

IFN Working Paper No. 715, 2007

# **Inequality and Trust**

Henrik Jordahl

# Inequality and Trust<sup>\*</sup>

Henrik Jordahl<sup>#</sup>

**Abstract.** This paper reviews the literature on economic inequality and trust. Cross-country studies, within-country studies, and experiments all suggest that economic inequality exerts a negative influence on trust. Four mechanisms are proposed to explain the negative relationship: social ties (or networks), inference on social relationships (to see inequality as a signal of untrustworthy behavior), conflicts over resources, and opportunity cost of time. Social ties receive the strongest empirical support, but there is also some evidence in favor of inference on social relationships. Conflicts over resources and opportunity cost of time are contradicted by important pieces of evidence.

**Keywords.** Trust; inequality; social capital; social ties; networks

**JEL codes.** C23; D31; Z13

---

<sup>\*</sup> I wish to thank Niclas Berggren, Andreas Bergh, Christian Bjørnskov, Justina Fischer and Daniel Waldenström for valuable comments and suggestions.

<sup>#</sup> Research Institute of Industrial Economics (IFN), Stockholm. henrik.jordahl@ifn.se

## 1. Introduction

Inequality seems to be a strong determinant of trust.<sup>1</sup> People in unequal societies trust each other to a much smaller extent than people do in more equal communities. Several economic and social mechanisms could explain this relationship. Political factors could also be important; political arguments and decisions are often influenced by notions of distributive justice. People's aversion to inequality has also been demonstrated in more systematic studies, for example by Fehr and Schmidt (1999).

The development of income inequality and trust in the US illustrates the negative relationship. Since about 1975 there has been a significant increase in income inequality (Piketty and Saez, 2003), and as observed by Putnam (2000) trust has declined during the same period. The coincidence of high trust and low income inequality in the Nordic countries provides an alternative illustration.

There are good reasons to care about this. A major economic advantage of trust is that transaction costs – especially costs of policing and enforcement – are reduced when buyers and sellers can seal an agreement with a handshake. Additional benefits enjoyed in trusting societies have been demonstrated time and again, see e.g. the chapters in a forthcoming handbook from Edward Elgar (Svendsen and Svendsen, 2008).

This paper's review of the literature on inequality and trust concentrates on economic inequality, which belongs to the category of inequality of outcome (or welfare) and excludes inequality of opportunity (which disregards inequalities that are due to differences in effort). In the empirical parts of the paper, the definition of inequality is even narrower. Probably since it is relatively simple to define and measure, annual income inequality has received most of the empirical attention. While the literature thus defined is quite small, it is also a growing literature

---

<sup>1</sup> This paper deals with trust and not with other conceptualizations and measures of social capital. Costa and Kahn (2003) and Coffè and Geys (2006) relate inequality to social capital in a broader sense. Alesina and La Ferrara (2000) relate inequality to participation in associational activities.

with plenty of room for contributions in the future.

The weight of the evidence suggests that economic inequality reduces trust. Of the causal mechanisms proposed in the paper, social ties appear to be more important than inference on social relationships, conflicts over resources or opportunity cost of time, but none of the mechanisms go hand in glove with all of the empirical findings.

The rest of the paper proceeds as follows. Section 2 presents the four proposed links from inequality to trust in more detail. Section 3 discusses different measures of economic inequality. Sections 4–7 present the empirical findings under the headings Trust across countries, Individual trust across local communities, Causal issues, and Experimental evidence. Some concluding remarks in Section 8 close the paper.

## **2. The links from economic inequality to trust**

Trust is fundamentally an actual or potential relation between two persons: one person (the truster) who trusts another person (the trustee) to cooperate rather than to cheat. Trust can be seen as continuous either by varying the value that the truster is willing to put at stake, or by varying the amount of resources that the truster is willing to invest to prevent the trustee from cheating.

The literature contains several suggestions of causal mechanisms through which economic inequality could influence trust. Some of the mechanisms are more precisely stated than others, but most, if not all, of them point to a negative influence. Most mechanisms belong to what Hardin (2006) calls the encapsulated interest conception of trust. Trust is seen as the expectation of cooperative behavior derived from the truster's knowledge of the incentive structure facing the trustee.<sup>2</sup> Even though the trustworthiness of a stranger will often be highly uncertain, it is likely

---

<sup>2</sup> Yamagishi and Yamagishi (1994, p 132) refer to this as “assurance”. Other common conceptions of trust explain it as a moral commitment or as a disposition of character (Hardin 2006, p 25). A problem with these two conceptions is that it is not easily understood how economic inequality affects normative or psychological predispositions to trust and to be trustworthy. If such predispositions are genetic, they would

that some information about his position in the income distribution is available, which together with the truster's own position can be used to infer how large a reasonable baseline level of trust might be.<sup>3</sup> This section presents the proposed mechanisms in four groups: social ties, inference on social relationships, conflicts over resources and opportunity cost of time.

