# Is rising inequality related to deteriorating trust?

## A panel data approach to the trust-inequality relationship

Sanjin Alagic, Olof Bendz

Supervisor: Andreas Bergh

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LUND
UNIVERSITY

**Abstract**

It is generally agreed upon that social trust is strongly associated with income inequality. However, this conclusion is mainly drawn from cross-country studies, which most likely suffer from endogeneity issues due to unobserved cultural, social and political variables affecting both trust and inequality. In this paper we collect trust data from six different surveys and make them comparable through an interpolation method, resulting in a large dataset covering 94 countries over 4 decades. We then use a panel data model with country-fixed effects, controlling for any time-invariant unobserved factors, as well as time-fixed effects, accounting for common year-specific trends. Thereby we approach the isolated marginal effect of inequality on trust. No general relationship between inequality and trust is found. Next, we investigate if there is a heterogeneity in the marginal effect, conditioned on legal system quality, as well as GDP per capita. Amongst countries with relatively bad legal systems, we find that inequality and trust are negatively associated, whilst there seems to be no relationship in countries with relatively good legal systems.

**keywords**: trust – inequality – panel data

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# 1 Introduction

In recent decades, social trust has increased in popularity in economic research since it has shown to be an extremely important determinant of many desirable economic outcomes. Trust is the general belief that other people are upright, trustworthy and expected to "do the right thing". A working definition by Newton (2007: 343-344) states that trust is "[...] the belief that others will not deliberately or knowingly do us harm, if they can avoid it, and will look after our interests, if this is possible". Trust can therefore be seen as a social norm facilitating mutually beneficial exchanges and agreements in society, and in this way lower transaction costs and improving economic efficiency. Not surprisingly, countries with high social trust seem to, on average, have higher economic growth (Zak and Knack, 2001), better institutional quality (Nannicini et al., 2013; Knack, 2002) and less corruption (Richey, 2010). They also tend to be happier (Bjørnskov, 2003; Helliwell and Wang, 2011), have a larger welfare state (Rothstein and Uslaner, 2005; Barr, 2004) and have less income inequality (Bjørnskov, 2007, 2008; Delhey and Newton, 2005; Nannestad, 2008).

Income inequality is the most robust determinant of trust throughout the literature. Nevertheless, research on the trust-inequality relationship is far from comprehensive. Previous studies have to a large extent engaged in cross-country comparisons (Knack and Keefer, 1997; Zak and Knack, 2001, Bjørnskov, 2007, Leigh, 2006), which are likely to suffer from endogeneity issues because of the plausible existence of omitted variables affecting both inequality and trust, resulting in a spurious correlation between the two. Many attempts of causal inference has been made, with varying results; some claiming that inequality affects trust (Barr, 2004; Uslaner and Rothstein, 2005, Barone and Mocetti, 2016) and other claiming that trust affects inequality (Bergh and Bjørnskov, 2011, 2014). Given these unsettled questions, it is of high interest to turn to the time dimension of trust and inequality. How does trust change over time? Is the potential change dependent on changes in inequality? Surprisingly few studies have investigated this, which could partly be because of restrictions in data. Furthermore, the seemingly wide consensus that trust is stable over time could have been inhibiting further investigation into the cause. However, data on social trust has up to this date been collected for 40 years, and in a majority of the worlds' countries, through various survey organisations. We collect trust data from six different surveys and make the survey scores comparable through an interpolation method. This results in a large dataset with trust scores from 94 countries, spanning over 4 decades. Together with the Standardized World Income Inequal-

ity Database (Solt, 2019) and the World Inequality Database we obtain sufficient data to make the variability of both trust and inequality substantial. Using a panel data model with country-fixed and time-fixed effects, we can investigate the trust-inequality relation while taking into account any time-invariant unobserved factors and common time dependent trends, isolating the effect of inequality on trust.

The paper is organized as follows. Section 2 describes the trust measure. Section 3 presents earlier empirics on the subject. Section 4 provides the theoretical foundation of the trust/inequality-relationship and introduces our main hypothesis. Section 5 describes the data and empirical strategy. Section 6 presents the results and section 7 concludes.

# 2 The trust measure

Firstly, we need to distinguish between the different types of trusts. Our understanding is that, in everyday speech, many tend to think of trust as trust in authorities and institutions. However, the dependent variable in this paper regards the general trust one feels towards other people in society, on whom the trusting part has no information. This is also called generalized or interpersonal trust. It is not to be confused with particular trust, which measures strong bonds between family and friends mostly seen in cultures with a high degree of intergenerational relations (Banfield, 1958). Particular trust does not necessarily correlate with generalized trust. In many cases it is in fact the opposite, as Banfield (1958) shows; that there exist strong bonds of trust between family members, but it does not extend to other families.

Generalized trust is measured by asking a sample of individuals "[g]enerally speaking, would you say that most people can be trusted, or can't you be too careful in dealing with other people?", with the possible answers "yes, most people can be trusted" or "no, you can not be too careful in dealing with other people". The trust score of a country is the proportion answering "yes" to this question. This simple question has been the standard method of measuring trust since the beginning of collecting trust data, and is still the main method in the non-experimental literature. It is proven to be a consistent measure of the underlying theoretical concept of trust, and gains empirical validity through various experiments (Bjørnskov, 2007). For example, it has been shown that the trust score from this kind of question is a

good predictor of how many dropped wallets got returned in different countries, in an experiment done by Knack (2001). Carlin et al (2017) shows that trust scores generated this way correlates with experimental outcomes of so-called trust games across countries, implying that the question 1) indeed measures trustworthy behavior and 2) is perceived approximately the same across countries. Overall, trust research using this method repeatedly finds associations between trust and behaviors that we theoretically expect to be associated with trust. Therefore, this is still the best way of measuring trust.

# 3 Earlier empirics

## 3.1 Trust

Trust varies remarkably between countries. In the Nordic countries, approximately 65% of the population states that most people can be trusted. In Brazil, Colombia and the Phillipines, the score is around 5%. Trust has shown to have strong cultural and political determinants, explaining a large part of the cross-country variation. Bjørnskov (2007) shows that income inequality, the share of Muslims and Catholics (hierarchical religions) in the population and being a former communist society negatively determines trust, while being a monarchy positively determines trust. Richey (2010) finds that corruption negatively determines trust. Some studies also find that Protestantism (Uslaner, 2002) positively determines trust. Common for many of these determinants is that they are highly robust over time, if not completely stable. In other words, there are many time-fixed factors explaining trust levels across countries. There are plenty of studies on the negative association between different types of polarizations and trust. The obvious one is economic polarization in the form of income inequality already mentioned, but there is also some evidence that ethnic and linguistic heterogeneity negatively affects trust (Leigh, 2006; Knack and Keefer, 1997).

Despite the substantial variation between countries, some studies show that trust seems to be stable over time within countries (Bjørnskov, 2007; Uslaner, 2004; Katz and Rotter, 1969). This could partly be because of the responsive character of the norm of trusting others. You trust others because you expect them to be trustworthy, *ex ante*. If the other part has acted trustworthy, *ex post*, your trust in the other will be re-enforced. If, on the other hand, your trust in others do not match the untrustworthy behaviour of the rest of society, your trust would logically

re-calibrate to an equilibrium as you realize that others are not reliable (see e.g Guerra and Zizzo, 2004 or Pelligra, 2010). As a second point with respect to the stability of trust, Uslaner (2004) finds that trust amongst descendants of immigrants in American states correlates with the current trust score of the country of origin, implying that trust is transmitted and sustained across generations. Furthermore, Katz and Rotter (1969) finds that 75% of the variability in adolescents trust scores can be explained by their parents' trust, confirming the stylized fact in psychology that trust is mainly learnt in early childhood (see Dohmen et. al 2008). Bjørnskov (2007) shows this stability empirically by regressing changes in trust on initial trust, and also finds a significant regression-to-mean effect.

