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Do Positional Concerns Destroy Social Capital: Evidence from 26 Countries.

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Abstract:

Research on the effects of positional concerns on individuals' attitudes and behavior is sorely lacking. To address this deficiency, we use the International Social Survey Programme 1998 data on 25'000 individuals from 26 countries to investigate the impact of relative income position on three facets of social capital, covering horizontal and vertical trust as well as norm compliance. Testing relative deprivation theory, we identify a deleterious positional income effect for persons below the reference income, particularly for their social trust and confidence in secular institutions. Also often a social capital-lowering effect of relative income advantage occurs, while a rise in absolute income almost always contributes positively. These results indicate that a rise in income inequality in society too large is rather detrimental to the formation of social capital.

JEL Classification: Z130, I300, D310

Keywords: Relative income, positional concerns, social capital, social norms, deprivation theory

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I. INTRODUCTION

Concern about relative position is a "deep-rooted and ineradicable element in human nature" (Frank 1999, p. 145), the social repercussions of which have long preoccupied human secular self-reflection and contemplation.[1] In economic theory, Adam Smith (1759/1976), like his successors Karl Marx (1849) and Thorstein Veblen (1899), emphasized the importance of relative position and social concerns. Modern economists such as Arthur Pigou (1920), John Maynard Keynes (1930), James Duesenberry (1949) and Harvey Leibenstein (1950) have since elaborated on these ideas, incorporating them into their own analyses. In contrast to the position of traditional standard utility theory, (which advances the notion that individuals evaluate their welfare only in absolute terms), the theory of positional concerns assumes that individual welfare depends on comparisons with others. It is therefore surprising that many economists have largely neglected this aspect.

In particular, there is a dearth of empirical research into the impact of relative income position on individual attitudes and behavior (see Senik, 2004). Moreover, of the existing studies on the effect of relative income position, most focus on its association with happiness rather than its impact on social capital (e.g., Clark and Oswald, 1996; Ferrer-i-Carbonell, 2005; Luttmer, 2005; Dorn et al., 2007; Senik, 2004, 2008). The first attempt at analyzing relative income effects presented the results for 4 measures of social capital only (Fischer and Torgler, 2006a). The current paper extends on that previous work, including three broad facets of social capital (horizontal trust, vertical trust and social norm compliance) and employing a more sophisticated methodology.[2]

The question of the determinants of social capital, in particular its income-related determinants, has recently come to the attention of economists. Not since long have economists 'discovered' social capital – widely studied and highly prominent in all social sciences – and found it to be of importance for economic phenomena like macroeconomic

performance. For example, arguing with its private transaction-cost lowering nature, Knack and Keefer (1997), in a cross-sectional analysis, find a strong and significantly positive relationship between social capital variables and economic growth. Schaltegger and Torgler (2007) use a synthetic panel of Swiss cantons (1981–2001) and show that trust in government enhances fiscal performance. Regarding public finance, Slemrod (1998) argues that social capital – measured as the willingness to pay taxes voluntarily – lowers the costs of government operations and of equitably assigning such costs to citizens. Such research justifies a closer look at what shapes social capital.

To remedy the void in the research on relative income effects for social capital, this paper contributes to the recent discussion in two important aspects: first, by employing different measures of social capital we aim not only to produce detailed evidence on the impact of positional concerns on social capital formation, but also to reflect three different dimensions of social capital: generalized trust (horizontal trust), confidence in institutions (vertical trust), and compliance with social norms, In addition, our study overcomes some methodological shortcomings by using survey data from the 1998 wave (RELIGION II) of the International Social Survey Programme (ISSP), which covers approximately 25'000 persons in *26* countries. Moreover, in line with some previous studies, we include a comprehensive set of control variables to better isolate partial correlations between relative income position and social capital (see Appendix Table A1).

In developing the theoretical point of view, we are going to formulate our hypotheses based on the relative deprivation theory. Clark and Oswald (1996) point out that "the lack of empirical evidence, except of what most economists view as of a circumstantial nature, has kept relative deprivation theory on the periphery of research in economics" (p. 360). However, we are aware that it is possible to explore alternative theories such as ambition, hope, tolerance or gratification (see, e.g., Senik 2004, 2008).

The remainder of the paper is organized as follows. Section II develops the theoretical approach and predictions. Section III describes the dataset, and Section IV presents the empirical results. Section V concludes the paper.

II. THE EFFECT OF RELATIVE INCOME POSITION ON SOCIAL CAPITAL

1. The Role of Relative Income Position in Society.

In real life, it appears commonplace for individuals to make relative judgments regarding their own positions (for an overview, see Frank and Sunstein, 2001). More specifically, people tend to compare themselves with others in their social environment and care a great deal about their relative position in society, which in turn may influence their attitudes and observable behaviour. In social science theory, social comparisons were historically thought to play a role in the interaction between people, as many economic and social phenomena might be explained by the interdependence of individuals' utilities.

Since Kant's (1785/1964) early contribution on the importance of social comparisons, social psychology, sociology and anthropology have traditionally emphasized the fundamental significance of *relative preferences* to human motivation (see, e.g., Festinger, 1954 for the theory of social comparison; Stouffer, 1949 for the theory of relative deprivation). In addition, a minority of economists have elaborated on the concept of interdependent preferences, whose inclusion in economic theory allows social comparisons[3]. However, as McAdams (1992) points out, although social scientists have at least challenged the concept of selfishness by assuming positively dependent preferences leading to empathy and altruism, they have nevertheless neglected the aspect of positional concerns: "Much less

has been said about the extent to which preferences are negatively interdependent, and the economic consequences of such preferences" (p. 3).

2. Relative Deprivation, Envy and the Impact on Social Capital.

Relative deprivation theory investigates interpersonal and inter-group relations and social comparisons. The theory stresses that a lower perception of one's own (group) status or one's own welfare in relation to another person (group) can be the source of hostility towards the other individuals or groups. A person may feel deprived and get frustrated when his/her situation (e.g., individual earnings) falls relative to the reference group. If improvement of the situation is slower than expected, the experience of frustration can even cause aggressive behavior (see, e.g., Walker and Pettgrew, 1984). The term relative deprivation is used to refer to the negative feelings that arise from having less than other people (López Turley, 2002).[4]

Deprivation theory is strongly linked to the literature on envy and positional concerns. The German social scientist Helmut Schoeck (1966) amply demonstrates that positional concerns are a widespread social phenomenon engendering a myriad of everyday actions aimed at reducing relative deprivation. For example, school uniforms are thought to reduce possible envy among pupils. For the same reason, schoolteachers may ask parents to refrain from packing special treats in their children's lunchboxes (Elster, 1991). An extreme example occurred in China during the Cultural Revolution when farmers owning fruit trees were ordered to cut them down (Zhang and Sang, 1987, cited in Elster, 1991). Thus, positional concerns may translate into envy and feelings of deprivation, when the individual's current situation is below her own aspiration level. Several economists, primarily in 1970s literature on welfare economics, also discuss the significance of envy (e.g., Foley, 1967; Brennan, 1973; Varian, 1974; Archibald and Donaldson, 1979; Mui 1995). More recently, experimental economists have discovered the relevance of incorporating positional concerns to explain

outcomes of ultimatum games in which participants have to agree on how to divide a 'pie' (see, e.g., Kirchsteiger, 1994; Frank and Sunstein, 2001.)

3. Derivation of Hypotheses.

Deprivation theory based on social comparison may help construct an argument as to how individual positional concerns may affect various dimensions of social capital. Indeed, López Turley (2002) has shown that relative deprivation may have negative effects not only on psychological well-being as well as on physical health, but also on pro-social behavior. In this paper, we conjecture that individuals' contributions to social capital in their society may well be such an affected behavioral outcome.

3.1. Social trust

Turning to the first facet of social capital, we hypothesize that individuals' positional concerns may affect her level of generalized trust – to what extent she trusts other people in general. Most particularly, disadvantages in the relative income position are linked with frustration ("it *could* have or *should* have been me"), unhappiness and resignation of not being able to 'keep up with the Joneses'. Possibly, feelings of frustration might be caused by the impression of being economically exploited by those who are better off in society, particularly when individuals believe that the income distribution was the outcome of an unequal distribution of power between economic agents rather than the result of market forces under perfect competition. Bjørnskov et al. (2010) reveal empirically for a world sample that income inequality in society is more easily borne when people's perception of a fair society coincides with the degree of actual social mobility, which is not the case in the reverse case of a mismatch between expectations and reality, leading to disappointment effects. Fischer (2008) shows that market competition is social trust-increasing for those with an income above the median level, but exerts no effect on those with a low income. Thus, in other words,

feelings of exploitation and deprivation might arise if societal wealth was unequally distributed among its producers in an unfair manner. As a consequence, such feelings of relative deprivation may lead not only to distrust of the Joneses (i.e., the reference group) but also of other citizens, which reduces generalized trust. Based on these thoughts, we can develop the following hypothesis:

Hypothesis 1:

Positional concerns decrease people's trust in others, i.e., feelings of relative deprivation may lead not only to distrust of the Joneses (reference group) but also other citizens, reducing people's generalized trust.