First, social ties probably make people more willing to trust those who are similar to themselves, including in terms of income and wealth. The propensity to put more trust in someone who is closer socially has been suggested by Coleman (1990) and Fukuyama (1995). Hardin's (2006, p 39) broad explanation is that familiarity normally is connected with social ties between the truster and the trustee. Social ties create incentives for trustworthiness and familiarity provides knowledge about this. If it is likely that two persons who belong to the same socio-economic group – and therefore have social ties to each other – will meet again, trust can be built on the expected value of forthcoming cooperative encounters. For similar reasons, much harm will be done to a person's reputation should he cheat someone to whom he is tied socially. In more unequal communities, enforcing sanctions and upholding social control may be more problematic.<sup>4</sup> Coffé and Geys (2006) argue that inequality makes individuals from different socio-economic groups less likely to have values and norms in common.

Second, inference on social relationships may matter to trust. Some people – e.g. those who are influenced by Karl Marx – will see economic inequality as a signal of exploitation, i.e. of untrustworthy behavior. Persons holding this belief will find it natural to reduce their trust in the

---

probably not vary with the distribution of income. While it is also true that the rationalistic and instrumental conception of trust advocated by Hardin (2006) – and used by many economists – has been criticized for lack of relevance (Ostrom, 1998; Rothstein, 2005), its application in the area of economic inequality does not rule out different conceptual explanations of trust in other areas.

<sup>3</sup> Berggren and Jordahl (2006) provide some discussion about how people extend (market-induced) trust in their trading partners to people in general.

<sup>4</sup> The focus is here on reputation and informal sanctions. It is conceivable that formal sanctions in the form of legal punishment are easier to uphold in unequal societies where an upper-level citizen “does not bear the sword for nothing”.

face of rising inequality. By this logic, it should become particularly difficult to trust people at the top of the income distribution, but the trust reduction could also apply to people in general if income differences are thought to reveal that people seize every opportunity of exploiting others.

In a related argument Fischer and Torgler (2006) propose that envy and positional concerns have a negative effect on perceptions of others' fairness. People who feel disadvantaged by their relative income position may come to distrust the reference group of "the Joneses" and extend this distrust to other people. This prediction puts additional focus on the relative income of the trustor but downplays the position of the trustee.

Third, economic inequality creates conflicts over resources. According to this line of argument, inequality magnifies economic incentives for deceitful behavior directed against the rich, especially for poor people. If inequality makes people with fewer resources less trustworthy, it will make people with more resources less inclined to trust them. Note however that this explanation, based as it is on quite simplified incentive structures, implies that the poorest person is more willing to trust everybody else the more unequal is the distribution of income. If income differences are large, richer people have little to gain from cheating a poor person. The net effect of inequality is generally considered to reduce trust, but this is in the end an empirical matter.

In addition, there is a political dimension to conflicts over resources which could undermine trust. Income differences may give rise to a struggle over governmental resources, including over public goods and how they are financed (Boix and Posner, 1998; Coffé and Geys, 2006).<sup>5</sup> Rothstein and Uslaner (2005, p 46) argue that people in unequal societies lack a sense of solidarity in the form of a "shared fate". Society is seen as a zero-sum game between conflicting groups and this is reflected in lower levels of trust.<sup>6</sup> Here inequality makes both the poor and the

---

<sup>5</sup> Both of these studies actually work with broader concepts of social capital rather than with trust, but the described explanation could be relevant for trust too.

<sup>6</sup> Rothstein and Uslaner (2005) also stress inequality of opportunity in addition to income inequality. Compared with income, opportunities are harder to capture empirically. Therefore Rothstein and Uslaner

rich less willing to trust each other.

Fourth, the opportunity cost of time could provide a link from income inequality to trust. A change in income inequality will be accompanied by a change in the aggregate level of trust if each person's trust is sensitive to changes in his income (unless the individual effects even out). For someone who earns a lot of money, working and trusting is more attractive than spending time verifying that others are trustworthy.

Zak and Knack (2001) derive the proposition that an increase in wage inequality that keeps the mean wage constant will reduce trust. When their wages fall, people with low wages respond by reducing their trust in others. A lower wage means that taking the time to ensure that others are trustworthy becomes more attractive than working and trusting. At the other end of the wage distribution, higher wages lead to more trust in others. The net wage effect follows from the supposition that a person is more sensitive to a wage change the lower his wages is.<sup>7</sup> It is worth noting that this mechanism will not show up as an effect of inequality in empirical studies where individual wages are controlled for.