## 3.2 Trust and inequality

Any scatter plot of social trust on inequality, at any given year, with a sufficient number of countries, will show a strong negative association between the two (see figure 1). Countries with high social trust tend to have low inequality and countries

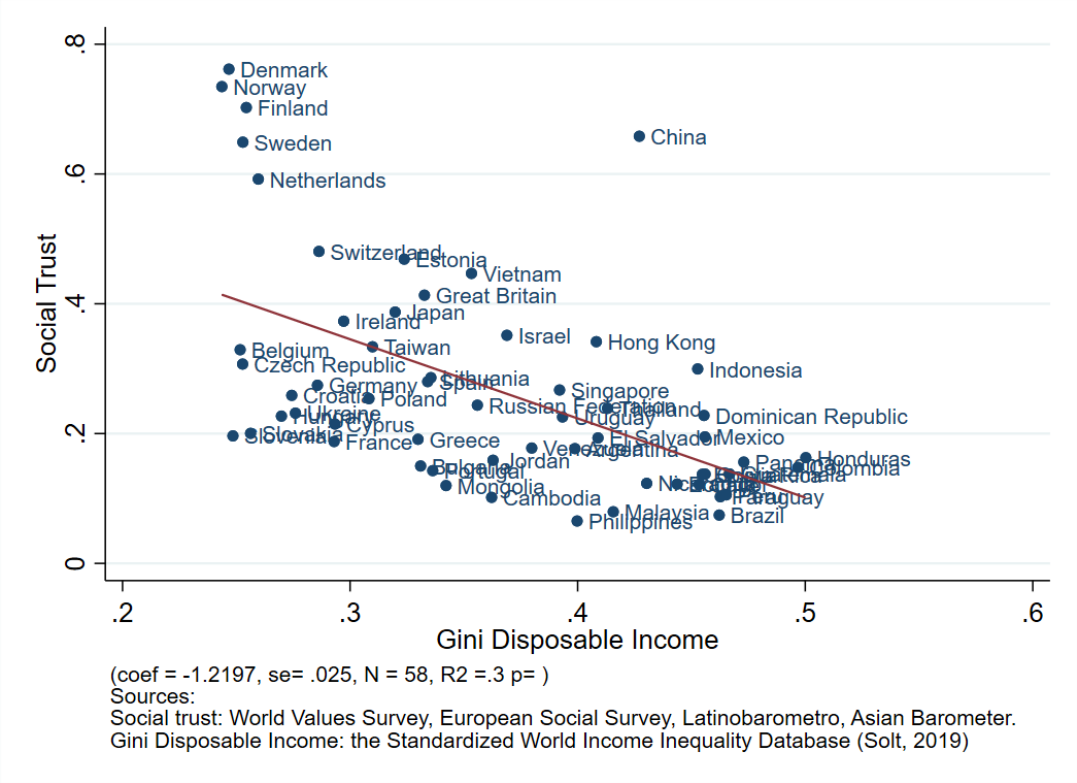


**Figure 1:** Cross country regression in year 2010

with low social trust tend to have high inequality. The correlation remains strong even when controlling for other variables in a multivariate analysis (Zak and Knack, 2001; Bjørnskov, 2007; Delhey and Newton, 2005; Alesina and la Ferrara, 2002).

However, one may suspect the existence of difficultly measurable cultural, political or institutional variables affecting both trust and inequality, making it difficult to isolate the effect of inequality on trust. Thus, endogeneity issues may still prevail in a cross-country analysis because of the somewhat intangible nature of trust. Therefore, the literature has not come to a general conclusion regarding the causal direction between trust and inequality.

The dominant stance, however, seems to be that inequality affects trust - directly or indirectly (Uslaner and Brown, 2005; Bjørnskov, 2007; Delhey and Newton, 2005; Barone and Mocetti, 2016, Graafland and Lous, 2019). Some of the studies of this viewpoint investigate the question through the studying of welfare states, with the particularities of the Nordic countries (high trust and large welfare states) in mind. The implication is that the welfare state increases trust amongst citizens through its redistributional, inequality-reducing policies. This way, equality is mapped with trust through the welfare state as a mediator (Uslaner, 2002; Rothstein and Uslaner, 2005). However, Bergh and Bjørnskov (2011) show that already high trusting people are more likely to build up welfare states, implying the reverse causal direction. Because of the particularly high trust, some countries could avoid free-riding problems notorious for universal access to public goods, and this way construct sustainable universal welfare systems. This evidence is further investigated in Bergh and Bjørnskov (2014) where the authors conclude that trust has a positive effect on equality, but neither the size of the welfare state, nor inequality, has a causal effect on trust. Barone and Mocetti (2016) are the first to our knowledge to use a panel data model when investigating the relation. However, they only use data from the World Values Survey, resulting in a relatively small sample of countries. They find no relationship between inequality and trust when using the entire sample. However, when only examining rich countries they find that Gini for disposable income is negatively associated with trust.

## 3.3 What type of inequality?

There are many measures of inequality. The Gini coefficient is probably the most recurring one in the trust-inequality literature. However, the Gini coefficient only captures certain aspects of inequality. Changes in the income distribution can take place without affecting the Gini score. In other words, multiple income distributions can result in the same Gini coefficient. Gastwirth (2017) shows that the Gini measure is more sensitive to changes in the lower and upper extremes in the distribution, than in the middle. Moreover, the Gini measure can be calculated in many ways;

for example on market income (pre-tax) or disposable income (post-tax). Inequality can also be expressed as the share of total national income belonging to a certain percentile of the population, for example the bottom 50% income share or the top 1% income share. Jordahl and Gustavsson (2008) investigate which measures of inequality are most significant to trust, with data on Swedish nationals. They find a negative relationship between inequality and trust - only when inequality is measured as the disposable income share amongst the bottom 50% of the distribution.

An important note by Nannestad (2008) is that it is probably not the statistical measure of inequality *per se* that affects trust, but rather the aversion against a less egalitarian society. Consequently, one can question if, for instance, the Gini coefficient is a good proxy for egalitarianism. The *process* behind a change in Gini could be even more important for trust than the actual change in Gini. This will be further elaborated in the next section. In summation, to assess whether inequality affects trust or not, one must be careful in which measures of inequality to choose.

# 4 Theoretical foundation of the trust/inequality relation

There is no general theory of the association between trust and inequality. However, we will present four theoretical frameworks that facilitate the understanding of the relationship. The first one regards the homophily principle, the second one is a game theoretic approach, the third one addresses the perception of fairness and the fourth one is the so-called "tunnel effect" formulated by Hirschman and Rothschild (1973).

The homophily principle postulates, in short, that we like people that are similar to ourselves; ethnically, socially, economically etc. (McPherson, Smith-Lovin, and Cook, 2001). In the light of the homophily principle, high inequality becomes a sign of a high degree of divergence in society. The higher the inequality, the less people in society share the same characteristics, affecting the trust one feels towards the average citizen. An illustative example of this is a study by Alesina and La Ferrera (2002) showing that participation in social activities decreases with inequality and ethnic heterogeneity.

Why inequality would affect trust can also be explained through simple game theory. Human interactions can be described as a number of repeated games. A rational

player chooses the option where the expected gain is higher than the expected loss. Incentives to cheat are high in a game which is only played once, but decrease with the amount of times the game is repeated. In an infinitely repeated game, collaboration is beneficial for both players (Pruitt and Kimmel, 1977). Translated to the inequality/trust-framework: incentives to trust the other player (cooperate) increase with the likelihood of meeting that person again. In a society with low inequality, the likelihood of repeated interaction with an individual from a similar socioeconomic background is high since the variance of income is low. On the other hand, imagine a segregated society with high inequality, where individuals from different socioeconomic classes perhaps travel by different means, live in different areas and barely meet. Should two individuals of different socioeconomic status in this society interact, it is of high possibility that they will not interact again, resulting in high incentives to "cheat".

The negative relationship between inequality and trust could also be caused by the unsatisfactory feeling of injustice. Citizens of an unequal society could feel that the well-off has become wealthy through illegitimate and unjust actions, or simply through luck or unfair advantages, hampering trustworthy behavior. However, not all inequality is necessarily unjust. This notion has been put forward by many scholars, maybe most famously by Harvard philosopher Robert Nozick ([1973]2003), who argues that as long as inequality is the result of a just process of voluntary exchanges, it can not be unfair. In the light of this, the quality of legal institutions such as protection of property rights, judicial independence, enforcement of contracts and impartiality - representing the fairness of a society - will determine the size of the effect that inequality has on trust. Inequality will, in other words, not necessarily affect trust negatively, as long as society is perceived as fair. When examining the link between inequality and well-being, Cojocaru (2014) concludes that aversion to inequality does not seem to be intrinsic, but rather related to the perception of fairness in the distributive institutions in society, illustrating the point made here.