3.2. Vertical trust

In addition, relative deprivation may also lead to the experience of discontent toward the structure of a society (Canache, 1996). More specifically, individuals may blame the state or its institutions for generating an unfair distribution of the societal wealth pie and, consequently, the relative income disadvantage they experience compared to the Joneses. Thus, frustration and feelings of exploitation may lead not only to a decrease in trust at the horizontal level (generalized trust) but also at the vertical level; that is, the relation between the individual and her government or other institutions that govern society. The degree to which these social institutions are held responsible by individuals for their current social position may depend on the perceived degree to which these institutions influence societal outcomes and, implicitly, shape individuals' choice set. For example, the national parliament is linked to the current politico-economic level, while the courts and the legal system are linked to the constitutional level. Owing to stronger long-term effects (blaming the 'rules of the game'), we may expect a stronger impact of positional concerns on confidence in institutions at the constitutional level. On the other hand, short-term and unexpected policy changes are more prominent among the law-making bodies, where previous decisions are

overruled faster and new governments occur more often. The influence of these institutions at the current politico-economic level might be particularly strong given that people have adjusted their aspiration levels to the long-term determinants of their social position. Thus, we are not able to make an *a priori* statement for which type of government institution positional concerns should be more pronounced.

Moreover, because positional concerns are widely present in the workplace (see, e.g., Elster, 1991; Frank and Sunstein, 2001), we may also see an impact on individuals' confidence in the environment of business and industry in which they are involved daily. In other words, individuals may blame the economic sector for their relative income disadvantage, which could lead to a decreased level of trust in that social sector. On the other hand, vertical trust increases if individuals have an advantage in relative income. This leads to the next hypothesis:

Hypothesis 2:

The disadvantageous relative income position is detrimental to individuals' trust in secular institutions such as the courts, parliament and business and industry.

3.3. Norm compliance

Sociological research has observed a causal link between relative deprivation and social protest, and illegal activities such as violent crime, property crime, and drug use (Canache, 1996; Stiles, Liu, and Kaplan, 2000). Negative self-feelings, frustration and aggression that are induced through feelings of deprivation motivate individuals to restore self-esteem through illegal activities - there is evidence that financial dissatisfaction lowers the level of tax morale (Torgler, 2006). Based on survey data for 30 European countries, Frey and Torgler (2007) reveal that taxpayers act upon their beliefs about the compliance behavior of other taxpayers. Thus, interpersonal comparisons may also have an impact on individual's willingness to pay taxes (tax morale). We conclude that a relative income disadvantage may

create distress over the discrepancy between the actual and the aspired-to financial situation, lowering sense of civic duty of tax honesty. In such a scenario, the socially and economically deprived may choose means for an 'illegal' and retaliating income redistribution, by cheating the government not only by not paying taxes, but also by claiming unjustified government benefits.[5]

Benefit morale and tax morale as civic duties are expressions of the quality of the relation between the citizen and her government that acts as tax-collecting and income redistributing agency. The civic duty of norm compliance, however, does also exist in the sphere of criminal law, where the government prosecutes and punishes infringements of other citizens. The successful prosecution of such criminals is not possible without citizens' cooperation through e.g. serving as truthful witnesses. However, as we argued above, frustration and social grievances may well result in own illegal activities or the protection of friends' criminal activities. Consequently, we expect the disadvantage in relative income position to negatively affect social capital also in its dimension of general law compliance as form of cooperation with the government. Thus, we can also formulate the following hypothesis:

Hypothesis 3:

Relative income concerns are deleterious to individuals' willingness to obey the law and comply with social and legal norms.

3.4. Confidence in religious institutions

However, even though differences in income may lead to positional concerns, there may be instances in which the creation of social capital is not negatively affected. For example, religious institutions provide moral constitutions for a society and as a type of 'supernatural police' that re-enforces compliance with socially accepted rules (Anderson and Tollison, 1992). Equally, it encourages the production of social goods such as moral behavior rooted in,

for example, the Ten Commandments (Hull and Bold, 1994). More specifically, in the interest of social peace, religions control and restrain positional concerns not only by potentially building up hope and tolerance (see below), but more so through a sanctioning system that reinforces social values, providing support for toleration of inequality and legitimizing noticeable differences in individual socio-economic position. Fundamentally, all world religions teach the avoidance of envy; for example, according to Jewish tradition, causing others to feel ashamed and creating envy through one's own behavior is unlawful. Similarly, in the *Qur'an*, Mohammed describes envy as a sickness and the "shearer of religion". Buddhism regards envy as one of the so-called five poisons that may lead to continuous re-birth and must therefore be overcome. In Hinduism, the avoidance of envy is a *yama*, an advised restraint, which should be followed. Regarding Christianity, Schoeck (1966) points out that "in the West, the historical achievement of this Christian ethic is to have encouraged and protected […] the exercise of human creative powers through the control of envy" (pp. 159-160). Thus, we can therefore expect that positional concerns may not affect people's trust in churches and religious organizations because these institutions provide mechanisms for cauterizing the feeling of envy. These observations lead to the following hypothesis:

Hypothesis 4:

Trust in churches and religious organizations should not be affected by relative income concerns.

III. DATA

This analysis uses a cross-section of individual data from the 1998 ISSP survey, which contains various questions about individual 'contributions' to the formation of (aggregate) social capital related to three dimensions – trust between people, people's trust in social

institutions, and compliance with norms. The ISSP survey is a program of cross-national collaboration on representative surveys covering a wide range of topics for social science research; it covers approximately 25'000 individuals from 26 countries. As the survey is conducted in several countries, comparative data on values and belief systems among people of different cultural backgrounds can be investigated – a facet we exploit in our empirical robustness test. Inclusion of a large number of countries in a multivariate cross-national analysis allows us to observe culturally and socially independent tendencies. Instead, previous available literature based on individual-level data has only investigated only one type of social capital in one single country (Ferrer-i-Carbonell, 2005).

The notion of social capital employed in this study encompasses multiple aspects. In this paper, based on the classical definition of social capital by Putnam 1993, p.167, we distinguish its multiple facets along three different dimensions: trust between people (horizontal trust/social trust), confidence in secular and religious institutions (vertical trust), and compliance with social norms.[6] However both trust among people, and the people's trust in national institutions are often viewed as two facets of one dimension (see, e.g., Glaeser et al., 2000; Knack, 2000; Uslaner, 2002).

The first dimension of social capital, generalized trust - the belief that "most people" can be trusted - does not depend on trusting "specific groups" (see, e.g., Fischer, 2008); thus, it is generalized trust, not particularized trust. In line with the literature, we measure generalized trust using the following question: "Generally speaking, would you say that people can be trusted or that you cannot be too careful in dealing with people?". Whereas generalized trust reflects the horizontal relation between citizens, trust in (state) institutions is a key factor in measuring the vertical interaction between citizens and the state or other organizations. Thus, in a further step, we also include four questions that relate to the second dimension of social capital – such as "How much confidence do you have in institution X?" – to test several facets of vertical trust. The secular institutions to be analyzed are the

parliament, the courts and legal system, businesses and industries (the economic sector); other societal institutions include the church and religious organizations.

The third dimension of social capital - compliance with social norms - is measured using questions related to tax morale, government benefit morale and compliance with legal norms. Because traditional economic models of tax evasion predict far too much infringement, tax honesty seemingly depends on numerous factors that go beyond standard economic concepts like deterrence. To resolve this conundrum, many researchers suggest that the intrinsic motivation for individuals to pay taxes – termed in the literature as 'tax morale' – helps explain these high levels of tax compliance (for an overview, see Torgler, 2007). In line with previous empirical research we assess individual's level of tax morale using the following question: "Do you feel it is wrong or not wrong if a taxpayer does not report all of his or her income in order to pay less income tax?" The benefit morale (see e.g. Halla and Schneider, 2005), the acceptance of the practice of claiming government benefits without being entitled to them, is investigated in a similar manner. Compliance with legal norms like criminal and traffic laws is measured by the following moral dilemma: "Suppose you were riding in a car driven by a close friend. You know he is going too fast. He hits a pedestrian. He asks you to tell the police that he was obeying the speed limit." Thus, our social and legal norm compliance measures are proxies for different ethical questions and civic duties in daily life.