### **3. Measures of economic inequality**

Empirical studies of economic inequality typically focus on inequality of annual income. In the best of worlds this would not be so. Lifetime consumption is arguably more important than yearly earnings. Consumption is less variable than annual income since people tend to adjust their savings over the life cycle and save a relatively large fraction of temporary increases in their income. However, since data on lifetime income and consumption often fall short on quality and

---

do not investigate equality of opportunity as such, but focus on the universality of welfare state programs, arguing that discretionary – and sometimes arbitrary – decisions in selective welfare programs reduce trust.

<sup>7</sup> A similar explanation could follow from Rothstein's (2005) claim that the possession of economic resources makes it easier to handle occasional acts of fraud and deceit. If poor people, through this mechanism, are more afraid to lose some of their wealth, the net effect of a mean preserving spread in wealth will be a reduction of trust.

consistency, many studies use annual income despite its lesser relevance. Another shortcoming is that provision of public goods, which reduces consumption inequality, is normally omitted. To make inequality measures based on permanent income and life time consumption (including public goods) available would be a substantial contribution to a more encompassing literature than the one reviewed in this paper.

The Gini coefficient is by far the most popular measure of inequality. Almost all studies of inequality and trust use it exclusively. In cross-country studies, where availability, comparability and quality of data are often an issue, this exclusive use of the Gini is expected and acceptable. Studies within a given country are different in that they have better possibilities of working also with other measures of inequality. The choice of inequality measures should preferably be guided by the proposed social mechanisms in the hypotheses being tested. Table 1 briefly describes some measures of income inequality with focus on different parts of the income distribution.



**Table 1.** Measures of income inequality

| Inequality measure         | Description                                                                                                                                                           | Comment                                                                                                                                                         |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gini coefficient           | The ratio of the mean absolute difference between all income pairs to twice the mean income. This gives a coefficient between zero and one.                           | Captures inequality in the whole income distribution. Sensitive to differences about the middle (more precisely the mode) of the distribution.                  |
| Percentile ratios          | Ratios of incomes at different percentiles of the income distribution, e.g. income at the 50 <sup>th</sup> percentile over income at the 10 <sup>th</sup> percentile. | Captures inequality in a certain part of the income distribution. Not sensitive to extreme values unless percentiles at the tails of the distribution are used. |
| Top income shares          | Share of income earned by the top x percent.                                                                                                                          | Captures inequality in the form of concentration of income at the very top of the distribution.                                                                 |
| Standard deviation of logs | The standard deviation of the logarithm of income.                                                                                                                    | Captures inequality in the whole income distribution. Sensitive to changes at the tails of the distribution.                                                    |

Table 1 makes clear that there are different measures of income inequality and although the frequently used Gini coefficient incorporates inequality in the entire distribution of income, other measures may be more informative of why inequality matters for trust. The existence of a small group of people with very high incomes is very different from a situation with a wide gap between the poor and the middle class. Different measures of inequality will capture different mechanisms through which inequality may influence trust.

Although in theory a measure of inequality corresponds to a well-defined economic variable, the empirical studies are often characterized by less clarity. The cross-country studies of

inequality and trust often use inequality measures from “secondary” data sets – the one assembled at the World Bank by Deininger and Squire (1996) has been particularly popular – without giving any information about the comparability of different observations. This practice neglects several of the problems that arise when using compilations of inequality data from a variety of sources. What is the reference unit: the household or the individual? Is it income or expenditure that is being measured? If it is income, is it gross or net of taxes? Atkinson and Brandolini (2001) discuss these and several related pitfalls in their excellent survey on the use of secondary data sets in studies of income inequality.

#### **4. Trust across countries**

There is by now a large number of cross-country studies that investigate the relationship between income inequality and trust. The four waves of the World Values Survey have made this line of research possible by providing a simple and internationally comparable measure of the average level of trust for a growing sample of countries. Virtually all of these studies use the Gini coefficient as their inequality measure and the share of a country’s population who say that most people can be trusted as their trust measure.<sup>8</sup>

Although cross country studies are oftentimes considered problematic when it comes to causal inference, an attractive feature when studying trust is that there is a lot of variation between countries. In the latest, fourth wave of the World Values Survey the share of trusting people ranges between 3 percent in Brazil and 67 percent in Denmark. Economic inequality varies almost as widely.