The Kuznets curve is a theoretical relationship between inequality and income per capita. It states that as an economy develops, it will in the early stages experience an increase in inequality, but when the economy has matured inequality will start decreasing again (Kuznet, 1955). Based on this, we hypothesize that developing countries, experiencing high growths in income per capita, do not necessarily have a large aversion towards income inequality since it could be a byproduct of something which is seen as positive; increasing living standards. This is also known as

Hirschman's tunnel effect. Hirschman and Rothschild (1973) use the metaphor of a traffic jam when explaining why a population of a developing country would tolerate income inequality. Imagine a traffic jam that has come to a complete stop. If one of the lanes suddenly starts moving, the people in the other lanes will feel gratitude and hopefulness, since they understand that they too will soon be able to move. Thus, the proposition of Hirschman and Rothschild (1973) assumes that the tolerance of increasing inequality is dependent on the anticipation of a consequent fall in the income gap.

In summary, the first and second framework explains why inequality in general would be negatively associated with trust. The third framework illustrates how the fairness of the process behind inequality matters for its potential effect on trust. The fourth framework explains how the development stage of a country could affect the impact of inequality on trust. Based on the reasoning above, we will empirically evaluate the following hypotheses:

**H1:** Inequality and trust are negatively associated.
**H2:** The marginal effect of inequality on trust is less negative, or positive, amongst countries with fair and independent legal systems.
**H3:** The marginal effect of inequality on trust is less negative, or positive, amongst developing countries

# 5 Empirical strategy and data

## 5.1 Data

Our trust measure consists of aggregated individual level data, collected from the World Values Survey (WVS), European Social Survey (ESS), Latinobarometro, Afrobarometer, Asian Barometer and Arab Barometer. The question answered in the surveys was "[g]enerally speaking, would you say that you can trust most people, or that you can never be too careful when dealing with others?", with a few minor - and decidedly neglectable - differences in phrasing. Combined, the surveys cover the time period 1981 - 2018, with unbalanced data.

The main explanatory variable in our dataset is income inequality, for which we used three different measures. The measures used were the standardized Gini-coefficient

for disposable income - from the SWIID[1] database, the bottom 50% share of disposable income - from the WID[2] database and the bottom 50% share of market income - also from WID. It can be worth mentioning that since the WID database is fairly new, the bottom 50% measures had fewer observations.

All the control variables in our dataset were chosen in line with earlier empirical and theoretical findings and are of time-variant nature. We use real GDP per capita - from the Penn World Tables (Feenstra et. al, 2015)[3]; population share of ages 65 and above - from the WDI[4] database; degree of democracy - from the Polity IV Projects[5] database and degree of legal system and property rights - from the Fraser Institute[6].

The integrated dataset consists of 94 countries and 10 time periods ranging from 1975 until 2020 (with intervals of 5 years). The intervals were made by taking five-year averages. This to make the data more balanced (not all variables had observations for the exact same years) and to neutralize business cycles in the economy. Table 1 provides descriptive statistics of the variables used.

**Table 1:** Descriptive Statistics

| Label | Variable | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| Social Trust | trust_c0 | .2572709 | .1665592 | .0256723 | .8297273 |
| Gini (Disposable) | gini_disp | .3733142 | .0941734 | .1793989 | .6636933 |
| Bottom 50% (Disp) Income Share | p0p50d | .2593637 | .0437439 | .17054 | .42328 |
| Bottom 50% (Mkt) Income Share | p0p50 | .1916372 | .0623789 | .054812 | .40606 |
| Legal System | tot | 5.598083 | 1.827761 | 1.41 | 9.28 |
| Degree of Democracy | polity | 4.046056 | 6.602433 | -10 | 10 |
| Log Real GDP per capita | lgdpcap | 9.039967 | 1.076319 | 6.086177 | 11.24275 |
| Ratio of Elderly in Population | elderly | 8.856755 | 5.365019 | 1.886437 | 27.57637 |
| Observations | 939 | | | | |

[1]The Standardized World Income Inequality Database (Solt, 2019)

[2]World Inequality Database (2020)

[3]Penn World Table 9.0. Derived by dividing Expenditure-side real GDP at chained PPPs (in mil. 2011US$) with the population of that same year. (Feenstra et al., 2015)

[4]World Development Indicators (World Bank 2020).

[5]Polity IV Individual Country Regime Trends, obtained at the Center of Systematic Peace (Polity IV, 2020)

[6]Fraser Institute (2020) (Economic Freedom dimension 2).

## 5.2 Variables

Since the trust data was collected from six different surveys, we wanted to investigate if there were any significant measurement differences between the surveys, before integrating them. To test this, we exploited the observations that had trust scores from two different surveys for the same year, i.e overlapping values. WVS was always one of them, since it was the only global survey. After collecting all overlapping values, we regressed the scores from the WVS on the other surveys' respective values to detect whether the beta-coefficient differed from 1 (a beta-coefficient equal to 1 would mean a perfect linear fit, i.e that the survey measures are the same). We found significant systematic differences in overlapping trust scores between the WVS and the other five surveys. Subsequently, to make the trust scores comparable, we used the linear equation from said regression to interpolate the other surveys' scores into the WVS. The reason for a linear fit and not an exponential one, or by taking difference in means, was simply since we found a proportional systematic difference to be more likely than a constant - or exponential one.

Furthermore, to avoid potential negative values of transformed trust measures (only relevant for low observations), we chose to use a linear regression without an intercept. Suitably, when keeping the constant at zero, we got significant regressions ($\beta \neq 1$) between all the surveys, allowing us make an accurate interpolation between every survey. As for a final point of confidence, to make sure there was no bias arising from keeping the constant at zero, we tested our model with all the identical constellations of control variables etc. on the interpolated values by a regular linear regression with a constant as well[7].

As previously mentioned, our three main explanatory variables - Gini of disposable income, bottom 50% share of disposable income and bottom 50% share of market income - are found to be the most relevant measures of inequality in earlier research. The standardized Gini coefficient is constructed by taking an average between 100 different estimations, for every country-year observation. The second and third variable measures the share of disposable, respectively market, income which is obtained by the lower half earners, for a given country. These are both used as running variables in the model, alternating one at each time. One point of detail for these measures is that their effect has opposite signs; a higher Gini means *more* income inequality while a higher bottom 50% means *less* inequality.

[7]See tables 6-9 in the Appendix, under Robustness

Real GDP per capita is used both as a control variable, and as a proxy for a country's development. The variable is derived from the expenditure-side real GDP, expressed in millions of 2011US$, and transformed to natural logarithms. It is primarily used as a running control variable in our model, to control for any potential changes in trust associated with a country becoming richer or poorer - which has shown to be a determinant.

The variable representing the fairness of legal institutions, henceforth named *legal system*, is constructed as an index of judicial independence, impartial courts, protection of property rights, reliability of the police, and a few more. In our model it is used as a running variable that stretches from 1.41 - 9.28, where every increment represents an increase in overall quality of the countries' legal system.

The degree of democracy is built on components and indicators such as; fairness in recruitment of government, transparency of government, limitations of executive power, etc. The index is expressed in two dimensions, where 0-10 represents the degree of institutional democracy, and (-10)-0 represent the degree of autocracy (Polity IV, 2020). In our model it is used as a running variable, indicating that an increase is due to an incremental step closer to full democracy.

## 5.3 Statistical method

As previously mentioned, earlier research on this topic has primarily focused on a cross-country comparison, which implies a premise of trust being stable over time. Furthermore, an analysis of that sort, conducted on a single point in time, can give rise to serious endogeneity problems due to omitted variables. Instead, we turn to a panel data model, which allows trust to vary over time. This approach also allows us to control for country-fixed effects, which accounts for inherent differences between countries which do not vary over time (e.g. geographical, cultural and political differences), reducing potential omitted variables bias. We have showed in section 3 that there, indeed, exists such time invariant factors affecting both trust and inequality. We also account for time-fixed effects, which controls for trends common for all (or most) of the countries over time. This was further ensured by performing a Hausman test, which gave clear indications of such fixed effects being needed. The model is specified as follows:

$$Trust_{i,t} = \alpha + \beta * Inequality_{i,t} + \delta * X_{i,t} + \gamma_i + \nu_t + \epsilon_{i,t} \tag{1}$$

$Trust_{i,t}$ is the level of trust in country $i$ at year $t$. $Inequality_{i,t}$ is the level of inequality (Gini for disposable income, bottom 50% disposable income share or bottom 50% market income share) in country $i$ at year $t$. $X_{i,t}$ is a vector of control variables. $\gamma_i$ is the country-fixed effect. $\nu_t$ is the time-fixed effect. $\epsilon_{i,t}$ is the error term.