All eight categorical social capital variables have been recoded so that higher values correspond to higher levels of individuals' social capital (i.e. individual contributions to the amount of social capital in society). It is important to our analysis to note that this dataset provides precise information on personal income measured continuously in monetary units, on which we base our relative deprivation variables. Moreover, this data set allows us to control for a wide array of additional socio-demographic factors usually employed in multivariate analyses of well-being issues such as tax morale or life satisfaction (see, e.g.,

Fischer and Sousa-Poza, 2008; Torgler, 2007). To ensure disposable income is comparable across persons, equivalent income is calculated based on the modified OECD equivalence scale (Van Doorslaer and Masseria, 2004).[7] The benchmark income, measured by the national median income, is computed as the median of the personal equivalence income observed in one country. Using the median income of the reference group seems intuitively appealing for investigating social comparison effects, particularly in countries in which the income distribution is strongly skewed.[8] Income distances are calculated as the difference between an individual's (equivalent) income and the reference group (equivalent) income. Cross-country comparability of relative income is then achieved by dividing these income distances by their country-specific median incomes, expressing relative income in terms of share of the median income (see also Section IV).[9]

Descriptive statistics for these variables are reported in Tables A1 and A2 of the Appendix. Taking a look at (absolute) income differences, means and standard deviations are smaller for incomes below the national median than for those above. The descriptive statistics in Table A1 also show that there are as many men as women in our sample, and reports that individuals below 50 years and married persons form the majority groups in our sample. Moreover, although the average educational level is quite high, a strong variation is observed. Regarding denominations, most interviewees are either Protestants, Catholics, or are not part of a particular religious denomination. In our sample, more interviewees live in urban areas, and the majority is either employed, or, to a lesser extent, retired.[10]

IV. MODEL AND METHODOLOGY

To operationalize the theoretical part for empirical research it is necessary to define an appropriate proxy for social comparisons, our focal predictor of the emergence of social capital. As economists, we recognize the central role of individual's income in determining

one's social position in relation to her peers, as it is income that constitutes the financial constraint on an individual's consumption possibilities. Although appealing as a theoretical construct, an individual's aspiration income is not directly observable in this survey. However, following the approach taken by recent empirical happiness research, we believe that aspiration income can be approximated by employing the concept of observable reference income that we define as the median income of the reference group (e.g. Dorn et al, 2008; Ferrer-i-Carbonell, 2005; Clark and Oswald, 1996)[11]. In other words, we believe that the measure 'relative income distances' allows investigation into the implications of relative income position on social capital. Any relative income position can be either of an advantageous type, namely a position beyond the reference income, or of a disadvantageous type, leading to so-called positional concerns.

In this cross-sectional model (which is simplified here), we regard the individual *i*'s self-reported contribution to social capital in country *s* (Y_{is}) as a function of the relative income position of that individual in country *s* (Z_{is}) and a vector of additional individual control variables (V_{is}) that also includes absolute income. National fixed effects (F_s) and an error term (ε_{is}) complete this model.

$$Y_{is} = \beta_1 Z_{is} + \beta_2 V_{is} + F_s + \varepsilon_{is} \qquad (1)$$

Our variable of interest, relative income position (Z_{is}), is measured as the difference between an individual's (equivalent) income and the reference group (equivalent) income, defined as the median income in each country sample, standardized across countries by dividing through the median income.

In order to separate the effect of relative income from that of the absolute income, vector V_{is} also includes a measure of absolute income.[12] Following previous empirical research on the effect of relative income for happiness as in Ferrer-i-Carbonell (2005), we

assume decreasing marginal utility of absolute income, which we express using the log-form, in line with the known behavioral economics literature (e.g. Clark and Oswald, 1996). Inclusion of a squared term allows for some flexibility with respect to the functional relation between the social capital variable and absolute income. In the case of absolute income, cross-country comparability is ensured by taking the log, with the country fixed effects then picking up international differences in purchasing power. Notably, absolute income serves only as a necessary controlling variable and therefore the magnitude of its effect is only of little interest.

The total and partial correlations between the absolute income measures and the relative income measures are so low that we can exclude the possibility that relative income just picks up an absolute income effect, or that a statistical identification of their separate effects was not possible total (partial) correlation between absolute income and negative/positive income distance are -0.18 and 0.03 (-0.08 and 0.005), respectively).[13]

To ensure comparability of the estimation results, computation for the various dimensions of social capital employs the identical set of control variables at the individual level (V_{is}). This vector of control variables (V_{is}) is based on previous empirical literature on life satisfaction or social capital (e.g., Dorn et al., 2007; Torgler, 2007). It includes gender, age, education, occupational status, marital status, religious denominations, religiosity, and a dummy for living in an urbanized area. Tables A1 and A2 in the Appendix provide a complete list of the dependent variables and the determinants.

Important, but often neglected, control variables at the aggregate level are the country's cultural background, norms and institutions as well as its overall economic situation, that might be correlated with individual-level characteristics, (particularly income situation), and equally influence the creation of social capital. The effects of these national characteristics are not directly counted for in the model, but are captured by country fixed effects (F_s), which also 'absorb' the reference group's income level.

Given the categorical nature of our dependent variable, equation (1) is estimated with a weighted ordered probit estimation method; application of weights makes the estimation results representative for the corresponding national population.[14] In addition, because the estimated coefficient only indicates the direction of an effect and not its magnitude, we also compute (total) marginal effects for reporting the highest level of social capital. For each regression outcome we report the McFadden R2 that ranges between 0 and 1.[15]

It can be argued that interpersonal income comparisons are *asymmetric* (Duesenberry, 1949; Holländer, 2001; Frank, 1985), explicitly modeled in, e.g., Fehr and Schmidt (1999). Methodologically, the possibility of an asymmetric effect is taken into account through differentiating between the impact for 'poorer' persons and the influence for 'richer' persons, similarly to the approach taken by Ferrer-i-Carbonell (2005, p.1004).[16] Moreover, we might expect a decreasing marginal utility of income for richer, but not poorer, individuals, which we take into account by including the squared terms of the income differences. Thus, the vector Z_{is} contains the following relative income variables:

'negative income distance' = $(y_s - y_{is})/ y_s$, if $y_{is} < y_s$ and 0 otherwise,

'positive income distance'-squared = 'positive income distance'^2

'positive income distance' = $(y_{is} - y_s)/ y_s$ if $y_{is} \geq y_s$, and 0 otherwise,

'negative income distance'-squared = 'negative income distance'^2.

Econometrically, this model specification has the advantage that it assumes a more flexible functional form of the relation between relative income and social capital, in contrast to when one assumes a linear or log-linear form, as often encountered in happiness studies (e.g. Ferrer-i-Carbonell, 2005). In this specification, the model allows for both a linear as well as a quadratic relation (in the first case, the coefficient on the quadratic term would simply appear as insignificant). High correlation between the relative income variable and its squared term (rho = 0.8 and higher), however, might disguise a truly decisive impact of any of them. Wald-

tests of the joint significance of the income distance and its squared term aim to distinguish these cases from those where they exert, both individually and jointly, an insignificant impact.[17] The test statistics are included in the bottom line of the output tables.

Due to the cross-sectional nature of our data, reversed causality and measurement error might bias the estimated coefficients. In particular, social capital might influence an individual's earnings and therefore potentially her relative income position. Knack and Keefer (1997), for example, provide evidence at the macro level that trust may affect growth. Moreover, other omitted factors might drive both professional career and the perception of social capital in society.[18] However, happiness panel studies with individual fixed effects (controlling for unobserved individual heterogeneity) found only small effects of reversed causality (at least not affecting the direction of the positive income effect). Fischer (2008) reports in her cross-sectional study on generalized trust only negligibly small biases, using the richer World Values Survey dataset, which includes suitable instruments for income. As is the case in many other cross-sectional studies using individual data, the small ISSP data provides only little exogenous variables for an instrumental variables (IV) approach. However, the robustness section includes a description of estimation results that are based on IV estimates using regional fixed effects (and one individual characteristic) as instruments.

Table A3 reports descriptive statistics for all eight social capital variables per country in the sample. At the micro-level, Spearman's rank correlation coefficients show low correlations among the eight social capital measures, with only a few exceeding the value of 0.4.[19] This relatively low correlation among the social capital variables suggests that they measure distinct facets, justifying their separate analysis.

V. ESTIMATION RESULTS

Tables 1 and 2 report the effects of individuals' positive and negative income distances for our set of social capital measures, taking the national median income level as reference income. For reasons of comparison we also describe the estimates for the absolute income variables, the inclusion of which in the model ensures that relative and absolute income effects are identified separately. In an ordered probit model, the non-linearity of both positive and negative income distances, as well as that of absolute income, leaves simple marginal effects on squared terms without any economic meaning, disguising the direction of influence of the underlying variable. Accounting for the polynomial structure of the model with respect to all income variables, Tables 1 and 2 report their 'total' marginal effects calculated at the sample mean; for reasons of comparisons, we express them as elasticities.[20] As each income variable is highly correlated with its squared term, we use Wald-tests to assess the joint significance of both coefficients. Overall, the Pseudo R^2 of about 0.06 indicates the model is a good fit to the data for all measures of social capital (except for the tax morale regressions).

Table A4 of the Appendix displays the estimates and elasticities of the remaining variables in the model, exemplary for the generalized trust question, our most prominent measure of social capital. All included individual-level determinants are significant at the 1 or 5 percent level, and if not individually, then jointly with covariates relating to the same background factor (e.g. denomination). The following discussion of Tables 1 and 2 puts emphasis on positional concerns (negative income distances), for which we derived our hypotheses in section 2 and which we conjecture to be overall detrimental to the formation of social capital in society. For reasons of comparison, we also discuss the effects of having a positional income *advantage*, the impact of which on social capital cannot be determined *a priori* (see discussion below). For judging the relative importance of the income distances we

assess their elasticities with respect to the absolute income effect, which exerts a social capital-increasing influence in almost all analyses.

