

# **Corruption and Inequality as Correlates of Social Trust: Fairness Matters More Than Similarity**

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## **ABSTRACT**

I argue that the fairness of a society affects its level of social trust more than does its homogeneity. Societies with fair procedural rules (democracy), fair administration of rules (freedom from corruption), and fair (relatively equal and unskewed) income distribution produce incentives for trustworthy behavior, develop norms of trustworthiness, and enhance interpersonal trust. Based on a multi-level analysis using the World Values Surveys data that cover 80 countries, I find that (1) freedom from corruption, income equality, and mature democracy are positively associated with trust, while ethnic diversity loses significance once these factors are accounted for; (2) corruption and inequality have an adverse impact on norms and perceptions of trustworthiness; (3) the negative effect of inequality on trust is due to the skewness of income rather than its simple heterogeneity; and (4) the negative effect of minority status is greater in more unequal and undemocratic countries, consistent with the fairness explanation.

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## **I. INTRODUCTION**

According to recent research, social trust, or “generalized interpersonal trust,” reduces transaction costs and thus contributes to economic growth, helps to solve collective action problems, facilitates civic engagement, and leads to better functioning government (Putnam 1993, 2000; Fukuyama 1995; Knack and Keefer 1997; La Porta et al. 1997).

Societies vary greatly in their level of social trust, as Table 1 indicates. More than 65 percent of people in Denmark, Sweden, and Norway agreed that most people can be trusted, while only 3 percent of Brazilians did so, according to the recent World Values Surveys and European Values Study (Inglehart et al. 1999, 2004). Hence, it is of great importance to understand what societies, what kinds of societal conditions, and what political and social institutions, lead to higher or lower levels of social trust.

The term “social trust” (generalized interpersonal trust) should be distinguished from “political trust” (confidence in political and public institutions). Social trust, as “generalized thin trust,” also should be distinguished from trust embedded in personal relations, or “particularized thick trust.” The literature on social trust has looked at individual and societal characteristics that may affect social trust. Three kinds of individual characteristics have been proposed as determinants of generalized trust: 1) civic engagement and organizational membership (Putnam 1993, 2000), 2) individuals’ life experiences of becoming winners or losers in society (Newton 1999; Putnam 2000: 138), and 3) optimism and sense of control over the future that is formed during early socialization (Uslaner 2002).

Many empirical studies have identified various possible causes of social trust at the societal level, but existing explanations are theoretically weak and the empirical tests are far from adequate. Economic development, democracy, income equality, control of corruption, ethnic homogeneity, and Protestantism have often been found to be significantly positively associated with social trust (Alesina and La Ferrara 2002; Delhey and Newton 2004; Inglehart 1999; La Porta et al. 1997; Leigh 2003; Uslaner 2002; Zak and Knack 2001). However, the significance of these variables has often varied depending on the data, sample, and specification. Moreover, these variables are so closely correlated with each other that it is hard to identify which causes which. For example, economic development may be more a consequence than a cause of social trust.

**Table 1. Percentage of People Who Agree That Most People Can Be Trusted**

country	1995-97	1999-2001	country	1995-97	1999-2001
Denmark		66.5 (64.1)	Bangladesh	20.9	23.5 (23.3)
Sweden	59.7	66.3 (63.7)	Morocco		23.5 (22.9)
Iran		65.3 (49.6)	Israel		23.5 (22.9)
Norway	65.3		Georgia	23.4	
Netherlands		59.8 (59.4)	Estonia	21.5	22.8 (21.7)
Finland	47.6	58.0 (56.8)	Chile	21.9	22.8 (22.2)
China	52.7	54.5 (52.5)	Puerto Rico	6.0	22.6 (22.4)
Indonesia		51.6 (45.5)	Ghana	22.5	
New Zealand	49.1		France		22.2 (21.4)
Japan	46.0	43.1 (39.6)	Uruguay	22.1	
Belarus	24.1	41.9 (38.0)	Hungary		21.8 (21.4)
Taiwan	41.8		Slovenia	15.5	21.7 (21.2)
Viet Nam		41.3 (38.9)	Mexico	28.1	21.3 (20.8)
Iceland		41.1 (39.3)	Malta		20.7 (20.4)
India	39.2	41.0 (38.9)	Azerbaijan	20.5	
Switzerland	41.0		Serbia and Montenegro	29.9	19.7 (19.5)
Australia	39.9		Poland	17.9	18.9 (18.9)
Canada		38.8 (38.4)	Croatia	23.6	18.4 (17.9)
Egypt		37.9 (37.5)	Latvia	24.7	17.1 (16.7)
Spain	29.8	36.2 (34.5)	Singapore		16.9 (16.7)
United States	35.6	35.8 (35.5)	Venezuela	13.7	15.9 (15.8)
Ireland		35.2 (34.6)	Bosnia and Herzegovina	28.3	15.8 (15.6)
Germany	41.8	34.8 (33.1)	Turkey	5.5	15.7 (15.5)
Austria		33.9 (31.3)	Slovakia		15.7 (15.2)
Italy		32.6 (31.8)	Argentina	17.5	15.4 (15.0)
Pakistan	20.6	30.8 (28.2)	Moldova	22.2	14.7 (14.1)
Belgium		30.7 (29.4)	El Salvador	14.6	
Great Britain	29.6	29.7 (28.5)	Macedonia	8.2	13.5 (13.1)
Jordan		27.7 (27.1)	Zimbabwe		11.9 (11.7)
Korea (South)	30.3	27.3 (27.3)	South Africa	18.2	11.8 (11.5)
Ukraine	31.0	27.2 (26.1)	Algeria		11.2 (10.8)
Bulgaria	28.6	26.9 (24.9)	Colombia	10.8	
Dominican Republic	26.4		Peru	5.0	10.7 (10.6)
Luxembourg		26.0 (24.9)	Romania		10.1 (9.9)
Nigeria	19.5	25.6 (25.3)	Portugal		10.0 (9.8)
Lithuania	22.2	24.9 (23.4)	Philippines	5.5	8.4 (8.3)
Armenia	24.7		Tanzania		8.1 (7.7)
Albania		24.4 (23.2)	Uganda		7.6 (7.6)
Czech Republic		23.9 (23.4)	Brazil	2.8	
Greece		23.7 (20.5)	Mean	26.4	27.6 (26.4)
Russian Federation	24.1	23.7 (22.9)	Std. Dev.	14.0	14.7 (13.5)

Source: World Values Surveys (1995-97, 2000-01) and European Values Study (1999)

*Note:* Countries are listed in the order of rank for the 1999-2001 surveys and then for the 1995-97 surveys. Entries are percentages of respondents who chose to agree that most people can be trusted “among the respondents who answered the trust question,” weighted by sampling weights. For the 1999-2001 surveys, entries in parentheses are percentages of trusting respondents “among the whole interviewees including those who did not answer the trust question.” For example, in Iran many interviewees did not answer the question, and the two percentages are substantially different. Arguably, the level of social trust in Iran may be better represented by the percentage in parenthesis.

Democracy and social trust are strongly correlated with each other, and Booth and Bayer (1998:43) found that repressive governments discouraged trust. However, Inglehart (1999) found that democracy lost significance when per capita income and religious traditions were included in the explanatory variables. Regarding the effect of corruption, conflicting findings exist. Seligson (2002) demonstrated, through individual-level analysis of surveys of four Latin American countries, that exposure to corruption not only erodes confidence in the political system but also reduces interpersonal trust. Zak and Knack (2001) found corruption significant across countries, but Uslaner (2002, 2004) found it insignificant and argued that causation runs from trust to freedom from corruption and not from corruption to trust.

Income equality and racial/ethnic homogeneity were most often found to be significant. Alesina and La Ferrara (2002) proposed “similarity/dissimilarity explanation”, or “aversion to heterogeneity” theory. They argue that it is easier to trust similar people than dissimilar people in terms of income, race, ethnicity, etc. Their explanation has created a great deal of anxiety among many scholars and policy makers, in particular those who advocate cultural diversity and the welfare state. Since social trust is often regarded as necessary for the support for the welfare state, support for ethnic and cultural diversity might jeopardize the welfare state (Van Parijs 2004; Pearce 2004). So, it was termed a new “progressive dilemma” (Pearce 2004).

The “aversion to heterogeneity” explanation implies that trust should be lower in more diverse and heterogeneous societies in terms of racial, ethnic, linguistic, or religious composition as well as income and wealth. However, Delhey and Newton (2004) find that *linguistic* and *religious* homogeneity is not associated with social trust across countries, while *ethnic* homogeneity is. Alesina and La Ferrara (2002) find that “ethnic fragmentation” (based on 10 categories of ethnic/national origin) is not correlated with distrust in the US, while “racial fragmentation” (along the five racial categories of the Census) is highly significant. These facts raise a question about what determines the salience of certain differences since there are a large number of traits that distinguish people.