# 6 Results

## 6.1 Some initial remarks

The assumption of trust being stable over time, mentioned in the previous section, has in our opinion been used over-confidently. It has largely been a theoretical argument, taking root in thoughts of trust being something that is learned from early age and therefore passed on between generations - or at least kept during the course of a lifetime. However, with our longitudinal dataset, we observed a substantial variation in trust over time, from which we decidedly concluded that this premise does not hold empirically. Figure 2 shows a sample of the countries, illustrating a notable variation between countries and continents, as well as clear within-country variations[8].

[8]This was actually the result of our bachelor thesis, written in 2019. See "Can changes in social trust be explained by inequality?" at LUP Student Papers to get a more detailed review, as well as the additional results of all the countries.

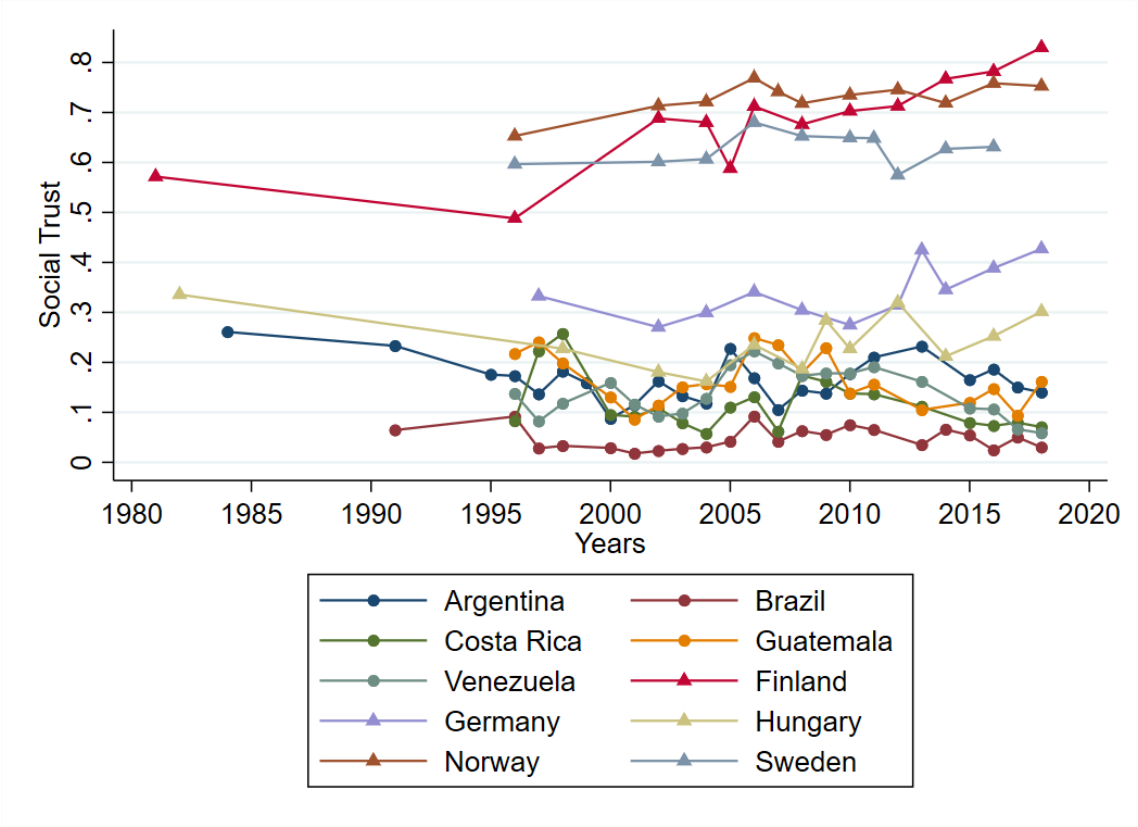


**Figure 2:** Development of Social Trust over time

## 6.2 Main results

Table 2 provides baseline estimates, where trust is regressed on the three measures of inequality separately. Unsurprisingly, there is a strong association when no country-fixed or time-fixed effects has been accounted for. When adding country-fixed effects, the significance disappears in two of the specifications (Gini for disposable income and bottom 50% disposable income share). In the specifications with both country-fixed and time-fixed effects (column 3, 6 and 9), we do not find any significant relationship between trust and inequality, although a weak association ($p<0,10$) of bottom 50% disposable income share on trust.

In table 3 we include covariates and lag the inequality measures, which showed no substantial changes in significance. However, the weak significance of the bottom 50% disposable income share changes from the current period to the previous period. We conclude that we find very little support for our first hypothesis, that inequality and trust are negatively associated. This is an interesting result, since it questions the many earlier studies implying a causal relationship from inequality to trust (Bjørnskov, 2007; Delhey and Newton, 2005; Barone and Mocetti, 2016;

**Table 2:** Baseline Estimates

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Gini (Disposable) | -0.718*** | -0.281 | -0.072 | | | | | | |
| | (0.112) | (0.171) | (0.185) | | | | | | |
| Bottom 50% (Disp) Share | | | | 0.544** | 0.322 | 0.635* | | | |
| | | | | (0.258) | (0.268) | (0.328) | | | |
| Bottom 50% (Mkt) Share | | | | | | | 0.900*** | 0.445** | 0.372 |
| | | | | | | | (0.183) | (0.212) | (0.247) |
| Observations | 379 | 379 | 379 | 130 | 130 | 130 | 226 | 226 | 226 |
| Country Fixed Effects | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Time Fixed Effects | No | No | Yes | No | No | Yes | No | No | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Graafland and Lous, 2019). Our result can be seen as confirming the findings of Bergh and Bjørnskov (2014), who find no causal effect from inequality to trust.

An appropriate discussion at this point is whether we can infer causality from our results. Causal inference is notoriously difficult, especially with non-experimental data. However, a good statistical model together with a robust theoretical foundation can help us a bit on the way. By using a panel data model with fixed effects, together with time-variant covariates, we remove a potentially large source of omitted variables bias - taking us one step closer to estimating the causal effect. A potential problem in many regression designs is simultaneity bias, i.e that the dependent variable both affects - and is affected by - the explanatory variable. In our case, this would mean that trust has an effect on inequality as well. However, such a case would cause an upward bias in the effect of inequality on trust, which means that the true effect would be even smaller than what we find. Therefore, our result that there is no relationship between trust and inequality would still hold. Concluding this paragraph, we do not claim to have found the isolated effect from inequality to trust. However, with our model we have reduced the omitted variable bias, and thus our null effect is closer to the true causal effect than what would have been provided by a cross-sectional analysis.

**Table 3:** Main Results with covariates

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Gini (Disposable) | -0.155 | -0.271 | | | | |
| | (0.191) | (0.304) | | | | |
| Bottom 50% (Disp) Share | | | 0.605* | -0.172 | | |
| | | | (0.332) | (0.424) | | |
| Bottom 50% (Mkt) Share | | | | | 0.365 | -0.018 |
| | | | | | (0.237) | (0.341) |
| L.Gini (Disposable) | | 0.143 | | | | |
| | | (0.307) | | | | |
| L.Bottom 50% (Disp) Share | | | | 0.641* | | |
| | | | | (0.372) | | |
| L.Bottom 50% (Mkt) Share | | | | | | 0.053 |
| | | | | | | (0.283) |
| Log Real GDP per capita | -0.031* | -0.023 | -0.022 | 0.004 | -0.040* | -0.045** |
| | (0.018) | (0.019) | (0.041) | (0.041) | (0.021) | (0.021) |
| Ratio of Elderly in Population | 0.009** | 0.008** | 0.006 | 0.003 | 0.017*** | 0.013** |
| | (0.004) | (0.004) | (0.006) | (0.007) | (0.005) | (0.005) |
| Observations | 370 | 364 | 130 | 128 | 223 | 217 |
| $R^2$ | 0.107 | 0.101 | 0.259 | 0.274 | 0.204 | 0.183 |
| Country Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To test our second and third hypothesis, it was not enough to simply include additional explanatory variables of interest, since it was an *interaction* between said explanatory variables and inequality, we were after. In other words, it is not of our interest to see if legal quality or GDP has an effect on trust itself; but rather the *marginal effect of inequality on trust* - with different degrees of legal quality and GDP. At this point we also chose to include degree of democracy, as it was of our personal interest. It can be mentioned that the degree of democracy has not shown to be of much significance on trust according to earlier empirics - which is why it is not included in out hypotheses.

