Generation EU program.

Finally, our results are encouraging and open room for future lines of research. Two extensions are particularly promising. One concerns the object of the analysis that could be focused on a single society to track the dynamic of both its trust and inequality levels.

¹³ Calculations of the marginal effects from the interaction model are not reported in Table 4 and they are available upon request.

¹⁴ Computing the marginal effects of either *DI (unemployed)* and *DI (not in labour force)* for different values of *Ineq* confirm the positive and statistically significant correlation between those variables and institutional trust when income inequality increases (not reported in Table 5).

The other extension would consist in recognizing that not all observed inequalities should be considered unacceptable and hence compensated, but only that part of inequality that is generated by factors for which individuals cannot be deemed to be responsible.

Declaration of Competing Interest

The authors report there are no competing interests to declare.

Data availability

Data will be made available on request.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jmacro.2023.103582](https://doi.org/10.1016/j.jmacro.2023.103582).

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