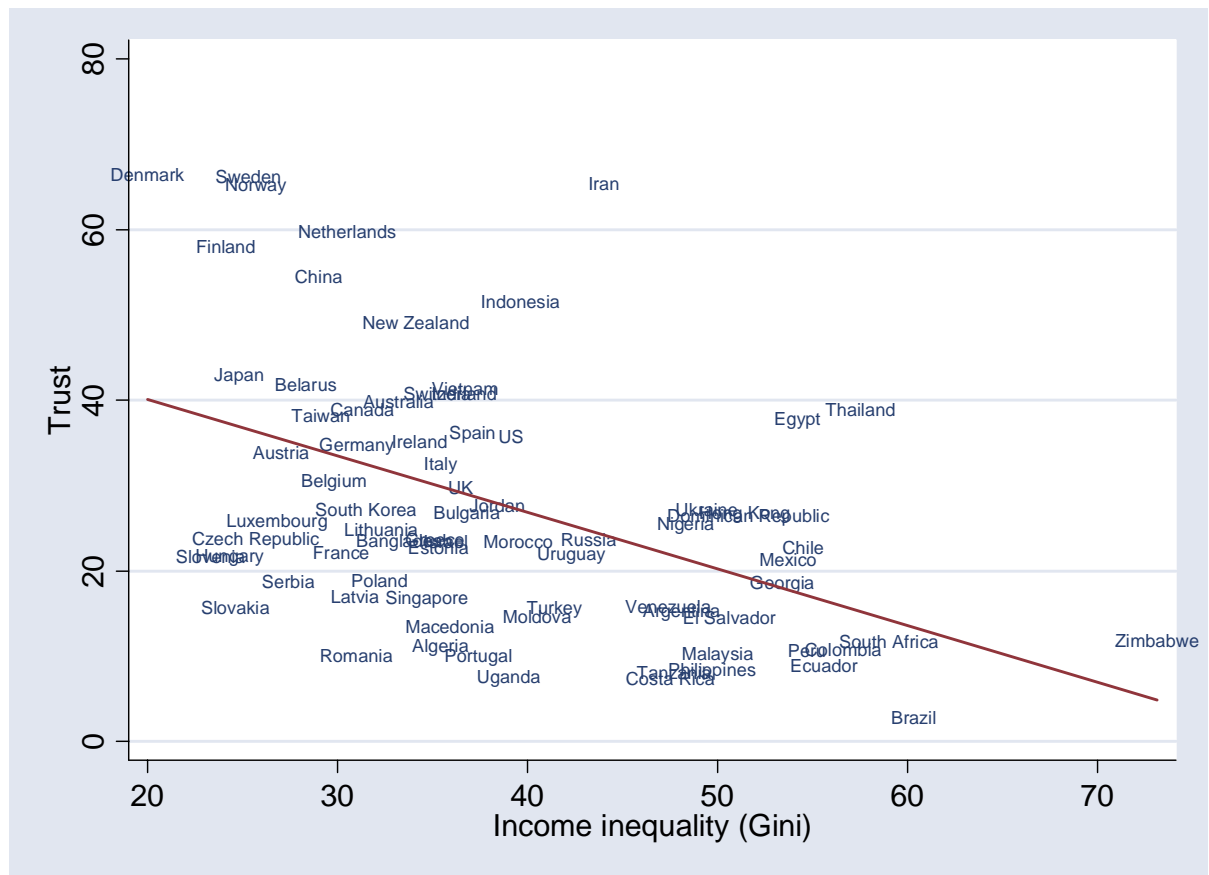
---

<sup>8</sup> In the latest, fourth version of the World Values Survey the question is “Generally speaking, would you say that most people can be trusted or that you need to be very careful when dealing with people?” In the literature this is usually referred to as *generalized trust*, which is different from *particularized trust*. Unlike generalized trust, particularized trust entails trusting people that you have a personal experience with. Generalized trust is similar to *bridging* and particularized trust to *bonding* social capital (cf. Putnam 2000, p 22).

Income inequality and trust are strongly and robustly correlated in the cross-country studies – see e.g. Knack and Keefer (1997), Zak and Knack (2001), Berggren and Jordahl (2006), Leigh (2006a) and Bjørnskov (2007). Unlike the other studies, Leigh (2006a) includes observations of trust at the individual level (in 59 countries). Fischer and Torgler (2006), also with individual trust observations from 25 countries, show that trust is positively correlated with a person's relative income position. Since the estimated effect is larger for incomes below the reference point, inequality is expected to reduce trust in the aggregate. Figure 1 displays the negative relationship between income inequality, measured by the Gini coefficient, and the share of trusting people for 75 countries (the correlation coefficient equals  $-0.47$ ).