To investigate the marginal effects we added interaction variables in table 4. Interaction variables are used, in its simplest form, to investigate how an increase in X affects Y depending on the size of Z[9]. In our case, we for example suspect that the marginal effect of inequality (X) on trust (Y) depends on the quality of a country's

[9]see Brambor et. al (2006) for a walkthrough of how to understand interaction variables.

legal system (Z). The algebraic explanation looks as follows. (For simplicity, we leave out control variables, the time-specific and country-fixed effects as well as the error term.)

**Model**:

$$Trust = \alpha + \beta_1 * Inequality + \beta_2 * (Inequality * LegalSystem) \tag{2}$$

If *legal system* = 0:

$$Trust = \alpha + \beta_1 * Inequality + \beta_2 * (Inequality * 0) \tag{3}$$

$$Trust = \alpha + \beta_1 * Inequality \tag{4}$$

If *legal system* = 10:

$$Trust = \alpha + \beta_1 * Inequality + \beta_2 * (Inequality * 10) \tag{5}$$

$$Trust = \alpha + \beta_1 * Inequality + (10\beta_2) * Inequality \tag{6}$$

$$Trust = \alpha + (\beta_1 + 10\beta_2) * Inequality \tag{7}$$

Thus, in a regression table, $\beta_1$ is the effect of inequality on trust if legal system is 0, and ($\beta_1$+10$\beta_2$) is the effect of inequality on trust if legal system is 10. This can be extended to any value of legal system: ($\beta_1$+*Legal System*$\beta_2$). However, as Brambor et. al (2006) explains, in a regression table with interactions like table 4, reading only the coefficients (of inequality or legal system) does not give much information in itself, since they only demonstrate the marginal effect in the specific cases when legal system is 0 respectively when inequality is 0, which is rarely the case. Therefore, to get a more intuitive and illustrative understanding of how the the level of legal system determines the marginal effect of inequality on trust; we constructed margin plots with the conditioning variable (legal system) on the x-axis - and the *marginal effect of inequality on trust* on the y-axis (see figures 3-5).

**Table 4:** Main Results with covariates and interactions

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Gini (Disposable) | 2.649** | -0.045 | 0.006 | | | | | | |
| | (1.152) | (0.347) | (0.188) | | | | | | |
| Bottom 50% (Disp) Share | | | | 6.531** | 3.551** | 0.290 | | | |
| | | | | (3.213) | (1.398) | (0.388) | | | |
| Bottom 50% (Mkt) Share | | | | | | | 1.787 | 0.364 | 0.206 |
| | | | | | | | (2.094) | (0.841) | (0.240) |
| Ratio of Elderly in Population | 0.008** | 0.008** | 0.005 | 0.003 | 0.006 | 0.005 | 0.018*** | 0.018*** | 0.014** |
| | (0.004) | (0.004) | (0.003) | (0.006) | (0.006) | (0.006) | (0.005) | (0.005) | (0.005) |
| Log Real GDP per capita | 0.099* | -0.025 | -0.018 | 0.120 | -0.067 | -0.007 | -0.014 | -0.038 | -0.021 |
| | (0.056) | (0.019) | (0.017) | (0.087) | (0.044) | (0.042) | (0.042) | (0.023) | (0.021) |
| Legal System | | -0.001 | | | 0.160*** | | | 0.013 | |
| | | (0.022) | | | (0.051) | | | (0.025) | |
| Degree of Democracy | | | -0.001 | | | -0.004 | | | -0.007 |
| | | | (0.005) | | | (0.011) | | | (0.005) |
| GDP per cap*Gini | -0.328** | | | | | | | | |
| | (0.133) | | | | | | | | |
| Legal System*Gini | | -0.005 | | | | | | | |
| | | (0.049) | | | | | | | |
| Democracy*Gini | | | -0.018 | | | | | | |
| | | | (0.013) | | | | | | |
| GDP per cap*Bottom50 Disp | | | | -0.619* | | | | | |
| | | | | (0.334) | | | | | |
| Legal System*Bottom50 Disp | | | | | -0.483** | | | | |
| | | | | | (0.189) | | | | |
| Democracy*Bottom50 Disp | | | | | | -0.011 | | | |
| | | | | | | (0.034) | | | |
| GDP per cap*Bottom50 Mkt | | | | | | | -0.156 | | |
| | | | | | | | (0.228) | | |
| Legal System*Bottom50 Mkt | | | | | | | | -0.044 | |
| | | | | | | | | (0.132) | |
| Democracy*Bottom50 Mkt | | | | | | | | | 0.001 |
| | | | | | | | | | (0.021) |
| Observations | 370 | 356 | 365 | 130 | 126 | 130 | 223 | 213 | 222 |
| $R^2$ | 0.126 | 0.103 | 0.166 | 0.287 | 0.396 | 0.313 | 0.207 | 0.207 | 0.239 |
| Country Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Marginal effects conditional on legal system