1. Generalized Trust

Testing hypothesis 1, the relative income effects for our social capital measure 'generalized trust' are presented in column 1 of Table 1. The dependent variable reflects respondents' four possible answers to the question whether they believe that people in general can be trusted. A low value for the categorical regressand reflects the personal view that people cannot be trusted in general, and thus a low level of individual's generalized trust, and a small contribution to the amount of generalized trust in society (see also Table A1).[21] This social capital measure is commonly employed in empirical analyses that investigate the economic effects of generalized trust in the population (see, e.g., Knack and Keefer, 1997).[22]

The regression results for generalized trust are consistent with our hypothesis 1: the coefficient on the negative income distances is negative and significant at the 1 percent level. Thus, positional concerns are highly destructive for individual's generalized trust: as the distance between her own income to that of the reference group grows, so does her trust in people in general decline. The significant coefficient on the squared term indicates that the effect of positional concerns is non-linear. Gauging the relative importance of positional concerns for individuals' generalized trust, the total elasticity (calculated at the sample mean) suggests that an increase in a positional disadvantage by 1 percent lowers the probability of expressing the highest level of social trust (forth category) by 3.45 percent. This effect is comparable in size to the elasticities of e.g. being in the age group of 50 to 60 years old (.045), of having a lower secondary education (-.03), or of attending religious services frequently (.029). For many of the covariates, however, the observed elasticities are smaller by far than those for the relative income effects. These include, for example, all predictors of

employment status, marital status and religious affiliation (see Table A4 of the Appendix). Thus, the effect of positional concerns is of a considerable magnitude.

For generalized trust, we also observe trust-lowering effects of a positive income distance to the reference income level (at the 5 percent level); this effect is also non-linear, as the Wald-test on the joint significance indicates. The total elasticity suggests that an increase in a positional income advantage by one percent triggers a decline in the likelihood of expressing the highest level of social trust by 3.3 percent. Obviously, the quantitative effects for positional concerns and positional advantages are quite comparable in size.

Column 1 also shows that social trust rises in absolute income, non-linearily, with a total elasticity of 0.38. Comparing relative sizes of the effects of absolute and relative income, the impact of absolute income is about ten times larger than that of either relative income measure.

Comparing the magnitude of the income effects for generalized trust, relative income positions of both poorer and richer people exert considerable social capital lowering effects, with similar quantitative effects. Both are, however, dominated by the impact of absolute income. Possibly, as income of an already advantaged person rises, the positive effect of the rise in absolute income may outweigh the negative one by her improvement in her relative income position, leading to an overall positive effect of income growth on her level of social trust. For a disadvantaged person, however, a further decline in her income yields an overall trust-lowering impact that is a compound effect of the worsening of *both* her relative and absolute income positions.

In sum, our first analysis shows a social trust-lowering effect of a negative income distance which is in support of our hypothesis 1. Compared to the impact exerted by other socio-demographic covariates, the effect is of considerable size and an important economic factor of individual attitude. We also detect further a social capital destroying impact of a positive income distance – a finding that needs some further discussion. That a positional

advantage may destroy social capital is in line with another strand of deprivation theory which claims that positional advantages could create mixed feelings: fears of societal punishment and retaliation by others' driven by their envy. In consequence, individuals with positional advantages then start to distrust in others (e.g., Elster, 1991; Alesina et al., 2004).[23] In sum, these findings do support our hypothesis 1 that positional concerns lead to lower social capital in terms of individual's level of generalized trust. That is, the more concerned people are with their relative (disadvantageous) income position, the less they regard their environment as trustworthy.

Table 1 about here

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2. Trust in Institutions.

2.1. Rule-setters for the economic sphere

The second set of social capital measures relates to vertical trust – that represents the quality of the relationship between institutions and respondent. Columns 2 through 4 of Table 1 provide the results for the relative income effects for individuals' confidence in those institutions which fix the rules of the game in society and set the environment for economic and social participation. In particular, we test hypothesis 2 by investigating into people's trust in parliament, courts, and the business sector.[24] Again, higher values for these variables indicate higher levels of individual vertical trust.

For all three types of rule-setting institutions do we observe a strong non-linear positional concern-effect which is social capital-destroying (at least at the 5 percent significance level). This finding is consistent with hypothesis 2: Respondents are less likely to report the highest level of confidence in the national parliament, the courts, or the business

sector, the more their own income lies below the reference income. Comparing total elasticities for negative income distances, the effects are most sizable for confidence in parliament and courts as compared to the one for confidence in the business sector (-.045 and -.05 versus -.009). With an absolute total elasticity less than 0.01 this latter form of vertical trust appears almost irresponsive to positional concerns. The large negative income distance effects for confidence in the parliament and courts is consistent with our conjecture that positional concern effects are larger for rule-setting institutions: obviously, people hold only legislating institutions which determine the fairness of the income generation process and their economic opportunities responsible for their misery. As alternative explanation for the small relative income effect for trust in the economic sector, as most countries in the sample are institutionally and economically quite well developed, persons not too far below the sample mean (the middle class) may form expectations of upward social mobility taking place in the economic sector which they expect to realize soon. That expectations of an upward social mobility mitigate negative effects of income inequality has been suggested by Alesina et al. (2004) and Bjørnskov et al. (2010).

As for generalized trust, we also observe social capital-destroying effect of positional income advantages. The Wald-tests of joint significance indicate that for all three institutions people's confidence in them is lowered as their advantageous relative income position increases. For trust in the two rule-setting institutions courts and parliament, the relative income advantage exerts effects that are smaller (in absolute size) than those of a disadvantage (parliament: -.026 versus -.045; courts: -.018 versus -.054). Again, as for generalized trust we suspect that persons with a positional advantage fear retaliation and envy by others which overcompensates an (otherwise) positive effect of having an advantage. The opposite is observable for trust in the business sector: here the advantageous relative income effect outweighs that of the positional concerns (-.028 versus -.009). We have argued before that the small impact of positional concerns for those at the sample mean may be due to

expected upward social mobility; thus, for those with a relative income advantage, we suspect that they view themselves as having to defend their current social status.

As already observed for horizontal trust, again, individuals' confidence in all three institutions rises strongly with absolute income. Gauging the relative importance of the socio-economic position measures, the total elasticities suggest that the trust-increasing effect of absolute income is about 5 times larger than that of positional effects.

Overall, consistent with hypothesis 2 we find in Table 1 that positional concerns are deleterious for trust in secular institutions: those not able to keep up with the Joneses appear to attribute the responsibility for their socio-economic position to the parliament and the courts that set the institutional framework of economic and social activity. While some positional concern effects are also observable for confidence in the business sector and the economy, we speculate that their smaller importance by far may be caused by expectations of upward social mobility in that sector.

2.2. Religious organizations

Our hypothesis 4 states that positional concerns should not play a role for confidence in religious organizations and churches as all major religions teach the avoidance of envy. Column 1 of Table 2 tests whether absolute and relative income position effects matter for individuals' confidence in this institution.

The results for confidence in 'churches' and other religious organizations are in line with our expectations: such form of vertical trust appears unaffected by people's positional concerns or advantages. This is indicated by the insignificances of the single coefficient estimates and the Wald tests on the income distance variables. Notably, in contrast to our previous dimensions of social capital, we do not detect any effect of absolute income either.

In sum, we conclude that there is neither a relative nor an absolute income effect for the confidence in church and religious organizations. This finding is in line with hypothesis 4,

and possibly reflecting the (presumably) non-profit and morality-enforcing nature of these institutions.

Table 2 about here

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3. Compliance with Social Norms

3.1. Civic duty as honest tax payer

Table 2 relates to the third dimension of social capital, i.e. compliance with legal and social norms. We measure the adherence to being a 'good' tax payer with two indicators: so-called 'tax morale' and 'government benefit morale'. The 'tax morale' measure relates to the respondent's view on whether it is morally wrong to report income taxes incorrectly, which is an attitude measure of one's own (*de facto*) voluntary tax payment.[25] The lowest category reflects then a low level of social capital; the highest category indicates the answer "seriously wrong". This section also discusses the related concept of 'benefit morale', namely whether it is morally wrong to give incorrect information in order to obtain government benefits[26]. The hypothesis that positional disadvantages affect norm compliance negatively (hypothesis 3) is then tested for 'being an honest tax payer and benefit claimer' in columns 6 and 7 of Table 2.

The most important result is that negative income distances do not show any statically significant association with the social capital-facet 'being a good tax payer': both tax morale and government benefit morale are not affected by positional concerns. A further deterioration of individual's relative income position has no effect on her probability to report the highest category of norm compliance. Obviously, the frustration generated by the discrepancy between one's own income and the aspired-to level is not sufficiently large to induce a break

in social norms. Possibly, as already argued for trust in the economy, a government guaranteeing some upward mobility and future improvements in one's financial situation may mitigate current disappointment and frustration effects of the disadvantaged - as the recent world-wide country comparison by Bjørnskov et al. (2010) suggests.