Even more puzzling is the finding that trust within own racial group as well as interracial trust is substantially lower in racially diverse communities, according to the Social Capital Community Benchmark Survey conducted in the US (Saguaro Seminar 2001). The similarity

explanation does not explain why trust among Whites as well as trust among Blacks goes down as the percentage of Blacks increases. Also, it is questionable to interpret the negative effect of income inequality as being caused by its simple heterogeneity. Income *inequality* may not be reduced to its simple *dissimilarities*, and perhaps other aspects of inequality such as *unfairness* or *exploitation* may be real causes of distrust.

Considering the inherent difficulty of sorting out causal directions with statistical analysis, it is of great importance to establish a better theory of social trust that illuminates the causal mechanisms. Empirical analysis needs to go beyond testing and identifying variables that are significant controlling for other plausible covariates. Competing theories should be made falsifiable, and multiple implications and causal mechanisms need to be empirically tested.

In this paper, I present a new theory of social trust, the “fairness explanation”, which posits that fair societies in terms of *distributive*, *procedural*, and *formal* justice tend to encourage trustworthy behavior as well as trust in others. The fairness idea is not totally new. Rothstein and Stolle (2003) argued that procedural fairness encourages social trust, and Uslaner (2004) also linked trust with fairness. Building on their insights, I develop a more comprehensive theory about why and how various aspects of social justice affect social trust, emphasizing the role of political and legal institutions.

I test multiple implications of my theory against the predictions of the similarity explanation through a variety of statistical analyses across the sample of 80 countries included in the World Values Surveys and European Values Study (1995-97 and 1999-2001). In particular, I make a methodological contribution by employing multi-level statistical analysis and multiple imputation of missing data that were not used in the previous studies of social trust, to my knowledge.

In the next two sections, I present the “fairness explanation” and compare it with the “similarity explanation.” I describe the data and methods in section 4. Empirical findings and interpretations from my statistical work are presented in section 5. The final section summarizes and concludes with discussion of some research and policy implications.

## **II. TRUST, TRUSTWORTHINESS, AND FAIRNESS OF SOCIETY**

Person A’s trust in person B typically reflects A’s past experience with B’s trustworthiness.

Since trusting can be both beneficial and costly, A will use the available information about B's integrity (intention to keep his/her promises), competence (ability to produce promised outcomes), and fairness (equal and impartial treatment for similar cases). For the vast majority of people, however, we do not know them personally and hence cannot decide whether to trust them. So, a person's trust in "other people in general" will reflect his/her direct and indirect experiences of trustworthiness of other people. Early socialization will be affected by parents' experiences with the trustworthiness of other people. Thus, the level of social trust in a society will reflect the collective experience of the overall trustworthiness of others.

Also, trust will produce greater trustworthiness. Distrusting people are less likely to cooperate in collective action problems. If you believe most other people are evading taxes, you are also likely to cheat on your taxes. Thus, trust and trustworthiness mutually reinforce each other (Putnam 2000: 137). Hence a theory of social trust should be able to explain what makes people act in a trustworthy manner as well as what makes people trust other people.

Hardin (1998) argues, "My trust in you is typically encapsulated in your interest in fulfilling my trust", and "if public officials are to be trusted, they must have interest in fulfilling the trust placed in them." Organizations can give role holders incentives for trustworthiness, and we can trust them because of institutional arrangements that make dishonesty risky and reward honesty. Different legal institutions can create different incentives for trustworthiness. However, human behavior is determined not simply by material incentives but also by values, norms, and perceptions (March and Olson 1989). Different institutional arrangements and social conditions can produce different norms about trustworthiness such as intolerance of corruption and cheating as unacceptable behavior. Perceptions also matter. If people perceive that most other people are cheating, they are more likely to justify their own cheating.

Levi (1998) and Rothstein and Stolle (2003) emphasized the role of the government and political institutions in generating social trust. Levi (1998) suggested that important characteristics of a state capable of producing interpersonal trust would be the capacity to monitor laws, to impose sanctions on lawbreakers, and to provide information and guarantees about those seeking to be trusted. Rothstein and Stolle (2003) argued that procedural fairness

encourages social trust, and specifically selective welfare programs, unlike universal welfare programs, erode social trust by encouraging cheating and corruption. Uslander (2004) also linked trust and fairness, arguing that inequality erodes trust and that distrust increases corruption.

Using Rawls's concepts of three kinds of "justice as fairness" (Rawls 1971), I argue that fair societies in terms of *distributive*, *procedural*, and *formal* justice generally produce more material incentives for, and norms of, trustworthiness. Fair rules that reward trustworthiness and punish untrustworthiness and fair administration of rules will increase incentives for trustworthy behavior, and hence reduce the costs of trust. Societies with fair rules and fair administration will more likely cause people to respect the rules and produce norms encouraging trustworthiness. Fairness of distributive outcomes will affect the sense of fairness, and thereby perceptions of trustworthiness. Thus, fairness of political and legal institutions will not only affect political trust, or confidence in public institutions, but also generalized interpersonal trust. This also implies that social trust will be positively correlated with political trust, although some previous literature found the independence of social trust from political trust (Norris 2002: 160-61).

**1) Formal justice and freedom from corruption:** Rawls (1971) defined 'formal justice' as "impartial and consistent administration of laws and institutions", whatever their substantive principles are. It implies equal treatment before the law. Corruption, as a violation of obligations of fairness for private gain, is obviously a breach of formal justice, and it involves betrayal of public trust placed in officials to act fairly and impartially. Although corrupt transactions require trust between corrupt actors, it is not "generalized interpersonal trust" but "particularized trust" based on exchange of benefits at the expense of other honest players while betraying the trust of the general public.

Why will corruption erode trust in other people in general, not just trust in public officials? Corrupt transactions typically involve private actors as well as public officials. When the rule of law is weak and corruption is rampant, both public officials and private actors have greater incentive to engage in corruption, cheating, and fraud because the expected costs of such untrustworthy behavior (eg., the probability and severity of punishment) usually decrease. Hence, trust becomes more costly because the other party may cheat without being punished.

Corruption will also affect norms about corruption. If people perceive they are surrounded by corruption, they may feel they have to accept and even participate in corruption. As corrupt practices spread and become habitual as “how things are done”, the norm of corruption is transmitted to subsequent generations (You and Khagram 2005). Thus, corruption breeds corruption, and a sense of unfairness discourages both trust and trustworthiness.

**2) Procedural justice and democracy:** The key principles of procedural justice are equal liberties and fair equality of opportunity, according to Rawls (1971). Democratic countries that guarantee all citizens equal political and civil rights and equal opportunity to seek public offices should produce more incentives for trust and trustworthiness, because people can hold untrustworthy officials accountable through elections and various mechanisms of checks and balances. Moreover, democratic forms of governance may spread over time into corporations, schools, and many other organizations that affect people’s everyday lives. People tend to perceive the same outcome as fairer when they have participated in the process which produced it and when everyone has been given equal rights (Lind and Tyler 1988). Thus, democracy is likely to enhance not only political trust but also social trust.

However, democracies, especially new democracies, also produce new incentives for corruption as political financing needs increase (Rose-Ackerman 1999). Previously unexposed corruption and misbehaviors of the powerful and the rich are more likely to be exposed, leading to higher perceived levels of corruption and untrustworthiness. In addition, early periods of democratization can produce more political and social conflicts and struggles, which were contained under authoritarian regimes. Thus, mature and stable democracy and early and partial democracy may have quite different effects on social trust.

**3) Distributive justice and income equality:** Distributive justice requires fair distributive rules and fair distributive outcomes. But it is not easy to agree as to what fair distribution means, and perfectly equal distribution is not necessarily fair. Rawls (1971) proposed that unequal distribution that is to the benefit of the least advantaged is just. Miller (1992) noted that people judge distributive justice using three criteria: equality, desert (merit), and need. Although income equality and fairness should be conceptually distinguished, one could still use income inequality as a proxy for distributive justice. In most existing capitalist societies, too much equality is rarely a problem of justice, although in former communist

countries the mandated equality would not have been perceived as fair because hard work was not rewarded and shirking was common. Merit-based distribution will produce inequality, but excessive inequality may not be justified even by merit criterion.

As the income gap between the rich and poor increases, everyone may have greater incentive for cheating and corruption because the expected benefit of such action increases, other things being equal. In particular, the rich can use more resources for corruption to their own benefit at higher levels of inequality. Thus, a higher income gap may produce higher cheating and corruption, and hence lower trust.