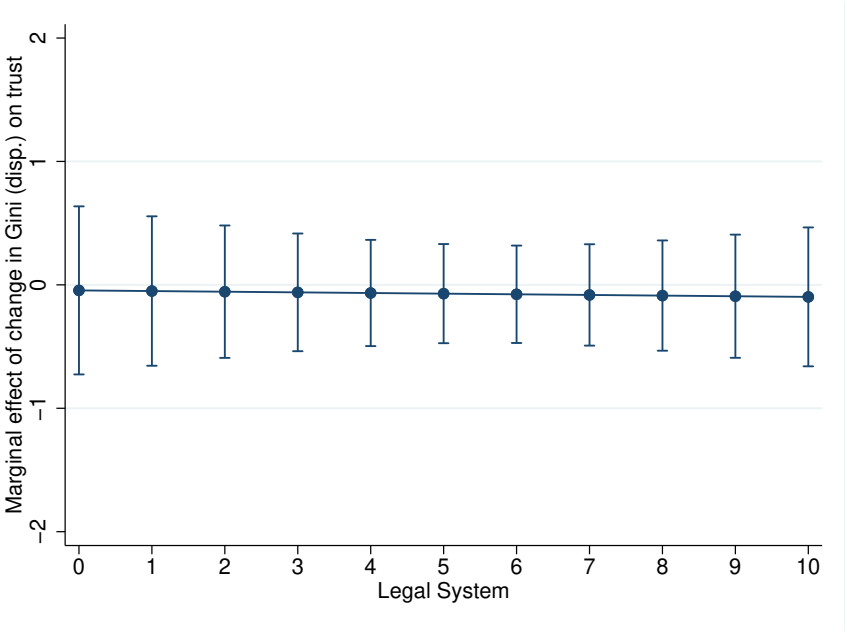


**Figure 3:** The effect of Gini (disposable) on trust given different levels of legal system

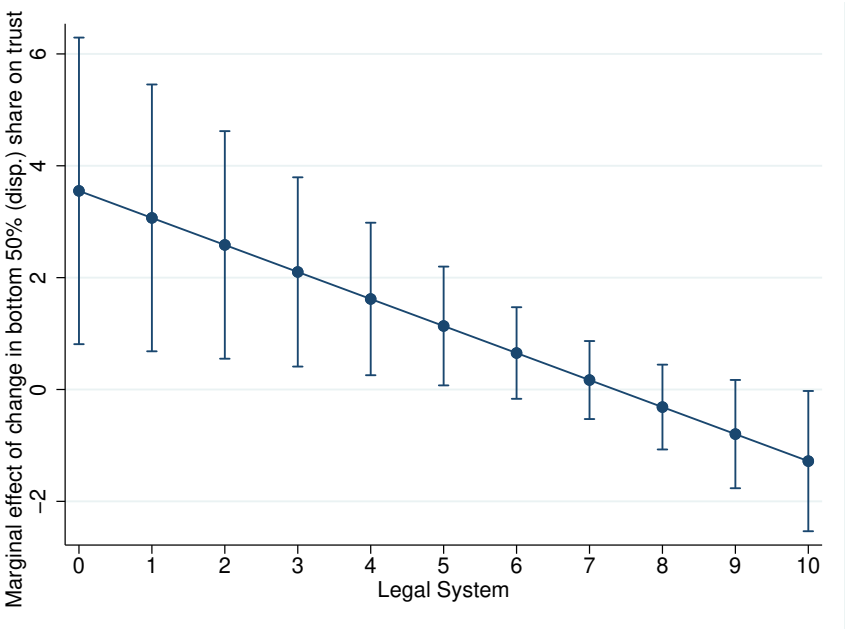


**Figure 4:** The effect of bottom 50% (disp) share on trust given different levels of legal system

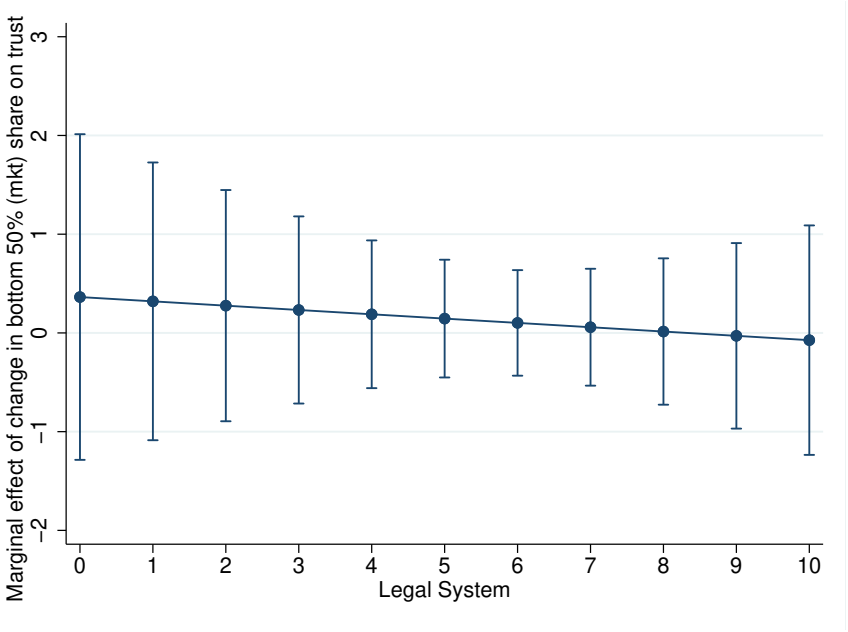


**Figure 5:** The effect of bottom 50% (mkt) share on trust given different levels of legal system

In figure 4 we see that amongst countries with a legal system score less than 5, there is a significant positive relationship between *equality*, measured as bottom 50% disposable income share, and trust, i.e a negative relationship between *inequality* and trust. (Remember that a rise in bottom 50% income share is a *decrease* in inequality, whilst a rise in Gini is an *increase* in inequality). After the threshold of 5, the relationship turns insignificant, although weakly significant when legal system is 10, but with the opposite sign. As we see, the confidence interval becomes quite large at the lower end of the legal system axis. This is because few countries have such low scores on legal system in our dataset, resulting in a large variance. However, this is not a problem since the significance of the effect persist up to legal system = 5 where the confidence intervals are substantially smaller. Accordingly, we find some support for our second hypothesis; in countries with relatively bad legal systems, inequality is negatively associated with trust, whilst the association is insignificant amongst countries with relatively good legal systems. This is, in our opinion, a very important result since it points to the theoretical relationship between perception of fairness and aversion of inequality laid out in section 4. In countries with bad legal system, inequality would negatively affect trust since the judicial institutions can not guarantee a fair process behind the rise of inequality, causing an unsatisfactory feeling of distrust. However, figure 3 and 5 shows that the same heterogeneity does not exist when measuring inequality as Gini (disposable) or bottom 50% (market) income share. The relationship is insignificant no matter the degree of legal quality. Consequently, the second hypothesis is only

supported when using one of the inequality measures, which confirms an implicit point made early in the paper; the *measure* of inequality matters when analyzing the relationship between inequality and trust. A reason for this might be that the relatively poor (bottom 50%) most likely are the disadvantaged in a corrupt country.

Another finding is that for relatively rich countries (log GDP/cap $> 10 \approx$ GDP/cap $>$ USD 22 000), inequality measured as Gini (disposable) seems to be negatively related to trust (see figure 6), confirming Barone and Mocetti's (2016) finding that the relationship between Gini and trust is only significant amongst rich countries. This result is in line with our hypothesizing in regards to the Kuznet curve theory, which states that countries in general will experience a rising inequality during developing stages, but a decreasing inequality when reaching a certain point of economic development. In extension, this would mean that less developed countries (expressed in GDP) experiencing a rise in inequality is doing so as a result of a growing economy, or seeing it as an eventual opportunity of growing - perfectly illustrated by Hirschman's (1973) traffic jam analogy. However, figure 7 shows that the same negative relationship holds in relatively poor countries (log GDP/cap $< 9 \approx$ GDP/cap $<$ USD 8100), when inequality is measured as bottom 50% (disposable) income share. In other words, the effect is opposite depending on which measure of inequality is used, which is an empirical result we do not have any theoretical foundation for, nor can we provide any own reasoning explaining this pattern. As for figure 8, there seems to be no heterogeneity when using bottom 50% (market) income share as inequality measure.