Regardless of the strength of the correlation in Figure 1, cross-country studies are at best suggestive of a causal effect of inequality on trust. It is well-known that cross-country studies are plagued by omitted variables, endogeneity, measurement error and influential outliers. One can hardly come to conclusions about individual behavior and attitudes by studying data at the country level. Conclusions about the mechanisms linking inequality to trust are even more distant.

**Figure 1.** Income inequality and trust across countries



Notes: Trust is the most recent country average from the World Values Surveys conducted in 1997 and in 1999–2001, supplemented with a few observations from the Danish Social Capital Project (see Bjørnskov, 2007). Income inequality is the Gini coefficient from around 1995, from the UNU/WIDER World Income Inequality Database, Version 2.0b, May 2007. A line with fitted values from a univariate linear regression of trust on inequality is displayed in the figure. All Gini coefficients are calculated by WIDER and are based on sources with full coverage in terms of area, population and age, and with a quality rating no worse than 3. For most countries there are several observations to choose between. The primary preferences underlying the selection are as follows: household as the statistical unit, person as the unit of analysis and household per capita as the equivalence scale. The secondary preferences regard the income definition and rank disposable income before gross income, consumption, and expenditure (in descending order of preference). Most observations are from 1995; the Australian observation from 1989 is the largest deviation from this year. All else equal, observations from the Deininger and Squire data set are chosen.

## **5. Individual trust across local communities**

The cross-country studies described in the previous section should be seen as a first tentative step towards establishing a causal effect of inequality on trust. Further investigations are needed to reach firmer conclusions. Combining individual-level survey data on trust with income inequality measures from local communities holds several advantages. Measures of income inequality are more readily comparable between geographical units within a country, although the variation in inequality may be smaller within than between countries. Another advantage is that individual determinants of trust (e.g. education) can be held constant. Country-specific institutional determinants of trust are obviously held constant when a single country is studied.

Alesina and La Ferrara (2002) study individual level data from US localities and find that trust is lower in metropolitan areas with an uneven distribution of income. However, the effect of racial heterogeneity is even stronger in their study and income inequality is no longer statistically significant when this variable is added to the empirical model. Their interpretation of the results is in line with the social ties mechanism. Trust is lower in heterogeneous communities since contacts between dissimilar people (arguably without social ties to each other) are more common. This is the case both for interracial contacts and for contacts between people in different income brackets. The alternative so called “local interaction” interpretation receives less support. This interpretation starts out from the findings that the poor are less trusting and that the fraction of poor people is higher in more unequal communities. Then, people living in unequal communities may trust less since they are influenced by their distrustful neighbors.

For Australia, Leigh (2006b) reports in a similar study that trust is lower in ethnically and especially in linguistically heterogeneous neighborhoods, but he finds no relation between economic inequality and trust. These results are obtained both for “most Australians” (generalized trust) and for “most people in my local area” (localized trust).

Taken together the studies by Alesina and La Ferrara (2002) and Leigh (2006b) provide rather weak evidence of a link from income inequality to trust. This could of course mean that

there is no such link, but it could also reflect limitations of the data used to construct their measures of inequality. One such limitation is that the data do not contain information on how the trust of a given individual is affected by a change in income inequality. Alesina and La Ferrara's Gini coefficient is also a bit shaky in the sense that they use family income from three censuses (in 1970, 1980 and 1990) to generate annual data for the period 1974–1994 by interpolation and extrapolation. This means that they measure income inequality with some error, which could lead to underestimation (attenuation bias) of its influence on trust. Given the strong relation between economic inequality and racial heterogeneity in the US it could also be problematic to distinguish the effects of those two variables empirically. Leigh uses data from one point in time (1997–1998) so he does not have to do any interpolation or extrapolation, but the obvious drawback is that no changes in inequality and trust are observed. The neighborhood or suburb level could also be too small to capture all aspects of income inequality in the presence of residential segregation by income. Segregation could be an important mechanism through which inequality reduces trust.

The described data limitations are absent in a recent Swedish study by Gustavsson and Jordahl (2007) which combines individual-level panel data on trust with county level inequality measures computed from register based individual income data for a large representative sample. The results for the period 1994–1998 show that income inequality is associated with lower trust – especially differences in the bottom half in the income distribution (measured by the 50/10 percentile ratio) seem to be important.<sup>9</sup> This suggests that other measures of income inequality than the Gini coefficient should be tested in other countries. The study also indicates that it is primarily inequality in disposable income rather than in pre tax income that matters for trust. This

---

<sup>9</sup> Quantitatively, the results in Gustavsson and Jordahl (2007) show that changes in the 50/10 percentile ratio can have a substantial impact on trust. Trust is predicted to decrease by 1.4 units on its 0–10 scale (the standard deviation of this trust measure is 2.2) if the 50/10 percentile ratio would increase from its mean of 1.82 to its maximum of 2.05 (in Stockholm).

means that consumption opportunities are more important than earnings capacity, and that redistribution of income could influence trust. Another result is that the proportion of people born in a foreign country is negatively associated with trust.