However, distributive justice may be better captured by skewness rather than by dispersion (income gap). If the distribution is close to normal, then most of the people are located around the mean with some very rich and very poor people in the tails. In that case, a substantial degree of income inequality may not pose a problem of fairness if everyone infers from the normal distribution that they have equal life chances. However, highly skewed distribution is likely to be (perceived as) unfair, where most people are poor and few people have a large share of national income. Merit-based distribution will not likely produce highly skewed distribution, assuming that the distribution of skill and effort is approximately normal.

Skewed distribution may be a result of a history or legal system of concentrated ownership, exploitation, discrimination, and/or corruption by the rich, and most poor people are likely to believe that the rules of the game are unfair and many people act unfairly. Poorer people are more likely to believe they are “unjustly under-rewarded,” while richer people are more likely to think they are “justly rewarded” (Jasso 1980). Also, the rich are more likely to be treated nicely by most people, perhaps because people may regard the relationships with richer people possibly more valuable for the future (Putnam 2000:138). Since higher skewness means a higher proportion of poor people, the proportion of people who regard the distribution unfair will increase with skewness. The sense of unfairness may convince many poor people that they cannot become rich by just means, and they may justify their own involvement in petty corruption and cheating. Thus, untrustworthy behaviors spread throughout the whole society and social trust declines accordingly.

In addition, as income distribution becomes more skewed to the right, more people are

relatively poor, and the median income becomes smaller than the mean income. The median voter's and the large number of poor people's subsequent demand for higher redistribution and higher taxation for the rich will give the rich greater incentive for corruption and illegal purchase of political influence to reduce tax rates and to evade taxes (You and Khagram 2005). Thus, skewness will be associated with higher corruption and lower social trust.

### **III. FAIRNESS OR SIMILARITY: COMPETING HYPOTHESES**

The similarity explanation is fundamentally related to perceptions, whereas the fairness explanation considers material incentives as well. People can be suspicious of others of a different race or ethnicity because of prejudice even when the others are in fact trustworthy. In addition, one could argue that homogeneous societies may have a better chance of developing fair rules and institutions than heterogeneous societies. Thus, the similarity explanation may go together with the fairness explanation.

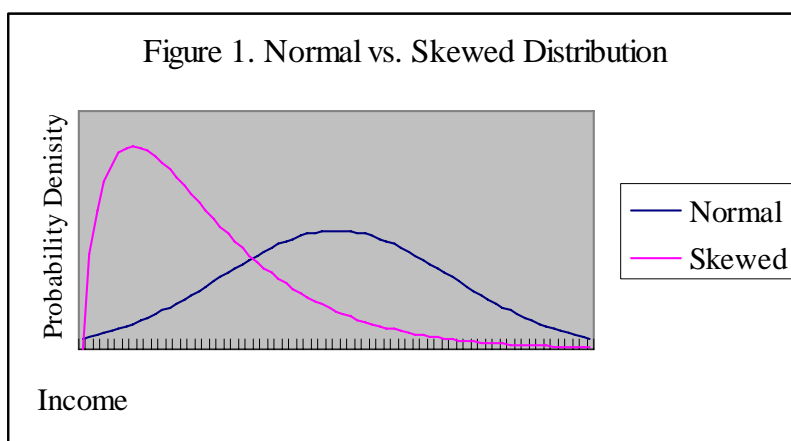
Unlike the similarity explanation, it is notable that the fairness explanation can explain the impact of corruption and democracy on trust and trustworthiness. The fairness explanation can also explain why political trust, or confidence in public institutions, is positively associated with social trust. If public institutions and public officials are trustworthy, private actors are more likely to observe the rules of the game and people's sense of fairness and generalized trust also will likely increase.

The fairness explanation incorporates the "winner vs. loser" explanation at the individual level. Unfair and discriminatory rules or unfair administration of rules will produce a large number of losers, and the poor will regard themselves as losers in unequal societies. The losers, especially those who lose big or repeatedly, may actually be the victims of unfair rules and practices, or they will likely suspect that the rules of the game are unfair or the rules are being administered unfairly. According to the psychological literature on attribution theory, people tend to attribute their successes to their own merits but attribute their failures to external factors (Martinko 1995). Thus, losers are less likely to trust others.

More importantly, there are some important questions about which the two theories make contradictory predictions. Although both theories expect income inequality to be negatively associated with trust and trustworthiness, there are important differences. First, the two

theories generate different predictions as to whether the poor, the rich, or the middle income class will be more trusting. The fairness explanation, together with the “winner vs. loser” explanation, predicts that the rich (winners) will be more trusting than the poor (losers). Since the rich are more likely to think they deserve their richness and are “justly rewarded,” they are more likely to perceive that the society is fair and that most people act fairly. On the other hand, the similarity explanation should predict that people in the middle of income distribution will have the highest level of trust because of the concentration of people within this economically homogeneous grouping, while the rich will have lowest levels of trust because their income levels are different from most of the people, especially under a skewed distribution.

Second, the skewness effect is predicted totally differently. Figure 1 illustrates two societies with the same level of income dispersion but with normal and skewed distribution, respectively. The logic of the similarity explanation implies that the society with skewed distribution should have a higher level of social trust, because most people are poor, and hence they will trust most other people who are also poor. However, the fairness explanation predicts differently. Higher skewness reflects greater unfairness and/or is perceived to be more unfair, and should be associated with a lower level of generalized trust.



Third, the effect of ethnic and cultural diversity may depend not just on the degree of diversity but on the fairness of ethnic relations. The salience of ethnic heterogeneity may depend on the degree of economic inequality and political inequality and on how closely the

ethnic lines overlap with these inequalities. Also, the effect of being a minority may depend on whether and how much the minority group has suffered discrimination. Social-psychological studies on interracial contact provide support to these hypotheses. More interracial contact can lead either to greater acceptance and trust or to greater prejudice and distrust, depending upon the situation in which it occurs. For example, equal-status contact generally reduces prejudice, but unequal-status contact increases prejudice (Pettigrew 1971: 275-6).

Table 2 summarizes the competing hypotheses based on the fairness and similarity explanations. By testing causal mechanisms and multiple implications of competing theories, we can avoid spurious findings.

**Table 2. Fairness vs. similarity explanation: Competing hypotheses**

	Fairness Explanation	Similarity Explanation
(1) Skewness	Skewness causes lower trust.	Skewness causes higher trust.
(2) Income effect	The richer are more likely to be trusting.	People in the middle of the distribution are most trusting.
(3) Ethnic/Cultural Diversity	Depends on the fairness of the ethnic relations and the whole society.	Negative
(4) Minority effect	Negative, but depends on fairness of the society.	Negative
(5) Democracy	Democracy increases trust in the long run.	No prediction
(6) Corruption	Corruption destroys trust.	No prediction
(7) Political Trust	Political trust is positively associated with social trust	No prediction
(8) Norms & Perceptions	Fair societies enhance norms and perceptions of trustworthiness.	Homogeneous societies increase perceptions of trustworthiness.

#### IV. DATA AND METHODS

1) **Micro Data:** For individual-level variables, I used data from the World Values Surveys (1995-1997 and 2000-2001) and the European Values Study (1999-2000) (Inglehart et al. 1999, 2004). The two surveys used virtually identical questionnaires and survey methodologies. The usable data for the purpose of this study contains 176,307 individuals in 80 countries on all continents of the world.

*Social trust* is a binary variable that takes the value of 1 for those who agreed that “most people can be trusted,” and 0 for those who chose to answer that “you can’t be too careful” (WVS 1995-97 and EVS 1999) or “you need to be very careful”(WVS 2000-2001) in dealing with people. Although the slightly different wordings for the second answer did not seem to produce large differences in average responses between the 1995-97 WVS and the 2000-01 WVS, the change of wording might have made differences in some countries. *Political trust* (scale: 1 to 4) is the average level of confidence in seven public institutions: the armed forces, the legal system, the police, the central government, political parties, parliament, and the civil service. This variable takes the value of 1 for “none at all”, 2 for “not very much”, 3 for “quite a lot”, and 4 for “a great deal” of confidence in each institution.

There are some concerns about the cross-cultural comparability of questions about social trust. The meaning of trust may be somewhat different across cultures and the expression “can’t be too careful” may be confusing or hard to translate for some languages. Yamagishi et al. (1999) argued that being careful does not necessarily mean lack of trust and that this trust question is not well-designed. Glaeser et al. (2000) raised another issue. In their experimental study, those individuals who answered that most people can be trusted did not act as if they trusted others, although they acted in a trustworthy manner. Thus, they raised the possibility that the WVS type trust question is better at capturing trustworthiness rather than trust.

However, their finding can be interpreted to mean that trust and trustworthiness are closely correlated so that trusting people tend to act in a trustworthy manner. Knack and Keefer (1997) also provided an experimental finding that social trust, measured by the percentage of people who agreed that most people can be trusted, is strikingly closely correlated across countries and regions with the number of wallets that were lost and subsequently returned with their contents intact. In addition, it should be noted that inferring trust from a person’s behavior is more difficult than inferring trustworthiness because it is harder to read someone’s mind than to judge someone’s actions.

