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EVIDENCE FROM 26 COUNTRIES

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Abstract: Research evidence on the impact of relative income position on individuals' attitudes and behaviour is sorely lacking. Therefore, using the International Social Survey Programme 1998 data from 26 countries this paper investigates the impact of relative income on 14 measurements of social capital. We find support for a considerable deleterious positional concern effect of persons below the reference income. This effect is more sizeable by far than the beneficial impact of a relative income advantage. Most of the results indicate that such an effect is non-linear. Lastly, changing the reference group (regional versus national) produces no significant differences in the results.

Concerns about relative position is, according to Frank (1999, p. 145), a "deep-rooted and ineradicable element in human nature". Its social repercussions have long preoccupied human secular self-reflection and contemplation.[1] In economics theory, Adam Smith (1759/1976), like his successors Karl Marx (1849) and Thorstein Veblen (1899), emphasized the importance of relative position and social concerns. Since then, these ideas have been stressed by modern economists such as Arthur Pigou (1920), John Maynard Keynes (1930), James Duesenberry (1949) and Harvey Leibenstein (1950). In contrast to the traditional standard utility theory position that individuals evaluate their welfare only in absolute terms, the theory of the creation of position concerns assumes that individual welfare depends on comparisons with others. Whereas Smith (1759/1976) proposed relative wants as central to human behaviour and Marx (1849) emphasized that humans measure their desiderata and pleasure in relation to society, Veblen's (1899) concepts of conspicuous leisure and consumption stress the importance of an individual's relative position in society. Subsequently, by developing a utility concept characterized by systematically interdependent utilities, Duesenberry (1949) incorporated relative preferences into consumer theory. Even Marshall (1961), often seen as the creator of modern demand theory, notes the relevance of human distinction, while Leibenstein (1950) stresses the non-fiction demand for consumption goods due to, for example, a *bandwagon effect* in which others' behaviour affects individual choices.

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 behaviour (see Senik, 2005). Moreover, of the studies on the effect of relative income position that do exist, most focus on its association with happiness rather than its impact on social capital (e.g., Dorn et al., 2007, Ferrer-i-Carbonell, 2005). Besides its narrow focus, the empirical research on the impact of the relative income position has also been hindered by lack of data or inadequate methodology. As Ferrer-i-Carbonell (2005) points out, "most economists have used (and are fond of) cross-section micro-empirical data,

i.e., data at the individual level and for only one country" (p. 998). However, not only do relatively new international survey data sources now allow detailed investigation of social capital for a *variety of countries*, but more sophisticated statistical techniques and designs are also enabling researchers to take advantage of cross-national variations in these data.

To remedy this research void, this paper contributes to the recent discussion in two aspects: first, by employing 14 different measures of social capital it aims to produce detailed evidence on the impact of positional concerns and social capital, reflecting four different dimensions of social capital: generalized trust, confidence in institutions, compliance with social norms, and civic engagement. In addition, our study overcomes methodological shortcomings by using survey data from the 1998 wave (RELIGION II) of the International Social Survey Programme (ISSP), which not only covers approximately 24'000 persons in *26* countries. Moreover, in line with some previous studies, we include an almost complete set of control variables to better isolate partial correlations between relative income position and social capital (see Appendix Table A1).

The remainder of the paper is organized as follows. Section 2 develops the theoretical approach and predictions. Section 3 describes the dataset, and Section 4 presents the empirical results. Section 5 concludes the paper.

II. THE EFFECT OF RELATIVE INCOME POSITION ON SOCIAL CAPITAL

II.I The Role of Relative Income Position in Society

In social science theory, positional concerns have historically been 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 of the importance of social comparisons, social psychology, sociology and anthropology have also traditionally placed much emphasis on the relevance and fundamentality 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, several economists have elaborated on the concept of interdependent preferences, whose inclusion in economic theory allows social comparisons (e.g., Becker, 1974; Easterlin, 1974; Scitovsky, 1976; Schelling, 1978; Pollak, 1976; Boskin and Sheshinski, 1978; Frank, 1985; Akerlof and Yellen, 1990). According to Frank (1991), not only do individual decisions have important consequences for the decision-maker herself, but they also generate what he terms *positional externalities.* To illustrate, he shows how such welfare comparisons between individuals help explain the existence of such diverse elements as 24-hour supermarkets, excessive formalism in economics, cycles of fashion and public spiritedness, muddled bureaucratic language, excessive cosmetic surgery and pressures to consume growth hormones. He concludes that "…the more we learn about them, the more likely it seems that actions *without* external effects may be the real exceptions" (p. 44). McAdams (1992) points out that social scientists have neglected the aspect of positional concerns, but have challenged the concept of selfishness: "primarily by exploring ways in which *preferences* are positively dependent on each other, as when empathy, altruism, or moral commitment cause one person to desire that others be able to satisfy their own desires. Much less has been said about the extent to which preferences are negatively interdependent, and the economic consequences of such preferences" (p. 3).