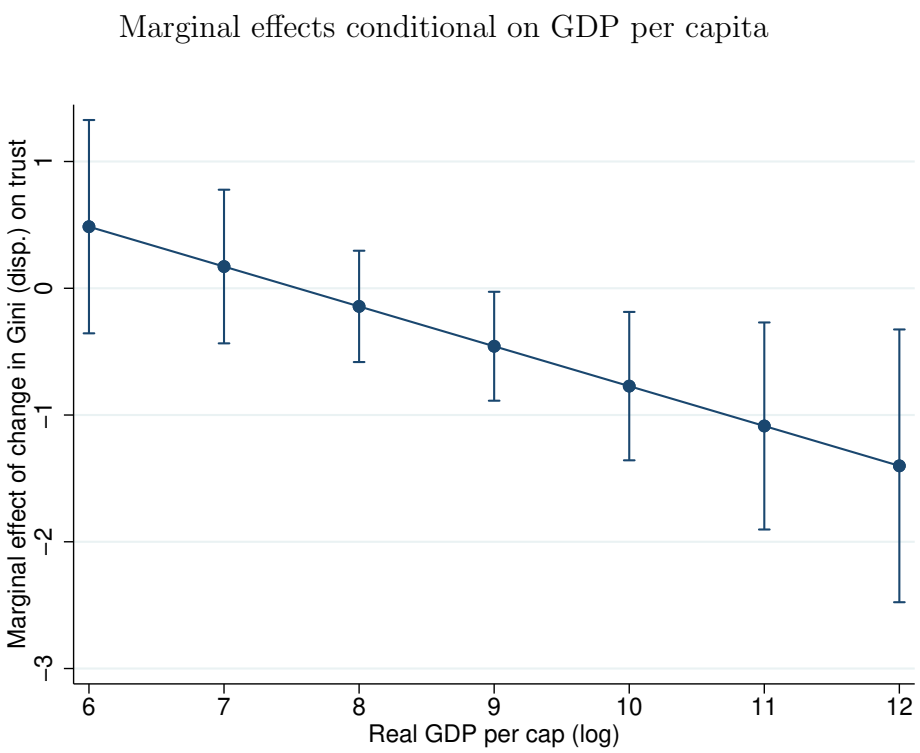


**Figure 6:** The effect of Gini (disposable) on trust given different levels of (log) GDP/cap

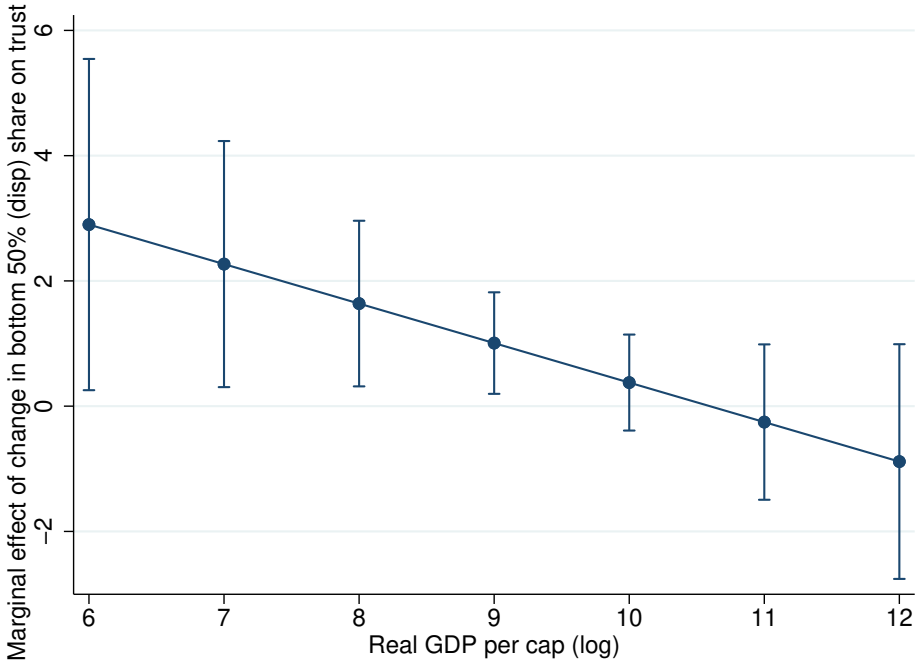


**Figure 7:** The effect of bottom 50% (disposable) share on trust given different levels of (log) GDP/cap

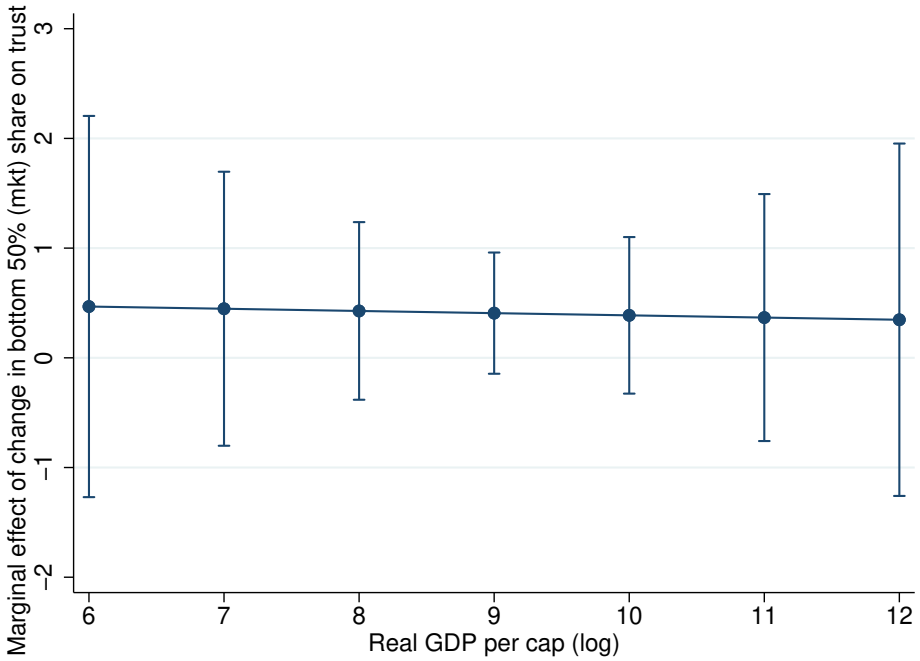


**Figure 8:** The effect of bottom 50% (market) share on trust given different levels of (log) GDP/cap

## 6.3 Lags and robustness

It is reasonable to believe that inequality (and covariates) in period *t-1* has an effect on trust in period *t*. Therefore, we constructed a table with an identical constellation as table 4, but with all the explanatory variables as lagged (see table 5). However, we found that the difference in the results was neglectably small, and did not provide us with any further analysis. Either way, it was reassuring to establish that none of estimates became less significant (only more) with lagged variables; ultimately serving as a robustness check. The only noticeable difference was of the lagged interaction term between *Democracy* and *Bottom 50 (mkt) share*, which turned out significant. However, neither of the coefficients of inequality, nor degree of democracy, is significant; meaning that the confidence intervals in a margins plot covers 0 no matter the degree of democracy, i.e no significant result.

As mentioned in section 5.2, interpolating the trust scores between the surveys was done with a regression *without* a constant. To ensure that this did not cause any biased estimates, we constructed the same tables as in section 6.2 but with trust values interpolated through a regression *with* a constant. As suspected, we got very similar results, with yet again the only change being even more significant coefficients. These tables are provided in appendix (table 6-9).

**Table 5:** Table 4 With Lags

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| L.Gini (Disposable) | 2.677*** | 0.386 | 0.173 | | | | | | |
| | (1.029) | (0.285) | (0.173) | | | | | | |
| L.Bottom 50% (Disp) Share | | | | 9.251*** | 4.253*** | 0.744 | | | |
| | | | | (3.409) | (1.100) | (0.517) | | | |
| L.Bottom 50% (Mkt) Share | | | | | | | 1.757 | 0.965 | -0.011 |
| | | | | | | | (1.904) | (0.767) | (0.240) |
| L.Ratio of Elderly in Population | 0.008** | 0.007* | 0.009*** | 0.001 | 0.002 | 0.008 | 0.011** | 0.005 | 0.016*** |
| | (0.003) | (0.004) | (0.003) | (0.005) | (0.005) | (0.005) | (0.005) | (0.006) | (0.005) |
| L.Log Real GDP per capita | 0.127** | -0.012 | 0.006 | 0.193** | -0.066 | 0.000 | 0.039 | -0.006 | 0.010 |
| | (0.050) | (0.018) | (0.015) | (0.086) | (0.042) | (0.033) | (0.039) | (0.020) | (0.018) |
| L.Legal System | | 0.017 | | | 0.158*** | | | 0.022 | |
| | | (0.017) | | | (0.044) | | | (0.021) | |
| L.Degree of Democracy | | | -0.003 | | | 0.016 | | | 0.003 |
| | | | (0.004) | | | (0.016) | | | (0.006) |
| L.GDP per cap*Gini | -0.301** | | | | | | | | |
| | (0.120) | | | | | | | | |
| L.Legal System*Gini | | -0.041 | | | | | | | |
| | | (0.038) | | | | | | | |
| L.Democracy*Gini | | | -0.006 | | | | | | |
| | | | (0.011) | | | | | | |
| L.GDP per cap*Bottom50 Disp | | | | -0.922** | | | | | |
| | | | | (0.360) | | | | | |
| L.Legal System*Bottom50 Disp | | | | | -0.574*** | | | | |
| | | | | | (0.165) | | | | |
| L.Democracy*Bottom50 Disp | | | | | | -0.087 | | | |
| | | | | | | (0.055) | | | |
| L.GDP per cap*Bottom50 Mkt | | | | | | | -0.198 | | |
| | | | | | | | (0.211) | | |
| L.Legal System*Bottom50 Mkt | | | | | | | | -0.172 | |
| | | | | | | | | (0.115) | |
| L.Democracy*Bottom50 Mkt | | | | | | | | | -0.054** |
| | | | | | | | | | (0.027) |
| Observations | 402 | 378 | 396 | 142 | 134 | 142 | 232 | 214 | 230 |
| $R^2$ | 0.112 | 0.094 | 0.147 | 0.359 | 0.398 | 0.403 | 0.174 | 0.168 | 0.245 |
| Country Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

# 7 Conclusion

One of the most robust determinants of social trust is inequality. The relationship between the two has been investigated diligently in recent years. However, it has primarily been done with cross-sectional data, with the implicit premise of trust being stable over time. Moreover, such studies potentially suffer from endogeneity issues due to unobserved cultural, social and political variables, affecting both inequality and trust.

In this study we have gathered trust data from six different surveys and integrated them by interpolation. Three different measures of inequality were gathered from the Standardized World Income Inequality Database (Solt, 2019) and the World Inequality Database, and additional covariates from various sources. Together, we obtain a large dataset with 94 countries spanning over 45 years. Through a panel data model with country-fixed effects and time-fixed effects we regressed trust on the three measures of inequality separately, with relevant covariates. We found no relationship between inequality and trust, independent of which inequality measure we used. There was a small, but almost insignificant, effect of bottom 50% (disposable) income share on trust.