In spite of concerns about cross-cultural comparability and reliability of WVS/EVS data, the trust question seems to reflect both trust and trustworthiness to a considerable degree. It is the best available data on social trust that covers a large number of countries and has been

used by previous empirical studies. Large measurement error in social trust will make standard errors large and some explanatory variables may lose significance while they are in fact significant. The good news is that it is not likely to produce bias, assuming the measurement error is not correlated with the independent variables.<sup>1</sup>

*Income* (1 to 10) refers to a subjective assessment of one's household income on a scale of 10 income groups, and *Education* (1 to 6) denotes six categories from "no formal education" to "university-level education, with degree".<sup>2</sup> The dummy variable *Minority* represents a respondent being a member of an ethnic minority in her or his country. *Perceived extent of corruption* (scale: 1 to 4) denotes how widespread a respondent thinks bribe taking and corruption are in the respondent's country. This variable is available for only the WVS conducted in 1995-97. *Voluntary membership* (0 to 1) is the normalized number of memberships in various kinds of voluntary organizations. Descriptive statistics of the individual-level variables and their correlations with "social trust" are presented in the upper panel of Table A1 in the Appendix.

**2) Macro Data:** As a measure of (perceived level of) "freedom from corruption", I use Kaufmann et al.'s (2003) Control of Corruption Indicator (CCI, average for 1996 and 1998). It is based on various sources of survey data that reflect the opinions of international business people and country experts, but it turns out to be -0.85 correlated with the domestic public's "perceived extent of corruption" from the WVS (1995-97). The correlation is negative because a higher CCI value represents a lower level of corruption.

I use three different measures of income inequality. *Gini coefficients* are the most commonly used measure of income inequality. Averaged for 1971-96, the coefficients were adjusted to make comparable across different definitions of gini such as the income-based and expenditure-based gini by You and Khagram (2005). Since the effect of inequality on social trust is likely to be a long-term effect, and single year data is likely to contain large measurement errors, it is better to use the averaged data for a long period. I constructed variables measuring dispersion (income gap) and skewness of income distribution to see

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<sup>1</sup> Measurement error in the dependent variable causes inefficiency, but it does not produce bias if it is uncorrelated with explanatory variables (Wooldridge 2002)

<sup>2</sup> The education variable has nine and eight categories in the 1995-97 and 1999-2001 surveys, respectively. I applied a consistent criterion to the data to make them comparable.

whether the inequality effect is driven by dispersion or skewness. *Natural log of “20/20 ratio”*, or the ratio of the top quintile income to the bottom quintile income, will be used as a measure of dispersion. *Natural log of “mean/median ratio”*, proxied by the ratio of mean income to the average income of the third quintile, will be used as a measure of skewness. They are also averaged for the period of 1971-96.

For ethnic and cultural diversity, I use *Ethnic fractionalization* and *Cultural fractionalization* data constructed by Fearon (2003), and ethnic, linguistic, and religious fractionalization data created by Alesina et al. (2003). The measure of ethnic fractionalization is given by the probability that two randomly drawn individuals of a country belong to two different ethnic groups. Thus, as fractionalization increases from zero to one, everyone in the society should be surrounded by a larger proportion of dissimilar people. Fearon’s cultural fractionalization data take into account cultural distance between ethnic groups as well, where cultural proximity is measured by the number of common classifications in the language tree.

As a measure of degree of democracy, I use Freedom House’s *Political rights score* (averaged for 1972-96).<sup>3</sup> As a measure of the age of democracy, I use *Consecutive years of democracy* (since 1950, up to 1995) based on the classification of Alvarez et al. (1996),<sup>4</sup> which ranges from 0 to 46 (Treisman 2000). The level of economic development will be represented by the *Natural log of GDP per capita* (in 1995 constant US dollars; averaged for 1971-96; from the World Bank’s World Development Indicators). Descriptive statistics of the country-level variables and their correlation with “mean social trust” (the average percentage of trusting respondents in each country from the WVS/EVS in 1995-97 and 1999-2001) are presented in the lower panel of Table A1 in the Appendix.

**3) Methods:** I will employ a two-level hierarchical non-linear model to estimate how much individual-level factors and country-level factors affect individuals’ probability of

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<sup>3</sup> The original scores were converted such that a higher score represents more freedom. For countries that became independent after the collapse of the Soviet Union and other former communist regimes, the political rights score for the former regimes was applied for the period before independence. The civil rights scores of the Freedom House contain an element of corruption, so I did not use them.

<sup>4</sup> Alvarez et al. consider a country democratic if the chief executive and the legislature are elected through the contestation by more than one party and if there has been at least one turnover of power between the parties during the last three elections of a chief executive. Treisman (2000) extended the Alvarez et al. data up to 1995.

trusting others as well as how country-level factors influence the effects of individual-level factors on social trust. Hierarchical models allow level-1 (individual-level) intercepts and coefficients to vary randomly across level-2 units (countries) and/or to be explained by level-2 variables.

Hierarchical models not only enable richer analysis but also solve statistical problems that conventional methods face. To run a probit or logit regression including country-level variables and interaction terms between individual-level variables and country-level variables would overlook characteristics of the error structure, because country-level predictors do not fully account for cross-country differences in the intercept and slopes of individual-level variables.<sup>5</sup> Hierarchical models explicitly incorporate both individual-level and group-level errors and combine multiple levels of analysis in a single comprehensive model by specifying predictors at different levels (Raudenbush and Bryk 2002; Steenbergen and Jones 2002).<sup>6</sup>

Problems of missing data often are very serious and may cause bias in cross-country empirical studies as well as in analyses of survey data. In order to alleviate this problem and to use the maximum available information, I employed the method of multiple imputation for the missing data (Allison 2002; King et al. 2001).<sup>7</sup> Without multiple imputation, I would have lost a great deal of valuable information from a number of observations in the analysis. This is particularly important because the conventional method of “listwise deletion” would substantially reduce the number of countries in the sample, which could cause selection bias. Many previous cross-country studies of social trust relied on too small sample size to generalize their findings.

By combining the WVS/EVS data for 1995-97 and 1999-2001 and employing multiple

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<sup>5</sup> Interactive models incorporate random error only at the individual level of analysis and assume that the error components are zero at the country level of analysis, which is unrealistic. Another conventional method uses country dummies to absorb the variation across countries, but this method cannot explain the differences in intercept and slopes of individual-level variables using country-level variables (Steenbergen and Jones 2002).

<sup>6</sup> I used the HLM 5 program for the hierarchical logit model of analysis.

<sup>7</sup> Multiple imputation involves imputing  $m$  values for each missing item and creating  $m$  completed data sets. The imputation model should contain at least as much information as the analysis model. I used King et al.'s software, “*Amelia*” (<http://GKing.Harvard.Edu>, accessed on 09/20/2004), for multiple imputation. I ran the same logit regressions for ten imputed data sets and combined the results to produce a single set of estimates for each model according to the formula suggested by King et al. (2001).

imputation for missing data, I was able, to the best of my knowledge, to conduct my analysis on the largest number of countries among cross-national studies of social trust. The correlation between the country means of social trust for the two waves of data is as high as 0.86, so pooled analysis is warranted and it may help reduce measurement error at the country level.

## V. RESULTS

**1) Multi-level analysis of correlates of social trust:** Table 3 presents the results of two-level hierarchical non-linear models with a logit link function predicting the probability of trusting with individual-level (level-1, hereafter) and country-level (level-2, hereafter) variables. With multiple imputation for missing values for both level-1 and level-2 data I was able to use the full available information for 176,307 individuals in 80 countries.<sup>8</sup> Both the level-1 intercept and several level-1 slopes (or coefficients) are explained by level-2 variables, and both the level-1 equation and level-2 equations have a random error term. I report the results of two models, and each model has one level-1 equation and multiple level-2 equations. Model 1 is the base model, and it has the following level-1 equation:

$$\text{Log [P/(1-P)]} = \beta_0 + \beta_1 (\text{Age}) + \beta_2 (\text{Age}^2) + \beta_3 (\text{Income}) + \beta_4 (\text{Education}) + \beta_5 (\text{Female}) + \beta_6 (\text{Unemployed}) + \beta_7 (\text{Rural}) + \beta_8 (\text{Minority}) + \beta_9 (\text{Catholic}) + \beta_{10} (\text{Protestant}) + \beta_{11} (\text{Orthodox}) + \beta_{12} (\text{Muslim}) + \beta_{13} (\text{Other Religion}), \text{-----} (1)$$

where P denotes the probability of trusting, and Age, Age<sup>2</sup>, Income, and Education are centered around the group mean. For example, Age=age – mean (age), for each country.