Similarly, income advantages do not affect people's willingness to pay taxes, as the Wald-tests indicate; – the opposite is observable for benefit morale: here the estimation results for positive income distances suggests that persons with relative income advantages are more likely to reveal an attitude of cheating the government. As observed before for horizontal and vertical trust, social capital also declines in positional advantages. We have to admit that we lack a convincing explanation for the asymmetry between tax morale and benefit morale – possibly, people judge tax evasion as more immoral than cheating the government for subsidies and benefits, as the financial sources of government transfers are often disguised.[27]

For absolute income, we observe a strong positive effect (at least jointly significant at the 5 percent level), suggesting that both tax morale and benefit morale increase as individuals become better off. This finding is in line with previous empirical analyses of tax morale that, however, do not separate relative from absolute income effects (see Torgler, 2007). The total elasticity suggests that the probability of reporting in the highest benefit-morale category increases by 7.1 percent when absolute income increases by 1 percent; as observed for generalized trust and confidence in institutions, the absolute income effect is multiple times larger than the impact of relative income.

Overall, we can conclude that hypothesis 3 is not supported for tax morale and benefit morale: positional concerns appear to play no role for people's willingness to be a 'good citizen and honest taxpayer': the economically relatively deprived do not appear to view 'illegal' redistributive activities through cheating the government as justified. This finding is interpreted in analogy to the negligible positional effect on trust in the business and the

economy, which we explain with expectations of upward mobility that mitigates frustrations of being positional disadvantaged.

3.2. Civic duty of being a truthful witness

Another facet of the third dimension of social capital 'norm compliance' relates to the civic duty of 'being a truthful witness', a form of cooperation with the government when it comes to legal norm enforcement. In column 8 of Table 2, we employ the question whether one attributes a friend the 'right' to one's own unlawful testimony in order to protect her against state prosecution. This social capital measure is constructed in analogy to the tax-payer-morale questions: it asks whether close friends have the right to you giving wrongful testimony aimed at preventing or lowering their punishment – answering in the lowest category reflects a low level of social capital contribution.[28]

Interestingly, in contrast to 'being a good taxpayer', obeisance to the criminal law by truthfully witnessing is quite strongly affected by positional concerns, as hypothesis 3 predicts: as the distance of one's own income from the (higher) reference income grows does one's willingness to comply with the law decline (as the Wald-test on both negative income distance variables suggests). The total elasticity of -.007 suggests, however, a rather small quantitative effect, compared to those observed for other measures of social capital

Analogous to the observations on tax morale compliance, positional advantages do not affect norm compliance. Contrasting expectations, the estimates for the absolute income variables suggest that the willingness to protect a friend's illegal activities against state prosecution increases with absolute income.

Overall, the estimation results for legal norm compliance are consistent with hypothesis 3: they suggest that social deprivation, the clash between aspired-to income and actual income, lowers people's sense for civic duty and causes them to cover up a friend's norm infringements to prevent her prosecution – the deprived cease cooperation with the

government which they may accuse of being responsible for their personal situation. Thus, our findings of the deleterious effects of positional concerns for 'being a good witness' in support of hypothesis 3.

4. Summary and Robustness of Results

4.1. Summary

Table 3 provides a concise overview of the findings of our individual-level analysis of the effect of relative income on social capital formation, reducing the information on the direction of influence and its statistical significance – empty cells indicate that no significant impacts were observable. In sum, we find convincing evidence for the presence of positional concern effects for two of the three dimensions of social capital, namely for generalized trust and confidence in secular societal institutions: having a relative income disadvantage lowers peoples' level of social capital and, implicitly, their contribution to aggregate social capital. This finding persists even when we control for their absolute income. This finding is in line with previous analyses of relative income effects for e.g. happiness that rely on household panels that also account for unobserved heterogeneity (e.g. Ferrer-i-Carbonell, 2005). While social capital-lowering positional concern-effects are also detected for the civic duty 'being a good witness', for the remaining norm compliance measures of 'being a good tax payer' no such influence is present. We explained small positional concern effects for tax and benefit morale, but also for trust in the economy, with people's expectations of an upward social mobility in the economic sphere (e.g. Bjørnskov et al., 2010). Trust in churches and religious institutions is equally not affected by positional concerns, as we had already expected for this higher morale-enforcing institution.

Common to almost all analyses is that individual's level of social capital increases in her absolute individual income. This holds true for all three dimensions of social capital (generalized trust, vertical trust, and norm compliance). The sole two exceptions are, on the

one hand, 'confidence in churches', which is formed irrespective of people's income situation, and, on the other, 'giving a truthful testimony', as the willingness of doing so declines in personal income.

We also observe destructive effects of a positive income distance to the reference income. We explain this finding by the fear of the relatively advantaged from envy, retaliation and criminal activities by the economically relatively deprived; Alesina et al. (2004) use a similar explanation for the heterogeneous effects of income inequality on residents' happiness between the US and European countries. The strongest effects for such social capital lowering impact of a relative income advantage is observable for two of the three dimensions of social capital, namely for generalized trust, confidence in parliament and confidence in business and the economy; they are weak but present for benefit morale.

Judged by their overall elasticities, deleterious effects of positional concerns almost always outweigh the effects of a relative positional advantage (see also Table A5 for three different absolute income percentiles). When significant, the elasticity of the positional concern effects is roughly at -.04. Compared to the size of the elasticities of many other socio-demographic covariates, the impact exerted by income distance is considerable (see Table A4). Even though positional concerns are relevant factors for individuals' contributions to social capital in the country they live in, they are always outweighed by the impact of absolute income, with an elasticity of about 5 times as large as that of positional concerns.

Table 3 about here

4.2. Robustness of Results

Discussing the robustness of our results, one may argue that the inclusion of absolute income confounds the associations between relative income and social capital. However, as described

in the data and methodology section, total and partial correlations among the income variables are so low that this is not likely to be the case. In addition, we present in the bottom row of Table 3 the observable (significant) direction of influence of absolute income when estimating a model that omits the relative income variables. For seven of the eight models, the previously observed relations between absolute income and the social capital variables prevail, suggesting that social capital rises in absolute income (except for confidence in churches which decreases in absolute income).

In addition, one may argue that social capital variables are not comparable across culturally diverse countries. However, the ISSP is explicitly designed to yield internationally comparable results. Arguably, individuals' differences in reporting behavior may still confound the empirical findings. However, as explained in the methodology section, the inclusion of country fixed effects mitigates such bias.

One may also argue that social comparison effects are not identical across all 26 countries in our analysis; thus, our findings for absolute income and negative income distances may be sensitive to the composition of the country sample. We have addressed this concern using two approaches: first, as the small number of individuals per country, often below 1000, does not allow analyzing these effects per country separately, we have run the identical analysis with one specific country excluded at one point in time, yielding no decisive changes. Second, we have added to the empirical model interaction terms of the three income variables with country fixed effect in our empirical model; a (joint) significance of these interactions (according to Wald-tests for each income variable and its squared term separately, e.g., test ($y_{is} * F_s$, $y^2_{is} * F_s$) = 0) would then suggest that the impact of the income measures is heterogeneous across countries and thus, culture- or macroeconomy-specific. However, not only are the single estimates on the interaction terms all insignificant through out, but also do the three Wald-tests on the joint significance not reject the null hypothesis.[29] Overall, our empirical findings in this study appear to be of a general nature.

Similarly, issues of reversed causality have already been discussed in the methodology section. Based on the above-mentioned previous empirical studies on happiness and generalized trust, we have, however, strong reasons to believe that causality rather runs from income to social capital than the other way round. In addition, we have empirically tested this assumption by employing an IV estimator using region fixed effects and a dichotomous individual-level variable ('having supervisory power') as exogenous instruments for income. Table 4 reports the estimated coefficients of the (instrumented) relative income variables and summarizes the direction of influence – due to a weak instruments problem and a much smaller regression sample not all economically relevant factors show up as statistically significant. Arguably, application of standard IV to a categorical dependent variable with only a few categories may also bias the estimates. Thus, the following findings have to be taken with a grain of salt, and are possibly less reliable compared to those presented in Tables 1 to 3. In comparison with Table 3 the important observation in Table 4 is the fact that in most models the positional concern effects prevail, as the negative coefficients on the negative income distance measure indicate, even though absolute income is also controlled for.

Table 4 about here

VI. CONCLUSION

The importance of relative preferences is not a new concept in economics. However, empirical evidence on the extent to which relative income position matters in different aspects of life is relatively rare. Moreover, most empirical studies to date have focused mainly on the impact of relative income position on happiness (Dorn et al., 2007, 2008). Until now, there

have only been limited laboratory experiments dedicated to investigating the consequences of positional concerns for individuals' social behavior (see, e.g., Kirchsteiger, 1994), and some field studies indicating the influence of relative income position on, for example, employer performance or employment decisions (see, e.g., Neumark and Postlewaite, 1998; Torgler et al., 2006).