Given Sweden's low level of economic inequality, the study can arguably be seen as a tough test of the relationship between inequality and trust. On the other hand, Sweden's egalitarian political tradition may imply that trust is more sensitive to changes in the income distribution than in other countries such as the US. In fact, the study demonstrates that a given increase in inequality brings about a stronger reduction in trust among people who would like to see a more even distribution of income. This is broadly in line with the mechanism based on inference on social relationships (since it is natural to prefer a more equal income distribution if inequalities are viewed with suspicion), with similarities to the argument and findings in Fischer and Torgler (2006). The mechanism based on the opportunity cost of time receives some support since individual income (which arguably reflects wages) is positively related to trust, but this mechanism cannot explain the negative relationship between inequality and trust that remains when individual income is controlled for.

Going beyond studies of trust, there is suggestive evidence in favor of the mechanism based on conflicts over resources to the extent that there is more crime in unequal societies (see e.g. Kelly, 2000). However, a problem with this interpretation is that the poor are generally less trusting than the rich. Unless this can be explained by deeper personal factors, it contradicts the mechanism based on conflicts over resources.

## **6. Causality issues**

An important reason for the large interest in trust is that societies where people trust each other seem to work better in many dimensions. Given the large number of outcome variables that have been claimed to depend on trust, one has to wonder if any economic variable can be treated as exogenous.

When it comes to inequality, Alesina and La Ferrara (2002) mention that trusting communities may offer better opportunities for the poor. This could be the case if risk sharing and informal credit transactions are facilitated by trust. Leigh (2006b) mentions that less trusting people might move to more heterogeneous neighborhoods if they prefer to live there. There is also the possibility that trust influences inequality indirectly through an effect on economic growth.<sup>10</sup>

Some attempts have been made to identify the causal effect of inequality on trust by using instrumental variables. This section discusses what has been done in studies based on individual level trust data. A valid instrument has to be both relevant (related to inequality on the basis of theoretical argument and by statistical correlation) and exogenous (not directly related to trust after controlling for the explanatory variables). In his cross-country study with individual-level trust data, Leigh (2006a) uses the ratio of the size of the cohort aged 40–59 to the population aged 15–69 as an instrument for the Gini coefficient. Since he includes individual age as a control variable, the most obvious objection to this instrument is neutralized. However, as in most cross-country studies, omitted variables are an issue. Especially worrying is the lack of income data at the individual level. Since the relevance of the instrument is established by the correlation of age and earnings, it cannot be exogenous – many studies report a positive correlation between individual income and trust.

Alesina and La Ferrara (2002) use the number of municipal and township governments in 1962, the percentage of revenues from intergovernmental transfers in 1962 and the share of the labor force in the manufacturing sector in 1990 as instruments for the Gini coefficient in 1970, 1980 and 1990. It should be safe to say that the exogeneity of these three instruments can be discussed. Leigh (2006b) uses the Gini coefficient and other variables at the regional level (about 460,000 people) as instruments for the Gini coefficient at the neighborhood level (about 20,000

---

<sup>10</sup> For the link from trust to growth see Knack and Keefer (1997), Zak and Knack (2001) and Berggren et al. (2007). For the link from growth to inequality see Kuznets (1955) and Persson and Tabellini (1994).



people). This helps if locality choices are endogenous, but does not resolve other endogeneity problems.

Gustavsson and Jordahl (2007) use international demand for Swedish manufacturing goods as an instrument for the 50/10 percentile ratio of incomes. The idea is that international demand affects the income distribution differently across the counties depending on their industrial structure. International demand qualifies as an instrument as it is clearly exogenous and is not expected to have a direct effect on trust. The results from this exercise indicate that there is indeed an effect of income inequality on trust.

## **7. Experimental evidence**

Several experimental economists have criticized the reliability of survey based measures of trust, instead preferring to study “trust games” in the field or in the laboratory (see e.g. Carpenter, 2000). Although experiments are often criticized for lacking external validity (inequality observed or induced in an experiment may not be relevant in real life situations), an important advantage is that they can be designed to discriminate between different explanations of a phenomenon. Of the four underlying mechanisms presented in this paper, the one based on social ties have received most attention – and support – in the experimental studies.