Level-2 equations are as follows.

$$\beta_0 = \lambda_{00} + \lambda_{01} (\text{GINI}) + \lambda_{02} (\text{Control of Corruption}) + \lambda_{03} (\text{Political Rights}) + \lambda_{04} (\text{Political Rights}^2) + \lambda_{05} (\text{ln GDP per capita}) + \lambda_{06} (\text{Ethnic Fractionalization}) + \varepsilon_0, \text{-----} (2)$$

$$\beta_k = \lambda_{k0} + \varepsilon_k, \text{ for } k=1, 2, 5, 6, 9, 10, 11, 12, \text{ and } 13, \text{-----} (3)$$

$$\beta_k = \lambda_{k0} + \lambda_{k1} (\text{ln GDP per capita}), \text{ for } k=3, 4, \text{ and } 7, \text{-----} (4)$$

$$\beta_8 = \lambda_{80} + \lambda_{81} (\text{GINI}) + \lambda_{82} (\text{Control of Corruption}) + \lambda_{83} (\text{Political Rights}) + \lambda_{84} (\text{ln GDP$$

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<sup>8</sup> Without multiple imputation of missing data, the usable observations in the multi-level analysis would be just 45,739 individuals in 31 countries in models 1 and 2, and 44,347 individuals in 29 countries in model 3.

per capita) +  $\lambda_{85}$  (Ethnic Fractionalization), ----- (5)

where all the level-2 variables are centered around the grand mean. For example,  $GINI = gini - \text{mean}(gini)$ , within the sample of 80 countries. The random error terms,  $\varepsilon_0$  and  $\varepsilon_k$ , have normal distribution with mean of zero and variance of  $\sigma_0^2$  and  $\sigma_k^2$ , respectively, i.e.,  $\varepsilon_0 \sim N(0, \sigma_0^2)$  and  $\varepsilon_k \sim N(0, \sigma_k^2)$ , for  $k=5, 6, 9, 10, 11, 12$ , and  $13$ .  $\sigma_k$  is set to zero for  $k=1, 2$ .<sup>9</sup>

The intercept ( $\lambda_{00}$ ) represents the expected log odds of trusting for a typical male (who has mean age, income and education within a country, is not unemployed, lives in a city, is not a minority, and has no religion) in a typical country (with mean values of level-2 variables and the error term of zero, i.e.,  $\varepsilon_0 = 0$ ). This conditional expected log odds is  $-1.0835$ , corresponding to a probability of  $1/\{1+\exp(1.0835)\} = 0.2528$ . Thus, the probability of trusting for a typical man in a typical country is predicted to be 25.3 per cent.

The effects of level-1 variables are generally consistent with previous findings. Winners in society such as people with higher income and higher education are significantly more likely to trust, and losers such as people in a minority or unemployed are substantially less likely to trust. Moving up one step on the income ladder of ten income groups increases the log odds of trusting for a typical male in a country with average per capita income by  $0.0404$ ,<sup>10</sup> which would result in the probability of trusting of  $1/\{1+\exp(1.0835-0.0404)\} = 0.2606$ . Thus, moving up one income group is associated with 0.8 percent increase in the propensity to trust others, controlling for other individual-level and country-level factors.

Females are significantly less trusting on average. Age has a slight non-linear effect, but generally older people are more trusting.<sup>11</sup> Rural residents are significantly more trusting. Protestants are significantly more trusting than people with no religion.

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<sup>9</sup> Ideally  $\beta_k$  should have random error term for  $k= 1, 2, 3, 4, 7$ , and  $8$  as well. However, the data do not allow the HLM 5 program to estimate the error term for all level-1 coefficients. Since these coefficients have relatively small variance components, I constrained their error term to be zero.

<sup>10</sup> Note that the slope for subjective income varies across countries, depending on per capita income. The income effect is greater in richer countries.

<sup>11</sup> The coefficients for Age and Age<sup>2</sup> indicate that trust increases up to the age of 89 (or 70, according to the model 2) other things being equal, but at a decreasing rate as age increases.

**Table 3. Two-Level Hierarchical Logit Model Results of Correlates of Social Trust**

	Model 1		Model 2		Model 3		
	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	
<i>Individual-level effects:</i>							
Intercept	-1.0835	(0.0688) ***	-1.0844	(0.0653) ***	-1.0609	(0.0668) ***	
Political trust					0.2954	(0.0211) ***	
Age	0.0070	(0.0019) ***	0.0070	(0.0019) ***	0.0083	(0.0019) ***	
Age squared	-0.000039	(0.000021)	-0.000034	(0.000021)	-0.000059	(0.000021) **	
Subjective Income	0.0404	(0.0030) ***	0.0405	(0.0031) ***	0.0403	(0.0030) ***	
Education	0.1016	(0.0043) ***	0.1016	(0.0044) ***	0.1068	(0.0044) ***	
Female	-0.0455	(0.0175) **	-0.0429	(0.0174) *	-0.0472	(0.0171) **	
Unemployed	-0.1271	(0.0294) ***	-0.1266	(0.0298) ***	-0.1110	(0.0287) ***	
Rural	0.0793	(0.0140) ***	0.0790	(0.0142) ***	0.0623	(0.0141) ***	
Minority	-0.2049	(0.0298) ***	-0.2042	(0.0313) ***	-0.2079	(0.0297) ***	
Catholic	-0.0275	(0.0393)	-0.0208	(0.0398)	-0.0487	(0.0406)	
Protestant	0.1173	(0.0526) *	0.1210	(0.0526) *	0.0669	(0.0528)	
Orthodox	-0.1104	(0.0625)	-0.0985	(0.0629)	-0.1174	(0.0589) *	
Muslim	0.0965	(0.0690)	0.0927	(0.0684)	0.0435	(0.0727)	
Other Religion	0.1392	(0.0465) **	0.1308	(0.0468) **	0.1127	(0.0472) **	
No Religion (Reference category)							
<i>Country-level effects:</i>							
a. On intercept							
Gini	-2.5165	(0.6216) ***	-2.3212	(0.6783) ***			
ln (mean/median)					-1.5430	(0.6851) *	
ln (20/20 ratio)					-0.0477	(0.2108)	
Control of Corruption	0.2417	(0.1174) *	0.1338	(0.1153)	0.2282	(0.1146) *	
Political Rights	-0.8719	(0.2241) ***	-0.6327	(0.2203) **	-0.7623	(0.2292) **	
Pol Rights^2	0.1060	(0.0249) ***	0.0848	(0.0241) ***	0.0901	(0.0262) ***	
ln GDP per capita	-0.1347	(0.0818)	-0.0645	(0.0805)	-0.1011	(0.0768)	
Ethnic Fractionalization	-0.1547	(0.2772)	-0.1533	(0.2588)	-0.0340	(0.2810)	
Catholic Population			-0.5995	(0.1677) ***			
b. On income effect							
ln GDP per capita	0.0127	(0.0019) ***	0.0127	(0.0019) ***	0.0123	(0.0019) ***	
c. On education effect							
ln GDP per capita	0.0717	(0.0029) ***	0.0717	(0.0029) ***	0.0694	(0.0029) ***	
d. On rural effect							
ln GDP per capita	-0.0190	(0.0096) *	-0.0188	(0.0098)	-0.0163	(0.0097)	
e. On minority effect							
Gini	-0.5951	(0.2973) *	-0.5519	(0.3206)	-0.4538	(0.2946)	
Control of Corruption	-0.0275	(0.0481)	-0.0286	(0.0492)	-0.0362	(0.0481)	
Political Rights	0.0532	(0.0212) *	0.0547	(0.0217) *	0.0485	(0.0215) *	
ln GDP per capita	-0.1004	(0.0346) **	-0.1011	(0.0346) **	-0.0900	(0.0344) **	
Ethnic Fractionalization	0.0772	(0.1295)	0.0825	(0.1343)	0.0894	(0.1280)	
<i>Variance Components for Model 1:</i>							
Intercept	0.3362	Unemployed	0.0160	Protestant	0.0908	Muslim	0.1139
Female	0.0118	Catholic	0.0629	Orthodox	0.0941	Other Religion	0.0544

Note: Sample size: 176,307 individuals, 80 countries. Standard errors are in parentheses.

\* p<.05, \*\* p<.01, \*\*\* p<.001

It should be noted that the level-1 coefficients vary substantially across countries. For example, the equation for “Female” slope is  $\beta_5 = -0.0455 + \varepsilon_5$ , where  $\varepsilon_5 \sim N(0, 0.0118)$ . Hence the plausible value range for Female slope is  $-0.0455 \pm 1.96 * (0.0118)^{0.5} = -0.0455 \pm 0.2129 = (-0.2584, 0.1674)$ .<sup>12</sup> This means that in some countries a typical female can be 4.6 percent less trusting than a typical male, while in other countries a typical female can be 3.3 percent more trusting than a typical male. Although females are significantly less trusting on average within the sample of 80 countries, there is substantial variation in the female effect across countries.<sup>13</sup> An important task of the multi-level analysis is to explain the variations in the level-1 intercept and slopes with level-2 variables.