When including interaction variables and constructing margin plots on the effect of inequality on trust *across different degrees of legal system*, we find that amongst countries with relatively bad legal systems, inequality is negatively associated with trust. However, this result is only valid for one of the three inequality measures, namely bottom 50% (disposable) income share. When conditioning on GDP per capita we find that amongst rich countries, inequality is negatively associated with trust when inequality is measured as Gini (disposable). Amongst poor countries, inequality is negatively related to trust when inequality is measured as bottom 50% (disposable) income share.

In summation, we find that inequality has a heterogeneous effect on social trust, meaning that its effect will depend on the existing conditions of a country - namely ones legal system and GDP per capita. We also confirm that the choice of inequality measure is important for the outcome of an analysis of this kind.

# A Appendix

## Robustness

**Table 6:** Baseline Estimates (Robust)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Gini (Disposable) | -0.783*** | -0.459** | -0.253 | | | | | | |
| | (0.116) | (0.188) | (0.204) | | | | | | |
| Bottom 50% (Disp) Share | | | | 0.612** | 0.371 | 0.681* | | | |
| | | | | (0.277) | (0.289) | (0.357) | | | |
| Bottom 50% (Mkt) Share | | | | | | | 1.030*** | 0.555** | 0.409 |
| | | | | | | | (0.205) | (0.247) | (0.289) |
| Observations | 379 | 379 | 379 | 130 | 130 | 130 | 226 | 226 | 226 |
| Country Fixed Effects | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Time Fixed Effects | No | No | Yes | No | No | Yes | No | No | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

**Table 7:** Main Results with covariates (Robust)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Gini (Disposable) | -0.316 | -0.219 | | | | |
| | (0.210) | (0.338) | | | | |
| Bottom 50% (Disp) Share | | | 0.649* | -0.281 | | |
| | | | (0.362) | (0.457) | | |
| Bottom 50% (Mkt) Share | | | | | 0.405 | 0.009 |
| | | | | | (0.279) | (0.410) |
| L.Gini (Disposable) | | -0.147 | | | | |
| | | (0.341) | | | | |
| L.Bottom 50% (Disp) Share | | | | 0.756* | | |
| | | | | (0.400) | | |
| L.Bottom 50% (Mkt) Share | | | | | | 0.204 |
| | | | | | | (0.340) |
| Log Real GDP per capita | -0.052*** | -0.041** | -0.032 | -0.001 | -0.063** | -0.062** |
| | (0.020) | (0.021) | (0.044) | (0.045) | (0.024) | (0.025) |
| Ratio of Elderly in Population | 0.008** | 0.008** | 0.004 | 0.001 | 0.016** | 0.015** |
| | (0.004) | (0.004) | (0.007) | (0.007) | (0.006) | (0.007) |
| Observations | 370 | 364 | 130 | 128 | 223 | 217 |
| $R^2$ | 0.124 | 0.116 | 0.245 | 0.269 | 0.201 | 0.185 |
| Country Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

**Table 8:** Main Results with covariates and interactions (Robust)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Gini (Disposable) | 2.373* | -0.072 | -0.240 | | | | | | |
| | (1.275) | (0.386) | (0.216) | | | | | | |
| Bottom 50% (Disp) Share | | | | 6.684* | 3.799** | 0.311 | | | |
| | | | | (3.507) | (1.502) | (0.421) | | | |
| Bottom 50% (Mkt) Share | | | | | | | 0.588 | 0.845 | 0.416 |
| | | | | | | | (2.469) | (1.002) | (0.288) |
| Ratio of Elderly in Population | 0.008* | 0.008** | 0.006 | 0.002 | 0.005 | 0.004 | 0.016** | 0.017*** | 0.015** |
| | (0.004) | (0.004) | (0.004) | (0.007) | (0.006) | (0.007) | (0.006) | (0.006) | (0.006) |
| Log Real GDP per capita | 0.073 | -0.049** | -0.041** | 0.113 | -0.085* | -0.016 | -0.060 | -0.058** | -0.050** |
| | (0.062) | (0.021) | (0.020) | (0.094) | (0.047) | (0.045) | (0.050) | (0.027) | (0.025) |
| Legal System | | 0.014 | | | 0.179*** | | | 0.028 | |
| | | (0.025) | | | (0.055) | | | (0.030) | |
| Degree of Democracy | | | -0.007 | | | -0.003 | | | 0.005 |
| | | | (0.006) | | | (0.012) | | | (0.006) |
| GDP per cap*Gini | -0.314** | | | | | | | | |
| | (0.147) | | | | | | | | |
| Legal System*Gini | | -0.031 | | | | | | | |
| | | (0.054) | | | | | | | |
| Democracy*Gini | | | 0.004 | | | | | | |
| | | | (0.015) | | | | | | |
| GDP per cap*Bottom50 Disp | | | | -0.631* | | | | | |
| | | | | (0.365) | | | | | |
| Legal System*Bottom50 Disp | | | | | -0.528** | | | | |
| | | | | | (0.203) | | | | |
| Democracy*Bottom50 Disp | | | | | | -0.016 | | | |
| | | | | | | (0.036) | | | |
| GDP per cap*Bottom50 Mkt | | | | | | | -0.020 | | |
| | | | | | | | (0.269) | | |
| Legal System*Bottom50 Mkt | | | | | | | | -0.120 | |
| | | | | | | | | (0.157) | |
| Democracy*Bottom50 Mkt | | | | | | | | | -0.044* |
| | | | | | | | | | (0.025) |
| Observations | 370 | 356 | 365 | 130 | 126 | 130 | 223 | 213 | 222 |
| $R^2$ | 0.138 | 0.119 | 0.145 | 0.270 | 0.400 | 0.304 | 0.201 | 0.208 | 0.217 |
| Country Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

**Table 9:** Table 4 With Lags (Robust)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| L.Gini (Disposable) | 1.827 | 0.251 | -0.104 | | | | | | |
| | (1.146) | (0.315) | (0.197) | | | | | | |
| L.Bottom 50% (Disp) Share | | | | 9.768** | 4.700*** | 0.801 | | | |
| | | | | (3.720) | (1.205) | (0.563) | | | |
| L.Bottom 50% (Mkt) Share | | | | | | | 2.867 | 1.186 | 0.264 |
| | | | | | | | (2.286) | (0.939) | (0.292) |
| L.Ratio of Elderly in Population | 0.008** | 0.006 | 0.009** | -0.001 | 0.001 | 0.007 | 0.012** | 0.006 | 0.018*** |
| | (0.004) | (0.004) | (0.004) | (0.005) | (0.006) | (0.006) | (0.006) | (0.007) | (0.006) |
| L.Log Real GDP per capita | 0.093* | -0.012 | 0.003 | 0.199** | -0.077* | -0.003 | 0.048 | -0.011 | 0.005 |
| | (0.056) | (0.019) | (0.017) | (0.094) | (0.046) | (0.036) | (0.047) | (0.025) | (0.022) |
| L.Legal System | | 0.026 | | | 0.177*** | | | 0.018 | |
| | | (0.019) | | | (0.048) | | | (0.026) | |
| L.Degree of Democracy | | | -0.010** | | | 0.016 | | | 0.007 |
| | | | (0.005) | | | (0.017) | | | (0.007) |
| L.GDP per cap*Gini | -0.231* | | | | | | | | |
| | (0.134) | | | | | | | | |
| L.Legal System*Gini | | -0.060 | | | | | | | |
| | | (0.042) | | | | | | | |
| L.Democracy*Gini | | | 0.013 | | | | | | |
| | | | (0.012) | | | | | | |
| L.GDP per cap*Bottom50 Disp | | | | -0.969** | | | | | |
| | | | | (0.393) | | | | | |
| L.Legal System*Bottom50 Disp | | | | | -0.635*** | | | | |
| | | | | | (0.181) | | | | |
| L.Democracy*Bottom50 Disp | | | | | | -0.090 | | | |
| | | | | | | (0.060) | | | |
| L.GDP per cap*Bottom50 Mkt | | | | | | | -0.297 | | |
| | | | | | | | (0.253) | | |
| L.Legal System*Bottom50 Mkt | | | | | | | | -0.164 | |
| | | | | | | | | (0.141) | |
| L.Democracy*Bottom50 Mkt | | | | | | | | | -0.078** |
| | | | | | | | | | (0.033) |
| Observations | 402 | 378 | 396 | 142 | 134 | 142 | 232 | 214 | 230 |
| $R^2$ | 0.097 | 0.089 | 0.125 | 0.339 | 0.396 | 0.387 | 0.160 | 0.161 | 0.226 |
| Country Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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