In order to fill this research void, this current international cross-sectional study uses the rich ISSP 1998 international dataset covering 26 countries and about 25'000 individuals, contributing to the social capital literature. First, (1) it analyzes the impact of relative income disadvantages on individual's contribution to the creation of social capital in her country, controlling for absolute income. Second, (2) it employs eight different questions to measure social capital along three different dimensions: generalized trust, confidence in institutions, and norm compliance.

The results indicate for two of three dimensions of social capital that positional concerns matter greatly for its formation: a disadvantage in individual relative income position is detrimental to her contribution to almost all forms of generalized and vertical trust (except for trust in religious organizations). However, the sense for the civic duty of norm compliance, measured by 'being an honest tax payer', appears not affected by positional concerns, while the civic duty of serving as 'truthful witness' is, again, negatively affected by it. We explain the irrelevance of any type of income for confidence in religious organizations by the specific nature of most religions to create a space freed from social comparisons.

We also find that having a relative income advantage is equally detrimental to the generation of social capital – at least for four out of eight measures. This at first counter-intuitive finding prevails when income distances are instrumented to account for possible reversed causality, and when absolute income is controlled for. We argue that a positive income distance may lead to feelings of fear of crime and retaliation behavior by those relatively worse-off, causing mistrust in one's peers. Judged solely by their total elasticity, for

seven out of eight measures, quantitatively the positional concern effects dominate over the relative income advantage effects.

Although our hypotheses were built on variants of deprivation theory, and were supported by our empirical analysis, in principle it would have been possible to make predictions in the opposite direction. Positional concerns might also lead to incentives to achieve a similar status, thereby inducing motivation and ambition ('white envy'). Similarly, relative income disadvantages triggered by others advancing faster than oneself may yield positive feelings evoked by expectations of being on a rising income trajectory, the so-called 'tunnel effect' or 'information effect' (Hirschman, 1973). A dominating information effect for relatively disadvantaged persons was identified by Senik (2008) for post-communist transition countries until 1997 and similarly by Alesina et al. (2004) for the U.S., while in Western Europe, the comparison effect appears to dominates the information effect (see also Senik, 2004). Similarly, Bjørnskov et al. (2010) find that negative effects of income inequality for happiness are lowered in socially mobile countries, that are also perceived as such by the population. Given that most countries in the sample are institutionally well developed or even OECD countries, we speculate that the missing effects of positional concerns for 'being a good tax payer' and the negligible effects for trust in the economy are caused by upward economic mobility expectations.

In general, for social trust the demonstrated capacity for positional concerns and positional advantages to destroy social capital nicely supports the existing empirical evidence in cross-country studies for the trust-lowering impact of income inequality, taking account of overall wealth effects (see Jordahl, 2007, for an overview). In this study, we can show that the effect at the aggregate level is not only driven by the destructive effects exerted by those individuals who are economically deprived, but also by those with a relative income advantage.

This paper presents analogous results of deleterious positional concern effects for confidence in parliaments, courts and the business sector. Happiness studies have revealed the relevance of the 'rule of law' in both developing and developed countries, which dominates the potentially beneficial effects of democratic decision-making (Bjørnskov, Dreher and Fischer, 2010). Given that the quality of the legal and court system and the confidence invested therein are in a perpetual feedback relation (with each functioning as the other's transmission channel), our finding bears important policy implications, particularly for developing countries and emerging economies.

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[1] In the ancient world, Aristotle (1924) treated envy in his *Rhetoric*. During the age of enlightenment, Immanuel Kant, in his 1785 *Metaphysics of Morals*, and Francis Bacon, in his 1625 *Of Envy*, discussed in detail the psychology of ingratitude and 'Schadenfreude', provided well-developed definitions of envy and emphasized the importance of social comparisons. Other, modern classical philosophers such as Schopenhauer, Kierkegaard, or Nietzsche have also stressed the function of envy in human society.

[2] This study includes one additional country, increasing the variation in national reference income. The analysis in Fischer and Torgler (2006a) is partly flawed in the way reference income and relative income are defined, causing a quite high correlation which partly hinders statistical identification.

[3] See Becker (1974), Easterlin (1974), Scitovsky (1976), Schelling (1978), Pollak (1976), Boskin and Sheshinski (1978), Frank (1985), Akerlof and Yellen (1990).

[4] For example, Stouffer (1949) has shown that the relatively rapid average promotion rate for the group as a whole tends to lead to frustration about individual promotion rates.

[5] It can be argued that the effect might depend on the structure of the tax system, in particular on progression of the income tax schedule. A higher degree of progression may reduce the negative impact of a relative disadvantage, but also the positive effect of a relative advantage. In our model, country/region fixed effects will implicitly control for such an impact.

[6] See Bjørnskov (2007) for a discussion of the various dimensions of social capital and their interrelations.

[7] According to the modified OECD equivalence scale, equivalent household income is obtained by dividing it through a specific correction factor that takes account of economies of scale in household production. This correction factor assigns the first adult in the household a weight of 100%, and every remaining adult a weight of 50%, while any child receives a weight of 30%. The income of a typical 2-parents-2-children household would then be corrected by dividing by 2.1 (= 1 + 0.5 + 2x0.3).

[8] The empirical happiness literature has rather employed the mean income as benchmark income (e.g. Ferrer-i-Carbonell, 2005; Dorn et al., 2007). In our sample, however, the average is often located around the 70th percentile of the income distribution, letting its role as comparison income appear unlikely Regional and national income is highly correlated ($\rho = 0.96$), and estimation with a regional comparison income yields qualitatively identical results. Using a similar specification, results for the regional and national (subsistence/median) income and a graphical representation of main income effects are reported in Fischer and Torgler (2006*a*, 2006*b*).

[9] Purchasing Power Parity (PPP) conversion scales may be subject to measurement errors and lead to imprecise estimates.

[10] The descriptive statistics are reported in Table A2.

[11] The first uses bi-regional average income per year using the GSOEP, while the second employs average wages in the same profession for an observed cross-section of workers.

[12] Taking the log avoids quasi-multicollinearity (correlation too high with the relative income variables). To account for non-linearities, we also include its squared term, while conducting a test on joint significance. As social capital should not be equated with utility, the functional form should be chosen as flexible as possible.

[13] Partial correlation between two out of the 6 income variables controls for the whole set of individual-level variables (in addition to the 4 remaining income variables, as in the full model presented in the Appendix).

[14] Inclusion of fixed effects does not permit correction of within-group correlation through clustering at the aggregate level (Moulton, 1990).

[15] Based on the previous empirical happiness literature, we consider a Pseudo R2 of about 0.06 as good (e.g. Frey and Stutzer, 2000).

[16] In contrast, Dorn et al. (2007) assume asymmetry only with respect to the second derivative of the estimated happiness function, and a symmetric one with respect to its first.

[17] Although the Wald-test tests the null hypothesis that two (or more) coefficient estimates are jointly insignificant (H_0: coeff(var1) = coeff(var2) = 0), we will henceforth term it 'Wald-test of joint significance' as often encountered in the empirical literature.

[18] Causing reversed causality, engagement in social activities might be perceived as high productivity signal by the employer leading to higher wages. For example for an omitted third factor, optimistic persons might view their peers as more trustworthy, on the one hand, and be more financially successful, on the other.

[19] All Spearman's rank correlation coefficients are significant at the 1 percent level.

[20] Even though the coefficient estimate on absolute income is for its logarithmized form, the total elasticity pertains to equivalized absolute income in its original form.

[21] Original question: "Generally speaking, would you say that people can be trusted or that you can't be too careful in dealing with people?" Possible answers were "people can almost be trusted", "people can usually be trusted", "you usually can't be too careful in dealing with people" or "you almost always can't be too careful in dealing with people".

[22] The ISSP also includes a question whether people perceive themselves as being treated fairly by others. Preliminary empirical analyses revealed that this question is most likely not a measure of generalized trust, but approximates a different construct. Possibly, it constitutes rather a form of particularized trust rather than generalized trust.

[23] Examples for a retaliating behavior are criminal activities: An envious person experiences an increase in her utility by destroying others' assets, even if destruction comes at some costs (see Mui, 1995).

[24] Original question: "How much confidence do you have in ….(1) parliament (2) business and industry (3) churches and religious organizations (4) courts and the legal system". Possible answers were "complete confidence", "a great deal of confidence", "some confidence", "very little confidence" or "no confidence at all".

[25] Original question: "Consider the situations listed below. Do you feel it is wrong or not wrong if…a taxpayer does not report all of [his/her] income in order to pay less income tax". Possible answers were "not wrong", "a bit wrong", "wrong" and "seriously wrong".

[26] Original question: "Do you feel it is wrong or not wrong if a person gives the government incorrect information about [himself/herself] to get government benefits that [he/she] is not entitled to". The range of possible answers is the same as in the preceding footnote.

[27] For example, if funds for government subsidies are from the European Union or another international source , the benefit cheater does not feel as if she was cheating on her own peers.

[28] The questionnaire describes the following situation: "Suppose you were riding in a car driven by a close friend. You know he is going too fast. He hits a pedestrian. He asks you to tell the police that he was obeying the speed limit. Which statement comes closest to your belief about what your friend has a right to expect from you?". Possible answers were "My friend has a DEFINITE right as a friend to expect me to testify that he was obeying the speed limit", "My friend has SOME right as a friend to expect me to testify that he was obeying the speed limit" or "My friend has NO right as a friend to expect me to testify that he was obeying the speed limit".