The propensity to put more trust in someone who is closer socially is demonstrated in a seminal article of Glaeser et al. (2000), but see Anderson et al. (2006) for some dissent. Möbius and Szeidl (2007) report a strong and robust relationship between network flow measures of trust and trusting behavior in experiments. They explain trust as a function of “social collateral” that can be used to enforce informal contracts in social networks. In a related study, Leider et al. (2007) show that favors granted to friends and strangers in a dictator game can be explained by enforced reciprocity (expecting repayment in the future) but not by signaling one’s generosity or by preference-based generosity.

Although these studies indicate that social ties are relevant for the link from inequality to

trust, they do not show how and to what extent income inequality affects the structure and density of social networks.

## **8. Concluding remarks**

Economic inequality seems to be a strong determinant of trust. This relationship shows up consistently in different studies, although in a few of them it is not statistically significant. The detailed investigation of Gustavsson and Jordahl (2007), which addresses several empirical problems, confirms the negative association and indicates that income differences in the bottom half of the income distribution may have a particularly strong influence on trust.

Discriminating between the four proposed causal mechanisms is difficult, but social ties appear to receive the strongest support. Alesina and La Ferrara (2002) interpret their findings in line with this mechanism (dissimilarity reduces trust) and the experimental evidence is also affirmative. One can also mention a survey conducted by Johansson-Stenman (2006) which shows that the higher a person's income, the more he is willing to trust someone with high income relative to someone with low income. It is, however, less straightforward to explain Gustavsson and Jordahl's (2007) finding that inequalities in the bottom half of the income distribution are especially important.

The mechanism based on inference on social relationship also receives some support. It is consistent with the observation in Gustavsson and Jordahl (2007) that a given increase in inequality brings about a stronger reduction in trust among people who would like to see a more even distribution of income. The prediction that inequality reduces the trust of people all over the income distribution, and especially in rich trustees, has not been tested distinctly, but it is not inconsistent with the available evidence.

The mechanisms based on conflicts over resources and opportunity cost of time suggest the same influence of inequality at the aggregate level, but the underlying individual-level effects are diametrically opposed to each other. According to the mechanism based on the opportunity cost

of time, inequality increases trust among people with high income and reduces trust among people at the bottom of the income distribution. The mechanism based on conflicts over resources predicts the exact opposite pattern. Since they have so little to lose, inequality is expected to increase the trust of people with low income.

At first glance, the fact that there is more crime in unequal societies makes the mechanism based on conflicts over resources attractive. But the observation that the poor are less trusting (Alesina and La Ferrara, 2002; Gustavsson and Jordahl, 2007) and appear to be more trusted (Johansson-Stenman 2006, p 17) contradicts this mechanism. The political formulation of this mechanism, stating that inequality makes both the rich and the poor less willing to trust the other group, is not at odds with the evidence. On the other hand it has not been tested thoroughly.

The positive correlation between individual income and trust fits the opportunity cost of time mechanism, but this mechanism still fares worst in the sense that the estimated effect of income inequality on trust remains when individual income is held constant. This implies that there is much more to the connection between inequality and trust than what can be explained by differences in the opportunity cost of time.

Clear-cut tests of the four mechanisms would ideally be based on data with observations of various pairs of trusters and trustees, including the income of each one of them. Further studies – surveys and experiments – should focus on this kind of data and dig deeper into the four proposed mechanisms. Economic inequality seems to reduce trust and this probably relates to social ties, but much uncertainty remains about the underlying causal mechanisms.

## References

- Alesina, Alberto and Eliana La Ferrara (2000), 'Participation in heterogeneous communities', *Quarterly Journal of Economics*, **115** (3), 847–904.
- Alesina, Alberto and Eliana La Ferrara (2002), 'Who trusts others?', *Journal of Public Economics*, **85** (2), 207–234.
- Anderson, Lisa R., Jennifer M. Mellor, and Jeffrey Milyo (2006), 'Induced heterogeneity in trust experiments', *Experimental Economics*, **9** (3), 223–235.
- Atkinson, Anthony B. and Andrea Brandolini (2001), 'Promise and pitfalls in the use of 'secondary' data-sets: Income inequality in OECD countries', *Journal of Economic Literature*, **39** (3), 771–799.
- Berggren, Niclas and Henrik Jordahl (2006), 'Free to trust: Economic freedom and social capital', *Kyklos*, **59** (2), 141–169.
- Berggren, Niclas, Mikael Elinder and Henrik Jordahl (2007), 'Trust and growth: A shaky relationship', *Empirical Economics*, forthcoming.
- Bjørnskov, Christian (2007), 'Determinants of generalized trust: A cross-country comparison', *Public Choice*, **130** (1–2), 1–21.
- Boix, Carles and Daniel N. Posner (1998), 'Social capital: Explaining its origins and effects on government performance', *British Journal of Political Science*, **28** (4), 686–95.
- Carpenter, Jeffrey P., (2000), 'Measuring social capital: Adding field experimental methods to the analytical toolbox', in Jonathan Isham, Thomas Kelly and Sunder Ramaswamy (eds), *Social Capital and Economic Development*, Cheltenham, UK and Northampton, MA, US: Edward Elgar, pp. 119–137.
- Coleman, James (1990), *Foundations of Social Theory*, Cambridge MA: Harvard University Press.
- Coffé, Hilde and Benny Geys (2006), 'Community heterogeneity: A burden for the creation of social capital?', *Social Science Quarterly*, **87** (5), 1053–1072.