Positional concerns may translate into envy, when the individual's current situation is below his or her own aspiration level. In philosophy, in which envy has been viewed "as one of the inescapable questions of existence" (Schoeck, 1966, p. 194), Zeckhauser (1991, p. 9) also stresses that "Envy ... is a subtle and powerful feeling, motivating everything from

political movements to murders". It is Kant (1785/1964) who provides a well-developed definition:

> Envy (livor) is a tendency to perceive with displeasure the good of others, although it in no way detracts from one's own, and which, when it leads to action (in order to diminish that good) is called qualified envy, but otherwise only ill-will (invidentia); it is however only an indirect, malevolent frame of mind, namely a disinclination to see our own good overshadowed by the good of others, because we take its measure not from its intrinsic worth, but by comparison with the good of others and then go on to symbolize that evaluation. (Cited in Schoeck 1966, p. 201)

Ainslie (1992) argues that "putting oneself in another's shoes may offer a single, distinct, and thus robust alternative to the perception of life in one's own shoes. This alternative perception of reality is experienced as envy" (p. 323). Not only do social scientists – including social psychologists, anthropologists, sociologists and political scientists – stress the important role of envy in everyday life (e.g., Foster, 1967; Elster, 1991), but 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). Subsequently, using a rational choice framework, Mui (1995) incorporates envy into standard economic theory to explore agents' sabotage or retaliative behaviour against others.

In real life, individuals' relative judgements of their own positions do appear commonplace (see Frank, 1985; Frank and Sunstein, 2001; Solnick and Hemenway, 1998; Zeckhauser, 1991; Tversky and Griffing, 1993; Johansson-Stenman et al., 2002 and Alpizar et al., 2005). That is, people tend to compare themselves with their environment and care greatly about their relative position, which in turn influences their attitudes and observable behaviour. Moreover, as German social scientist Helmut Schoeck (1966) amply demonstrates, positional

concerns are a widespread social phenomenon that engenders myriad everyday actions aimed at reducing it. For example, school uniforms are thought to reduce possible envy among pupils and schoolteachers may ask parents not to incite envy in classmates by 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).

Indeed, systematic tests carried out by psychologists and economists suggest that people do take into account relative income position when making real life decisions such as choosing between two earning schemes. Economic psychologists Frank and Sunstein (2001) hypothesize two possible worlds: in world A, the individual earns $110,000 a year, while colleagues earn $200,000; in alternative world B, the individual earns less than in world A ($100,000 per year), but the others earn only $85,000 (p. 336). In a traditional economic approach, world A should be preferable because it offers higher absolute wage. However, the choices made by test subjects paint a different picture – that is, a substantial number of respondents opted for world B, thereby confirming Frank's (1985) earlier findings using similar tests. Solnick and Hemenway (1998), who test 257 faculty, students and staff members at Harvard School of Public Health using a similar scenario, find that approximately 50 percent of their respondents preferred the world in which they had a higher relative income position. Likewise, Johansson-Stenman et al. (2002) and Alpizar et al. (2005) find evidence that both absolute and relative income, as well as consumption, matter for individual utility or well-being. Finally, Tversky and Griffin (1993), in a study of the relation between envy and happiness, observe that 85 percent of their test subjects chose the world with the higher absolute salary and the lower relative position. However, interestingly, 62 percent anticipated a higher job satisfaction in the world with the higher relative income position. Similar results are also reported for comparisons at the macro level (e.g., Zeckhauser, 1991).

Experimental economists have also discovered the relevance of incorporating positional concerns into such research tasks as explaining outcomes in ultimatum games in which two or more persons must agree on how to share a given amount of money (see, e.g., Kirchsteiger, 1994). Frank and Sunstein (2001) stress that "… preference for good relative position does not explain all of what occurs in the game; ensuring a fair outcome, which may or may not call for good relative position, is often the driving factor. But relative position also counts for many participants, so much so that 'difference aversion' appears to motivate a significant percentage of participants" (p. 344). A decade earlier, Elster (1991) had even gone so far as to criticize the sense of fairness that characterizes experimental evidence from ultimatum games, suggesting that a sense of envy "would sometimes be more appropriate for analogous behaviour in real life" (p. 66). Thus, the welfare of an envious person increases the danger that others' assets will be destroyed, even when such destruction has its own costs.

To operationalise this concept for empirical research it is necessary to define an appropriate proxy for 'positional concerns', 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 to an individual's possibility set (consumption possibilities) and affects well-being. In line with the previously discussed experimental findings, positional concerns are assumed to arise when one's own income is lower than a specific aspiration level that, in turn, is determined by one's own expectations. Although appealing as theoretical construct, the individual aspiration income, however, is barely directly observable in real life. However, following the approach taken by the 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. In other words, we believe that the measure of 'relative income position' allows to investigate the implications of positional concerns on social capital (also providing an indirect insight into the consequences of envy).

Moreover, using the concept of relative income, one can also investigate to which extent an advantageous income position, namely a position beyond the reference income, affects happiness and social capital.