We see that some level-2 variables have significant explanatory power for the level-1 intercept, or the log odds of trusting for a typical man. Income inequality (Gini) and control of corruption have significant effects on the probability of a typical man trusting others across countries, and political rights score has a significant non-linear effect, controlling for individual characteristics and per capita income and ethnic diversity. Although per capita income and ethnic diversity have significant simple correlations with social trust at the country level (See Table A1 in the Appendix), they are insignificant when inequality, corruption, and democracy are accounted for. Together these level-2 variables explain a considerable part (about 43 percent) of the variation in the level-1 intercept, or the probability of a typical man trusting others, across countries.<sup>14</sup>

The coefficient for GINI of -2.5165 means that the increase of gini by 0.1 (roughly equivalent to one standard deviation) would reduce the log odds of trusting for a typical male by -0.2516, which would result in the probability of trusting of  $1/\{1+\exp(1.0835+0.2516)\} = 0.2083$ . Thus, the probability of trusting for a typical man decreases by 4.5 percent as the gini coefficient increases by 0.1. Similarly, the increase of the Control of Corruption Indicator by 1 (equivalent to one standard deviation) would increase the probability of trusting for a

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<sup>12</sup> The corresponding plausible value range of probability of trusting for a typical female is from  $1/\{1+\exp(1.0835+0.2584)\} = 0.2072$  to  $1/\{1+\exp(1.0835-0.1674)\} = 0.2858$ .

<sup>13</sup> Running OLS regressions separately for each country gives a rough sense of how much variation exists for the coefficient for each level-1 variable across countries.

<sup>14</sup> The error term of equation 2 ( $\varepsilon_0$ ) has a variance of 0.3265 in model 1.  $\varepsilon_0$  has a variance of 0.5726 when level-1 intercept is not explained and just allowed to randomly vary across countries. Thus, model 1 explains  $(0.5726-0.3265)/0.5726 = 0.43$  of the variation.

typical man by 4.8 percent. Thus, both income inequality and corruption have substantively important negative effects on social trust, even after political rights, per capita income, and ethnic diversity as well as individual differences have been accounted for.

The effect of the political rights score (scale of 1 to 7) on social trust is negative up to the score of 4.1 (roughly equivalent to the mean political rights score), but positive for higher scores. Trust seems to decline with partial democratization, but increase with full democracy. When the political rights score was replaced by the “age of democracy” (consecutive years of democracy since 1950), the non-linear effect was also significant. Democracy seems to have a negative effect on social trust in the short run, but a positive effect in the long run, consistent with Uslander’s (2002) finding that democracy produces a positive effect only after 46 years of continuous democracy.

Variations in several level-1 slopes are partly explained by level-2 variables. Most importantly, the minority effect varies depending on income inequality, political rights, and per capita income. Being a minority in a typical country reduces the log odds of trusting by 0.2049, and the corresponding probability is 21.6 percent. Thus, the probability of trusting for a minority man is 3.7 percent lower than for a majority man on average in a typical country. However, as the gini increases by 0.1, the negative effect of being a member of a minority increases by 1 percent (from 3.7 percent to 4.7 percent). The negative effect of minority status is smaller in more equal societies and in countries with higher political rights scores, yet larger in countries with higher per capita income. The minority effect is not affected by corruption or ethnic diversity.

Although the level of economic development (per capita income) is insignificant for social trust on average across countries, it explains some of the variation in the income, education, and rural effects. The positive effect of income and education on trust is magnified in richer countries, but the positive rural effect decreases as per capita income increases. Variations in other level-1 coefficients were not well explained by level-2 variables.

Model 2 included the proportion of the Catholic population to explain the level-1 intercept. Although being a Catholic has no significant effect within countries (at level-1), the proportion of the Catholic population is significantly negatively associated with the level of social trust across countries (at level-2). Other religions are insignificant at level-2. Thus, the

proportion of the Protestant population does not make a difference across countries, although Protestants are significantly more trusting within countries. Inclusion of the Catholic population does not affect the significance of income inequality and democracy, but makes control of corruption insignificant.

Model 3 includes both the measure of skewness (ln mean/median ratio) and dispersion (ln 20/20 ratio) of income distribution to explain the level-1 intercept. The purpose is to see whether the inequality effect is primarily driven by skewness or dispersion. It turns out that the skewness effect is significantly negative even when dispersion is controlled for. This does not mean that income dispersion is insignificant for social trust, because the insignificance may be due to multicollinearity from the high correlation between skewness and dispersion ( $r=0.81$ ). Dispersion is also significantly negative when skewness is not included together. Recall my earlier argument that skewness of income distribution is unambiguously unfair, while certain levels of dispersion may be claimed to be fair. The negative effect of skewness is consistent with the prediction of the fairness explanation, but contrary to that of the similarity explanation.

Also, model 3 includes the political trust variable at level-1. Political trust (confidence in public institutions) is significantly positively associated with social trust, even after individual and country differences are accounted for. An increase of political trust by 1 (out of 1 to 4 scale) translates into an increase of trusting by 6 percent for a typical man, other things being equal. Thus, political trust and social trust are closely correlated at the individual level, consistent with Brehm and Rahn (1997), although the correlation may not be significant at the country level (Norris 2002).

**2) Further inspections and robustness checks:** It will be useful to look into the income effect in more detail, because the similarity and fairness explanations produced different predictions about it. The similarity explanation predicts people in the middle of the distribution should be most trusting, so there should be a non-linear effect of income on trust. However, the quadratic term was not significant, and social trust is found to increase almost monotonically with income.

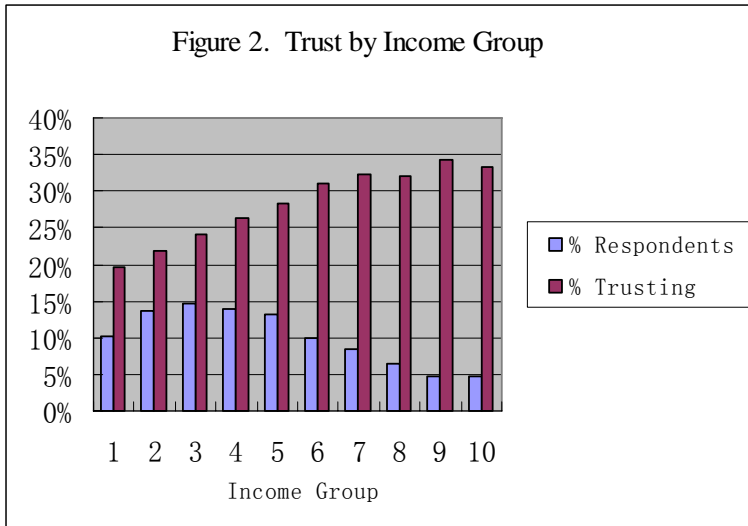


Figure 2 demonstrates that the distribution of income group and percentage of trusting people within each income group is uncorrelated. Although people who report they belong to the 9<sup>th</sup> and top income decile are relatively few and most other people are thought to have quite different levels of income, they are far more trusting than those people who subjectively belong to the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> income decile and are surrounded by a lot of people with similar level of income. The figure shows that the top income group is slightly less trusting than the 9<sup>th</sup> group, and this may reflect a little bit of heterogeneity effect. However, the difference is too small to be significant. Thus, the evidence favors the fairness hypothesis over the similarity hypothesis.

Although per capita income (average for 1971-96, in constant US dollars) is not significant with controls (Table 3), it has quite a high simple correlation with social trust at the country-level ( $r=0.38$ ). In order to detect a possible non-linear effect, I looked at the two-way scatter plot and included a quadratic term in the multi-level analysis. There was no significant non-linear relationship. Thus, relative income within countries matters, but average income level of a country does not matter, other things being equal.

The apparent insignificance of ethnic fractionalization (Fearon's measure) also requires further examination. Various measures of fractionalization such as Fearon's cultural fractionalization measure and Alesina et al.'s measures of ethnic, linguistic, and religious fractionalization were not significant in the multi-level analysis. According to Table A1 (in the Appendix), the simple correlation with mean social trust at the country level is significant

only for ethnic fractionalization (both Fearon's and Alesina et al.'s measures). Alesina et al.'s measures of linguistic and religious fractionalization are not significant, as Dehley and Newton (2004) also found. It is striking that Fearon's measure of cultural fractionalization, which incorporated cultural distance between ethnic groups, has no significant simple correlation with social trust. I further tested whether interaction terms between ethnic diversity and corruption or inequality were significant, but they were not.