- Costa, Dora L. and Matthew E. Kahn (2003), 'Understanding the American decline in social capital, 1952–1998', *Kyklos*, **56** (1), 17–46.
- Deininger, Klaus and Lyn Squire (1996), 'A new data set measuring income inequality', *World Bank Economic Review*, **10** (3), 565–591.
- Fehr, Ernst and Klaus M. Schmidt (1999), 'A theory of fairness, competition and co-operation', *Quarterly Journal of Economics*, **114** (3), 817–868.
- Fischer, Justina A.V. and Benno Torgler (2006), 'The effect of relative income position on social capital', *Economics Bulletin*, **26** (4), 1–20.
- Fukuyama, Francis (1995), *Trust: The Social Virtues and the Creation of Prosperity*, New York: Free Press.
- Glaeser, Edward L., David I. Laibson, Jose A. Scheinkman and Christine L. Soutter (2000), 'Measuring trust', *Quarterly Journal of Economics*, **115** (3), 811–846.
- Gustavsson, Magnus and Henrik Jordahl (2007), 'Inequality and trust in Sweden: Some inequalities are more harmful than others', *Journal of Public Economics*, forthcoming.
- Hardin, Russel (2006), *Trust*, Cambridge, UK: Polity Press.
- Johansson-Stenman, Olof (2006), 'Who are the trustworthy, we think?', Working Paper no 222, Göteborg: Department of Economics, Göteborg University.
- Kelly, Morgan (2000), 'Inequality and crime', *Review of Economics and Statistics*, **82** (4), 530–539.
- Knack, Stephen and Philip Keefer (1997), 'Does social capital have an economic pay-off? A cross-country investigation', *Quarterly Journal of Economics*, **112** (4), 1251–1288.
- Kuznets, Simon (1955), 'Economic growth and income inequality', *American Economic Review*, **45** (1), 1–28.
- Leider, Stephen, Markus Möbius, Tanya Rosenblat and Quoc-Anh Do (2007), 'Directed altruism and enforced reciprocity in social networks: How much is a friend worth?', NBER Working Paper no 13135, Cambridge, MA: National Bureau of Economic Research.

- Leigh, Andrew (2006a), 'Does equality lead to fraternity?', *Economics Letters*, **93** (1), 121–125.
- Leigh, Andrew (2006b), 'Trust, inequality and ethnic heterogeneity', *Economic Record*, **82** (258), 268–280.
- Möbius, Markus and Adam Szeidl (2007), 'Trust and social collateral', NBER Working Paper no 13126, Cambridge, MA: National Bureau of Economic Research.
- Ostrom, Elinor (1998), 'A behavioral approach to the rational choice theory of collective action', *American Political Science Review*, **92** (1), 1–22.
- Persson, Torsten and Guido Tabellini (1994), 'Is inequality harmful for growth?', *American Economic Review*, **84** (3), 600–621.
- Piketty, Thomas and Emmanuel Saez (2003), 'Income inequality in the United States: 1913–1998', *Quarterly Journal of Economics*, **118** (1), 1–39.
- Putnam, Robert D. (2000), *Bowling Alone: The Collapse and Revival of American Community*, New York: Simon and Schuster.
- Rothstein, Bo (2005), *Social Traps and the Problem of Trust*, Cambridge, UK: Cambridge University Press.
- Rothstein, Bo and Eric M. Uslaner (2005), 'All for all: Equality, corruption, and social trust', *World Politics*, **58** (1), 41–72.
- Svendsen, Gert T. and Gunnar L.H. Svendsen (2008), *Handbook of Social Capital*, Cheltenham, UK: Edward Elgar, forthcoming.
- Yamagishi, Toshio and Midori Yamagishi (1994), 'Trust and commitment in the United States and Japan', *Motivation and Emotion*, **18** (2), 129–166.
- Zak, Paul J. and Stephen Knack (2001), 'Trust and growth', *Economic Journal*, **111** (470), 295–321.