[29] The tests of joint significance on all three income variable and their squared terms, however, do reject the null, suggesting that (non-interacted) relative and absolute income does matter to people's social capital contribution.

Tables

Table 1:

Generalized trust and Confidence in Institutions I

	(1) Generalized trust	(2) Parliament	(3) Courts	(4) Business
Abs. income (log)	0.192**	0.054	0.081*	0.195**
	[4.22]	[1.43]	[2.08]	[4.86]
Abs. income (log), squared	0.005**	-0.003	0.002	-0.003
	[2.84]	[1.80]	[1.25]	[1.93]
Neg. income distance	-0.307**	-0.267*	-0.307**	-0.247*
	[2.67]	[2.38]	[2.77]	[2.20]
Neg. income distance, squared	0.618**	0.452**	0.448**	0.670**
	[3.81]	[2.93]	[2.95]	[4.36]
Pos. income distance	-0.035*	-0.026*	-0.021	-0.027
	[2.04]	[2.06]	[1.57]	[1.95]
Pos. income distance, squared	0.00008	0.0002*	0.0002	0.0001
	[0.60]	[2.36]	[1.80]	[1.21]
Total elasticity abs. income (at mean)	.3757	.1790	.1529	.5447
Total elasticity neg. income distance (at mean)	-.0345	-.0449	-.0543	-.0089
Total elasticity pos. income distance (at mean)	-.0330	-.0258	-.0184	-.0285
Observations	25623	25018	25144	24579
Pseudo R2	0.0751	0.0583	0.0596	0.0668
Tests				
Wald test abs income	21.61**	6.25*	5.12	30.95**
p-value	0.0000	0.0439	0.0773	0.0000
Wald test neg. income distance	14.71**	8.90*	9.95**	19.63**
p-value	0.0006	0.0117	0.0069	0.0001
Wald test pos. income distance	21.10**	6.61*	3.71	39.34**
p-value	0.0000	0.0368	0.1567	0.0000

Notes: Ordered probit estimation with country fixed effects. (Total) elasticities are calculated at the sample mean for the highest category of the social capital variable, elasticities are for the non-logarithmized form of absolute income. '*', '**' denote significances at the 1-, and 5-percent levels, respectively. 'Neg. income distance' is defined as $(y_s - y_{is})/ y_s$, if $y_{is} < y_s$ and 0 otherwise, and 'pos. income distance' as $(y_{is} - y_s)/ y_s$ if $y_{is} \geq y_s$, and 0 otherwise, with y_s denoting the national median income.

Table 2:

Confidence in Institutions II and Compliance with Social Norms

	(5) Church	(6) Tax morale	(7) Benefit morale	(8) No wrongful testimony
Abs. income (log)	-0.021	0.035	0.144**	-0.035
	[0.55]	[0.89]	[3.57]	[0.59]
Abs. income (log), squared	-0.0001	0.005**	0.008**	0.006*
	[0.06]	[2.85]	[4.42]	[2.35]
Neg. income distance	0.029	-0.114	-0.156	0.135
	[0.26]	[1.01]	[1.33]	[0.84]
Neg. income distance, squared	-0.004	0.088	0.197	-0.451*
	[0.03]	[0.57]	[1.22]	[2.13]
Pos. income distance	-0.008	-0.021	-0.015	0.014
	[0.61]	[1.53]	[1.09]	[0.75]
Pos. income distance, squared	0.0001	0.0001	0.00006	0.0001
	[0.94]	[1.53]	[0.69]	[0.82]
Total elasticity abs. income (at mean)	-.0396	.0026	.0713	-.0249
Total elasticity neg. income distance (at mean)	.0124	-.0175	-.0119	-.0073
Total elasticity pos. income distance (at mean)	-.0059	-.0099	-.0047	.0002
Observations	24919	25268	25532	22544
Pseudo R2	0.1129	0.0399	0.0547	0.0743
Tests				
Wald test abs income	0.31	8.23*	27.33**	8.01*
p-value	0.8569	0.0163	0.0000	0.0182
Wald test neg. income distance	0.10	1.04	1.98	5.12
p-value	0.9492	0.5942	0.3717	0.0773
Wald test pos. income distance	4.75	2.35	8.08*	0.89
p-value	0.0931	0.3092	0.0176	0.6421

Notes: See Table 1.

Table 3:

Overview of Regression Results

	Social Trust	Confidence in Institutions				Compliance with social norms		
	Gen. trust	Parliament	Courts	Business	Church	Tax morale	Benefit morale	No wrongful testimony
				Relative Income Position				
Neg. income distance	-	-	-	-				(+)
Neg. income distance squared	+	+	+	+				-
Pos. income distance	-	-		(-)			(-)	
Pos. income distance, squared	(+)	+		(+)			(+)	
				Absolute Income				
	+	(+)	+	+		(+)	+	(-)
				Model with Absolute Income Only				
Abs. income	+	(+)	+	+	-	+	+	
Abs. Income, squared	+	(-)	(+)	(-)		+	+	+

Notes: -, + indicate social capital diminishing / increasing influences, independently significant at least at the 5 or 1 percent level. (–), (+) denote influences that are only jointly significant according to the Wald-tests.

Table 4

Instrumental Variables Regressions

	(1) Gen. trust	(2) Parliament	(3) Courts	(4) Business	(5) Church	(6) Tax morale	(7) Benefit morale	(8) No wrongful testimony
Neg. income distance	-2.158*	-1.059	0.786	0.261	-0.606	-0.054	0.098	-1.565*
	[2.36]	[0.90]	[0.62]	[0.24]	[0.48]	[0.04]	[0.10]	[1.96]
Neg. income distance, squared	4.328**	1.653	-1.569	0.851	-0.123	-3.262*	-1.232	1.579
	[3.79]	[1.18]	[1.03]	[0.65]	[0.08]	[2.19]	[0.98]	[1.71]
Pos. income distance	-0.319	-0.039	-0.248	-0.477	-0.032	0.271	-0.160	-0.030
	[1.61]	[0.16]	[0.93]	[1.94]	[0.11]	[1.14]	[0.72]	[0.17]
Pos. income distance, squared	0.006	-0.002	0.003	0.011	0.005	-0.006	0.002	0.004
	[1.17]	[0.27]	[0.52]	[1.59]	[0.68]	[0.93]	[0.29]	[0.86]
Simple model								
Neg. income distance	-0.248	0.165	-0.624	-0.524	-1.330	-1.307*	-0.853	-1.189**
	[0.49]	[0.25]	[0.89]	[0.87]	[1.91]	[2.02]	[1.56]	[2.60]
Pos. income distance	-0.109	-0.108	-0.114	-0.085	0.162*	0.068	-0.096	0.133*
	[1.93]	[1.52]	[1.42]	[1.34]	[2.08]	[1.00]	[1.48]	[2.35]
Observations	15193	14981	15047	14826	14772	15076	15198	14172
R2	0.140	0.150	0.140	0.110	0.250	0.070	0.060	0.040

Notes: IV estimations with country fixed effects. Instruments are region fixed effects and a dichotomous measure of having supervisory power. **, * denote significances at the 1-, and 5-percent levels, respectively. 'Neg. income distance' is defined as $(y_s - y_{is})/ y_s$, if $y_{is} < y_s$ and 0 otherwise, and 'pos. income distance' as $(y_{is} - y_s)/ y_s$ if $y_{is} \geq y_s$, and 0 otherwise, with y_s denoting the national median income.

Appendix

Table A1

Description of Control Variables and Summary Statistics

Variable	Mean	Std. Dev.	Min	Max	Based on the VWS variables
Main independent variables					
Individual equivalent income (y_{is})	0.47	0.96	0.00	11.00	OECD equivalized V216
National median income (y_s)	0.42	0.68	0.00	2.13	See above
Abs. income (log)	-3.12	2.97	-13.91	2.40	See above
Abs. income (log) squared	18.58	29.79	0	193.47	See above
neg. income distance	0.17	0.23	0	0.99	See above
neg. income distance squared	0.08	0.15	0	0.97	See above
pos. income distance	0.44	1.57	0	139.26	See above
pos. income distance squared	2.67	127.28	0	19393.27	See above
Control variables					
Female	0.53	0.50	0	1	V200
Age 30–39	0.22	0.41	0	1	V201
Age 40–49	0.20	0.40	0	1	V201
Age 50–59	0.16	0.37	0	1	V201
Age 60–69	0.14	0.34	0	1	V201
Age 70–79	0.08	0.27	0	1	V201
Age > 80 years	0.02	0.12	0	1	V201
Level of education	4.60	1.45	1	7	V205
Level of education squared	23.23	13.46	1	49	V205
Single	0.19	0.39	0	1	V202
Separated or divorced	0.08	0.27	0	1	V202
Widowed	0.09	0.28	0	1	V202
attendance of religious services	2.36	2.05	1	9	V59
Catholic	0.41	0.49	0	1	V217
Jewish	0.03	0.17	0	1	V217
Protestant	0.21	0.41	0	1	V217
Orthodox	0.06	0.24	0	1	V217
No denomination	0.23	0.42	0	1	V217
Buddhist	0.01	0.12	0	1	V217
Muslim	0.01	0.10	0	1	V217
Urban	0.49	0.50	0	1	Community type variables
Rural area	0.28	0.45	0	1	See above
Self-employed	0.09	0.29	0	1	V206
Unemployed	0.05	0.22	0	1	V206
Retired	0.19	0.39	0	1	V206
Housewife	0.10	0.30	0	1	V206
Disabled	0.02	0.14	0	1	V206
Out of labour force	0.01	0.10	0	1	V206

Notes: This table is based on 25623 observations in the generalized trust regression (Table 1 column 2). Absolute income variables measured in 1000 PPP-adjusted international $.