The insignificance of ethnic fractionalization with controls does not necessarily mean that ethnic diversity has no effect on social trust. Ethnic diversity could affect social trust indirectly by increasing inequality and corruption. However, it is notable that both ethnic and cultural diversity lose significance once either corruption or inequality is accounted for.

Finally, I conducted a variety of other robustness checks to make sure that the findings from my multi-level analysis are not spurious. I ran the same models based on listwise deletion. I ran the same models separately for the 1995-97 and 1999-2001 data. I also experimented with more conventional methods such as logit regressions with both level-1 and level-2 data and OLS regressions at level-2. All these checks produced roughly consistent results.

**3) Predictors of political trust, norms and perceptions of trustworthiness:** Model 3 in Table 3 showed that political trust is strongly and significantly associated with social trust at the individual level. Inclusion of additional variables, such as the perceived extent of corruption, voluntary organizational membership, the belief that bribery can be justified, and the perception that the country is run by a few big interests, reduced the coefficient for political trust somewhat, but political trust was still very significant. Also, all these additional variables were highly significant with predicted signs. Thus, norms of trustworthiness (bribery justified) and perceptions of trustworthiness and fairness (perceived extent of corruption, run by big interests) somehow seem to be mediating variables between the fairness of a society (corruption and inequality) and social trust.

In order to test this interpretation, I conducted hierarchical analyses for correlates of political trust and norms and perceptions of trustworthiness. The results are presented in Table 4. A hierarchical linear model was used for the three dependent variables political trust, perceived extent of corruption, and "bribe justified," and a hierarchical logit model was

employed for the binary dependent variable, “run by big interests.”

**Table 4. Multi-level Results for Predictors of Political Trust, Norms, and Perceptions**

Dependent Variable:	Political Trust		Perceived Corruption		Bribe Justified		Run by Big Interests	
Linear/Logit Model:	Linear (Model 4)		Linear (Model 5)		Linear (Model 6)		Logit (Model 7)	
<i>Individual-level effects:</i>								
Intercept	2.3457 ***		2.8851 ***		1.9196 ***		0.7430 ***	
	(0.0256)		(0.0326)		(0.0667)		(0.0766)	
Age	-0.0034 **		0.0013		-0.0202 ***		0.0031	
	(0.0011)		(0.0014)		(0.0026)		(0.0021)	
Age squared	0.000070 ***		-0.000037 **		0.000107 ***		-0.000065 **	
	(0.000011)		(0.000014)		(0.000024)		(0.000024)	
Subjective Income	0.0017		-0.0080 **		0.0040		-0.0085	
	(0.0017)		(0.0027)		(0.0050)		(0.0077)	
Education	-0.0217 ***		-0.0193 **		-0.0375 ***		0.0454 ***	
	(0.0043)		(0.0069)		(0.0057)		(0.0053)	
Female	0.0048		0.0180 *		-0.1452 ***		-0.0114	
	(0.0073)		(0.0086)		(0.0150)		(0.0190)	
Unemployed	-0.0412 ***		0.0589 ***		0.1325 ***		-0.0436	
	(0.0099)		(0.0112)		(0.0232)		(0.0296)	
Rural	0.0737 ***		-0.0305		-0.0506 **		-0.0686 *	
	(0.0092)		(0.0204)		(0.0191)		(0.0314)	
Minority	0.0035		0.0492 *		0.0489		-0.0649	
	(0.0231)		(0.0196)		(0.0327)		(0.0647)	
Catholic	0.0885 ***		-0.0560 **		-0.0414		-0.0866	
	(0.0172)		(0.0175)		(0.0379)		(0.0456)	
Protestant	0.1210 ***		-0.0780 **		-0.1633 ***		-0.1243 **	
	(0.0191)		(0.0241)		(0.0360)		(0.0472)	
Orthodox	0.0608 **		0.0373		-0.1476 ***		0.1525 *	
	(0.0209)		(0.0314)		(0.0441)		(0.0772)	
Muslim	0.1595 ***		-0.0444		-0.1070		0.1905 **	
	(0.0340)		(0.0246)		(0.0669)		(0.0600)	
Other Religion	0.0701 ***		-0.0010		-0.1619 ***		-0.0407	
	(0.0154)		(0.0209)		(0.0343)		(0.0564)	
No Religion (Reference category)								
<i>Country-level effects:</i>	<b>On Intercept</b>	<b>On Minority</b>	<b>On Intercept</b>		<b>On Intercept</b>		<b>On Intercept</b>	
Control of Corruption	0.2932***	0.0564	-0.2889 ***		-0.2414 **		-0.6960 ***	
	(0.0491)	(0.0489)	(0.0435)		(0.0756)		(0.1340)	
Political Rights	0.0024	0.0256	0.0045		0.0069		0.0569	
	(0.0204)	(0.0156)	(0.0159)		(0.0324)		(0.0610)	
ln GDP per capita	-0.2449***	-0.1044*	0.0665 **		0.0754		0.3449 ***	
	(0.0341)	(0.0414)	(0.0256)		(0.0699)		(0.0868)	
Gini	-0.0206	-0.5761*	0.0151		0.3911		1.5259 *	
	(0.2382)	(0.2383)	(0.2230)		(0.5661)		(0.7559)	
Ethnic Fractionalization	-0.0457	-0.1071	0.0089		-0.0881		-0.0460	
	(0.1047)	(0.1106)	(0.0850)		(0.2211)		(0.2875)	

Note : Sample size: 176,307 individuals, 80 countries, except for perceived corruption (80,016 individuals, 50 countries). For perceived corruption, only the 1995-97 WVS data was used. Standard errors are in parentheses.

\* p<.05, \*\* p<.01, \*\*\* p<.001

Table 4 demonstrates that political trust is highly affected by corruption. According to model 4, a one standard deviation increase in the control of corruption indicator is associated with an 0.47 standard deviation increase in political trust (standard deviation = 0.63) for a typical man. Interestingly, per capita income is negatively associated with political trust. Income inequality is not significant for the level-1 intercept once corruption is controlled for. However, inequality has a negative effect on the minority's political trust. Minority people have no significantly different level of political trust from majority people on average, but political trust of minority groups is lower in more unequal countries.

Model 5 shows that, not surprisingly, the control of corruption indicator has a very high correlation with perception of corruption. The level of economic development is associated with higher perception of corruption when the control of corruption indicator is accounted for, although it has a negative simple correlation with perceived corruption. The belief that bribery can be justified is significantly higher in more corrupt countries (model 6), and the perception that the country is run by a few big interests is significantly higher in more corrupt and unequal societies (model 7). All these findings support the hypothesis that fairness of social and political institutions, in particular corruption and income inequality, affect the norms and perceptions of trustworthiness, and thereby social trust. But as Table 4 shows, ethnic diversity has no significant effect on political trust or norms and perceptions of trustworthiness controlling for other factors.

**4) Possibility of reverse causation:** So far, out of the eight pairs of competing hypotheses in Table 2 that were tested empirically, the results for seven pairs (except hypothesis-pair 3) support the fairness explanation and none supports the similarity explanation. For hypothesis-pair 3, I could not find direct evidence for an interaction effect between ethnic diversity and fairness (corruption or inequality), but the significant interaction effect between minority effect and fairness (inequality or democracy) indirectly supports the former hypothesis.

Although fairness has strong explanatory power using a variety of empirical tests, I have not established the causal direction. In order to establish the direction of causality and obtain unbiased estimates of the effects of income inequality, democracy, and corruption on social trust, we need to have either a long period of panel data or good instruments for these

endogenous variables. Since neither adequate longitudinal data<sup>15</sup> nor convincing instrumental variables are available, I tested multiple implications of the competing theories to see which theory best fits the data.

Social trust is likely to affect corruption and inequality, because non-trusting people are less likely to stick to the rules of the game and societies with higher social trust may find it easier to reach consensus on extensive redistribution. Indeed, the social trust variable is significant across countries in both corruption regression and inequality regression, as Table A2 in the Appendix indicates. Although these OLS regressions do not establish causal direction, it is unlikely that the statistically significant and substantively large coefficients for social trust in these regressions purely reflect reverse causation.

Corruption, inequality, and social trust are all likely to have considerable measurement error. Measurement error will bias the coefficients for corruption and inequality toward zero in the social trust regressions, and the coefficient for social trust will also be underestimated in the corruption regression and inequality regression. Although reverse causality will cause them to be overestimated, the simultaneity bias (due to reverse causation) and the attenuation bias (due to measurement error) tend to offset each other. We cannot know which bias is larger, but their offsetting effects will reduce the net bias in the coefficients.

Although it is very difficult to sort out this “chicken-and-egg” problem, it seems that causation runs both ways from corruption and inequality to erosion of trust and from lack of social trust to corruption and inequality. Thus, countries may be trapped in vicious circles of inequality, corruption, and distrust or they may proceed along virtuous circles of equality, freedom from corruption, and trust.

## **VII. CONCLUSIONS AND IMPLICATIONS**

I have argued that the fairness of political and legal institutions and of social conditions affects incentives for trustworthy behavior, social norms regarding such behavior, and people’s propensity to trust. In particular, three kinds of fairness matter: formal justice

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<sup>15</sup> Uslaner (2004) conducted longitudinal analysis about the causal relationship between corruption and social trust. However, social trust as well as corruption tends to change little over time within countries, while they vary enormously across countries. So, the change in social trust and corruption in his data may reflect the noise rather than the true change.

(freedom from corruption and equal treatment before the law), procedural justice (democracy and equal political rights), and distributive justice (a relatively equal and unskewed distribution of income). I suggested that the negative effect of income inequality on social trust may be due to people's sense of unfairness rather than to differences in income among people. I also suggested the negative effect of ethnic and cultural diversity on social trust may depend on the fairness/unfairness of ethnic relations and the society.

Based on multi-level analysis, using the WVS/EVS data (1995-97 and 1999-2001) and various country indicators, I find that freedom from corruption (formal justice), income equality (distributive justice), and full and mature democracy as political equality (procedural justice) are significantly positively associated with social trust across countries, while the level of economic development (per capita income) and ethnic/cultural fractionalization are insignificant controlling for corruption and inequality. Also, I find evidence that corruption and inequality have an adverse impact on norms and perceptions of trustworthiness as well as political trust and that these norms, perceptions, and political trust affect social trust.

In the economic realm, what matters for social trust is the distribution of income rather than the average income of the people in the country. Although individuals' relative income is significantly positively associated with their propensity to trust, per capita income of the country one lives in has no significant effect controlling for other country characteristics.

Higher-income is associated with higher trust, and people with middle-level income are no more trusting than rich people, contrary to the prediction of the similarity hypothesis but consistent with the fairness hypothesis. The negative effect of inequality on trust is more related to skewedness (unfairness) than to dispersion (heterogeneity) of income. These findings also support the fairness/unfairness explanation rather than the "aversion to heterogeneity" explanation based on similarity/dissimilarity of incomes among people.

Although ethnic and cultural diversity is significant for social trust without controls, it is insignificant once corruption or inequality is accounted for. Also, the negative effect of minority status is greater in more unequal and undemocratic countries. This finding suggests that (perceptions of) the fairness/unfairness of ethnic relations in the whole society is more important for social trust than the degree of ethnic diversity. Alesina and La Ferrara's (2002) finding that ethnic fractionalization is not significant while racial fractionalization is highly

significant in the US may be explained by the different degrees of perceived fairness/unfairness in Black-White racial relations and other ethnic relations.

The policy implications of these findings are important. We need to be concerned about income distribution, in particular the skewedness of the distribution, and not just economic growth. Indeed, improving the distribution of income may also contribute to economic growth in the long run via enhanced social trust (Zak and Knack 2001). Removing racial and ethnic discrimination, reducing income inequality between races and ethnicities, and encouraging political participation of minority groups may have positive effects on social trust in the long run. We cannot deny that ethnic and cultural diversity poses a significant challenge in terms of social trust and economic and political solidarity. But my findings suggest that the challenges of diversity are not insurmountable and that building a fair society, or reducing corruption and inequality, is much more important than sustaining a homogeneous society.

Although I was unable to sort out the “chicken-and-egg” problem, it seems likely that causation runs both ways from corruption and inequality to erosion of trust and from social distrust to corruption and inequality. The problem is then how to reverse the vicious circles of “high inequality, high corruption, and low trust” in which many countries are trapped. This requires further research including in-depth case studies about the role of democracy, political institutions, and social policy.

## Appendix

**Table A1. Descriptive Statistics and Simple Correlations with Social Trust**

Variable	Obs	Mean	Std. Dev.	Min	Max	Correlation with Trust	
<i>Individual Characteristics:</i>							
Social Trust	169334	0.265	0.442	0	1	1	
Political Trust	169386	2.421	0.655	1	4	0.090	***
Perceived Corruption	66447	2.904	0.833	1	4	-0.139	***
Bribe Justified	166233	1.708	1.689	1	10	-0.030	***
Run by Big Interests	114173	0.699	0.459	0	1	-0.073	***
Voluntary Membership	75682	0.000	0.000	0	9	0.081	***
Subjective Income	149823	4.643	2.538	1	10	0.100	***
Education	169575	3.163	1.525	1	6	0.066	***
Female	176215	0.519	0.500	0	1	-0.012	***
Age	167146	41.126	16.243	15	101	0.028	***
Unemployed	169434	0.095	0.293	0	1	-0.042	***
Rural Residence	139470	0.345	0.475	0	1	0.015	***
Minority	87253	0.135	0.342	0	1	-0.042	***
Catholic	170489	0.327	0.469	0	1	-0.073	***
Protestant	170489	0.128	0.334	0	1	0.076	***
Orthodox	170489	0.116	0.321	0	1	-0.033	***
Muslim	170489	0.142	0.350	0	1	0.006	*
Other Religion	170489	0.086	0.281	0	1	0.017	***
No Religion	170489	0.200	0.400	0	1	0.031	***
Optimism	58508	0.527	0.499	0	1	0.104	***
Sense of control	161556	6.605	2.526	1	10	0.042	***
<i>Country Characteristics:</i>							
Mean Social Trust	80	0.284	0.145	0.047	0.653	1	
Gini	73	0.340	0.099	0.173	0.588	-0.361	***
ln (mean/median)	70	0.236	0.164	0.051	0.762	-0.507	***
ln (20/20 ratio)	70	1.911	0.529	1.076	3.304	-0.342	***
Control of Corruption	80	0.419	1.076	-1.062	2.329	0.506	***
Political Rights	80	4.326	1.985	1.080	7	0.355	**
ln (GDP per capita)	80	8.149	1.469	5.201	10.615	0.376	**
(Fearon's measures of diversity)							
Ethnic Fractionalization	76	0.376	0.238	0.004	0.953	-0.2649	*
Cultural Fractionalization	76	0.240	0.179	0.000	0.667	-0.0547	
(Alesina et al.'s measures of diversity)							
Ethnic Fractionalization	79	0.354	0.232	0.002	0.930	-0.2846	*
Linguistic Fractionalization	79	0.317	0.265	0.002	0.923	-0.0878	
Religious Fractionalization	80	0.428	0.229	0.004	0.860	0.0319	

\* p<.05, \*\* p<.01, \*\*\* p<.001

Note : The maximum of correlation of individual-level variables with social trust (dummy) is not 1, while that of country-level variables with mean social trust (continuous variable) is 1.

Table A2. The effects of social trust on inequality and corruption at country-level (OLS results)

Dependent variable:	Gini (1990s)				CPI (1996-2002)			
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Independent variables								
Social trust	-25.8790	-2.51			2.6611	1.94		
CPI (96-98)	-1.2250	-1.91	-1.6880	-2.64				
Gini (71-96)					-0.0335	-2.3	-0.0405	-3.08
ln GDPpc (71-96)	-0.7857	-0.71	-0.6545	-0.57	0.8753	4.79	0.8373	4.61
Pol rights (72-96)	-0.6782	-0.69	-0.9017	-0.87	0.0015	0.01	0.0260	0.18
Trade/GDP (1971-96)	-2.2423	-1.27	-1.5428	-0.79	0.3365	1.16	0.4036	1.43
Percentage Protestant	0.2269	3.72	0.2160	3.47	0.0253	2.52	0.0279	2.82
French legal origin	0.6309	0.29	0.5069	0.22	-0.7001	-2.5	-0.7551	-2.6
Socialist legal origin	-11.1863	-3.06	-13.5655	-4.22	-1.8426	-2.91	-2.0129	-3.29
German legal origin	-5.6808	-1.6	-10.1997	-3.11	-1.4481	-2.56	-1.2830	-2.22
Scandinavian origin	-11.8716	-1.97	-19.1240	-3.44	-1.2218	-1.43	-0.7399	-0.8
Federalism	0.3223	0.11	-1.5765	-0.5	0.0235	0.07	0.0264	0.08
Natural resource exports	-0.0093	-0.58	-0.0035	-0.23	-0.0064	-1	-0.0070	-1.11
Ethnolinguistic fractionalization	0.8723	0.18	1.0087	0.21	-0.9020	-1.25	-0.9329	-1.23
Constant	66.2163	6.71	60.9812	6.16	-2.3108	-1.31	-1.3408	-0.73
N	114		114		102		102	
R2	0.5590		0.5292		0.8275		0.8190	

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