Table A2

Description of Dependent Variables and Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	Based on the VWS variables
Generalized trust	25623	2.28	0.80	1	4	V19
Confidence in parliament	25018	2.54	1.02	1	5	V20
Confidence in courts	25144	2.86	1.09	1	5	V21
Confidence in business	24579	2.72	0.95	1	5	V22
Confidence in church	24919	2.92	1.20	1	5	V23
Tax morale	25268	2.97	0.94	1	4	V16
Benefit morale	25532	3.40	0.79	1	4	V17
No wrongful testimony	22544	2.67	0.59	1	3	V63

Table A3

Country Means for 8 dimensions of social capital

Country	Code	Gen. Trust (count)	Percent of total sample	Gen. Trust	Tax morale	Gov. benefits	No wrongful testimony	Confidence in parliament	Confidence in business	Confidence in courts	Confidence in church
1	Germany	1890	5.80	2.31	2.67	3.23	2.66	2.38	2.77	2.87	2.50
2	USA	1149	3.52	2.46	3.12	3.48	-	2.73	2.81	3.04	3.31
3	AUT	954	2.93	2.47	2.48	3.37	2.73	2.70	3.30	2.96	2.74
4	HUN	959	2.94	2.21	2.98	3.49	2.87	2.75	2.98	2.72	3.09
5	ITA	941	2.89	1.96	2.99	3.41	2.70	2.21	2.35	2.65	3.02
6	NL	1826	5.60	2.65	2.84	3.65	2.85	3.02	2.99	3.08	2.73
7	NOR	1414	4.34	2.84	3.03	3.61	2.70	3.09	3.42	2.94	2.90
8	SWE	992	3.04	2.69	3.19	3.67	2.81	2.64	3.09	2.93	2.62
9	CZ	1093	3.35	2.44	3.06	3.35	2.76	1.99	2.19	2.30	2.37
10	SLO	963	2.95	1.86	3.11	3.37	2.54	2.17	2.91	2.75	2.55
11	PL	1032	3.17	2.07	3.01	3.17	2.57	2.28	2.76	2.55	3.29
12	BUL	1014	3.11	1.97	3.21	3.42	2.58	1.99	2.03	2.09	2.59
13	RUS	1409	4.32	1.97	2.32	2.90	2.39	2.10	2.26	2.01	3.04
14	NZL	890	2.73	2.52	3.04	3.57	2.89	2.13	2.93	2.94	2.83
15	CAN	664	2.04	2.50	3.08	3.64	2.82	2.43	2.71	2.88	2.87
16	RPHIL	1096	3.36	2.12	2.95	3.00	2.31	3.38	3.40	3.31	3.92
17	ISRL	1138	3.49	2.04	2.91	3.27	2.66	2.48	3.59	3.07	2.60
18	JP	1068	3.28	2.22	3.39	3.61	2.54	2.02	3.12	2.46	2.09
19	ESP	2215	6.79	2.26	3.34	3.57	2.70	2.74	2.55	2.91	2.92
20	LTV	1073	3.29	1.99	2.61	2.93	2.38	2.09	2.49	2.43	3.07
21	SK	1167	3.58	1.88	3.01	3.25	2.52	2.76	2.98	2.25	3.10
22	FRA	1035	3.17	2.27	2.73	3.45	2.73	2.37	2.70	2.10	2.36
23	PORT	1132	3.47	2.13	3.05	3.37	2.83	2.59	2.89	2.43	3.36
24	RCH	1398	4.29	1.87	3.00	3.09	2.59	2.38	2.24	2.78	3.57
25	DEN	1022	3.13	2.69	3.15	3.74	2.81	2.69	3.52	3.22	3.00
26	CH	1111	3.41	2.63	2.75	3.57	2.83	2.92	3.11	2.70	2.92

Notes: Country averages of the social capital variables based on the 'generalized trust' sample (Table 1 column 1).

Table A4: *Determinants of generalized trust*

	Coeff.	z-value	elasticity
Abs. income (log)	0.192**	[4.22]	0.375
Abs. income (log) squared	0.005**	[2.84]	
neg. income distance	-0.307**	[2.67]	-0.034
neg. income distance squared	0.618**	[3.81]	
pos. income distance	-0.035*	[2.04]	-0.033
pos. income distance squared	0.00008	[0.60]	
Female	0.011	[0.74]	0.204
Age 30-39	0.032	[1.32]	0.013
Age 40-49	0.102	[3.98]	0.016
Age 50-59	0.059	[2.11]	0.045
Age 60-69	0.056	[1.61]	0.021
Age 70-79	0.036	[0.87]	0.017
Age > 80 years	0.219	[3.02]	0.007
Education level 2	-0.092	[1.30]	-0.011
Education level 3	-0.073	[1.12]	-0.031
Education level 4	0.042	[0.63]	0.018
Education level 5	0.148	[2.21]	0.109
Education level 6	0.262	[3.72]	0.054
Education level 7	0.372	[5.36]	0.109
Single	0.045	[2.07]	0.019
Separated or divorced	-0.104	[3.75]	-0.018
Widowed	-0.024	[0.81]	-0.004
Church attendance 2	0.101	[4.11]	0.022
Church attendance 3	0.122	[5.11]	0.031
Church attendance 4	0.138	[5.23]	0.029
Church attendance 5	0.271	[5.94]	0.020
Church attendance 6	0.304	[5.97]	0.017
Church attendance 7	0.147	[2.87]	0.007
Church attendance 8	0.223	[4.80]	0.016
Church attendance 9	0.153	[2.72]	0.006
Catholic	-0.013	[0.31]	-0.012
Jewish	0.002	[0.02]	0.0001
Protestant	0.034	[0.82]	0.016
Orthodox	0.089	[1.35]	0.012
No denomination	0.033	[0.79]	0.017
Buddhist	-0.036	[0.48]	-0.001
Muslim	0.229	[2.41]	0.005
Urban area	-0.008	[0.39]	-0.008
Rural area	0.046	[2.18]	0.029
Self-employed	0.023	[0.83]	0.005
Unemployed	-0.085	[2.36]	-0.010
Retired	-0.016	[0.54]	-0.006
Housewife	-0.028	[0.99]	-0.006
Disabled	-0.156	[2.73]	-0.007
Out of labour force	-0.033	[0.44]	-0.008
Observations	25623		
Pseudo R2	0.0751		
Wald-test (all religious denominations)	12.12		
p-value	0.096		

Notes: Ordered probit estimation with country fixed effects, respectively. '**', '*' denote significances at the 1 and 5 percent levels, respectively

Table A5:

Overview of Regression Results: Total marginal effects

	Social Trust	Confidence in Institutions				Compliance with social norms		
	Gen. trust	Parliament	Courts	Business	Church	Tax morale	Benefit morale	No wrongful testimony
Absolute Income	*Relative Income Position: Negative*							
25th percentile	-0.0157	-0.0116	-0.0234	-0.0062	0.0035	-0.0404	-0.0618	0.0412
Rel. income = 0	-0.0220	-0.0141	-0.0273	-0.0108	0.0034	-0.0407	-0.0619	0.0444
75th percentile	-	-	-	-	-	-	-	-
	Relative Income Position: Positive							
25th percentile	-	-	-	-	-	-	-	-
Rel. income = 0	-0.0026	-0.0014	-0.0019	-0.0012	-0.0009	-0.0076	-0.0058	0.0047
75th percentile	-0.0036	-0.0016	-0.0021	-0.0020	-0.0009	-0.0074	-0.0057	0.0048
	Absolute Income (in log-form)							
25th percentile	0.0177	-0.0019	0.0112	0.0024	-0.0030	0.0686	0.1603	0.0451
Rel. income = 0	0.0744	0.0002	0.0102	0.0061	-0.0026	0.0429	0.1128	0.0203
75th percentile	0.0223	0.0024	0.0092	0.0131	-0.0023	0.0212	0.0714	-0,0031

Notes: Total marginal effects are calculated for the 25th and, the 75th percentiles of the log-income distribution and the log income for which both relative income positions are zero (for the average equalized income), and their specific corresponding relative income positions. All remaining covariates are evaluated at the social capital-specific regression sample means.

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