II.II Dependent Variables: Social Capital

Economists have discovered social capital – widely studied and highly prominent in all social sciences – to be an important determinant of economic phenomena like macroeconomic performance. For example, Knack and Keefer (1997), in a cross-sectional analysis, find a strong and significantly positive relationship between social capital variables (civic duty) and economic growth. Schaltegger and Torgler (2007), using data for a synthetic panel of Swiss cantons over the 1981–2001 period, show that trust enhances fiscal performance. As regards public finance, Slemrod (1998) argues that social capital – measured as the willingness to pay taxes voluntarily – lowers the cost of government operations and of equitably assigning such cost to citizens. Such research justifies a closer look at what shapes social capital.

The notion of social capital encompasses multiple aspects. In this paper, we distinguish its multiple facets along four different dimensions: trust between people, confidence of the people in institutions, compliance with social norms, and the creation of networks (Putnam, 2001; Bjørnskov, 2005). 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).

Because generalized trust, the belief that most people can be trusted, does not depend on a specific individual or on group characteristics (see, e.g., Uslaner, 2002), we measure it 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?". Generalized trust is also expressed

by the perception of others' fairness towards oneself (e.g., "How often do you think that people would try to take advantage of you if they got the chance and how often would they try to be fair?").

Whereas generalized trust is shaped by 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 – such as "How much confidence do you have in institution X?" – to test several facets of particularized or institutional trust. The important institutions to be analysed are parliament, the courts and legal system, businesses and industries, and social institutions like the church and religious organisations.

The second 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 little compliance and far too much infringement, tax compliance 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 – what in the literature is termed 'tax morale' – helps explain these high levels of tax compliance (see, e.g., Lewis, 1982; Roth et al., 1989; Alm et al., 1992, 1999; Pommerehne et al., 1994; Frey, 1997, 2003; Frey and Feld, 2002; Torgler, 2002, 2003, 2005*a*, 2006*a*, 2007). Thus, in line with previous research (see Torgler, 2005*b, c*), we assess the 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 taxes?". The benefit morale (see Halla and Schneider, 2005; Torgler 2006*b*) – that is, the acceptance of claiming government benefits without being entitled to them – we investigate 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

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pedestrian. He asks you to tell the police that he was obeying the speed limit." Thus, our social norm variables are proxies for three different ethical questions in daily life.

The networking aspect of social capital we measure by the level of civic engagement in voluntary work, such as charitable activities, religious and church-related activities, political activities and so forth. This set of social capital variables alone relates not to attitudes but to actual self-reported behaviour. Moreover, such activities generate more intense interactions between people, particularly between group members (Putnam, 2000). This networking aspect is measured by the following question: "How often in the last 12 months did you do volunteer in any of the following areas…?" Obviously, building up a social network through such interactions between people is linked to the degree of trust within a community. In addition, it seems probable that networks might generate positive externalities and thus more trust among and in those people who are not formally part of such organizations; for example, strangers in the community (Putnam, 2000). Nevertheless, evidence for such externalities is not detectable in the empirical literature (for an overview, see Bjørnskov, 2005).

Finally, we investigate happiness, a variable that cannot be interpreted as a social capital variable but that nevertheless has a strong connection with it. Specifically, social networks may have a strong positive impact on happiness (see, e.g., Baker, 2005) and so might generalised trust among people and in institutions. Moreover, in contrast to the other variables, happiness, as alluded to earlier and shown in the next section, is a key variable in the research stream on the impact of relative income position. As such, happiness serves as a type of benchmark variable.

II.III Hypotheses: 'Keeping Up with the Joneses'

This paper aims to test the importance of individuals' positional concerns for societies' level of social capital. In general, the study assumes that individuals' contribution to the creation of social capital and their level of subjective well-being depends on the *negative distance* between their own and the reference group's median income. We formulate our formal hypotheses based on pioneer work in the happiness literature on the impact of relative income position. Thus, our main objective is to develop hypotheses that investigate the consequences on social capital when someone is below the reference income, who is then conjectured to be concerned with her income position. Nonetheless, our research will also provide evidence to which extent an *advantage* in the relative income position affects happiness and social capital. We may observe that an advantage in the relative income position has a positive impact on happiness or social capital. However, it is not per se clear whether we can expect a symmetric or asymmetric relationship. Moreover, it should be noted that previous studies have strongly neglected to investigate this aspect.

The happiness literature has found strong support that positional concerns based on income matter. Not only do Clark and Oswald (1996) suggest that the dependence of happiness on relative income is "one of the most interesting ideas in social science" (p. 359), but Frank and Sunstein (2001) point to "happiness surveys conducted over time in a variety of countries" as "perhaps the most striking evidence of the importance of relative position" (p. 337). Indeed, much happiness research finds strong evidence for the positive impact of an advantageous relative position on subjective well-being (Dorn et al., 2007; Luttmer, 2005; Ferrer-i-Carbonell, 2005).[2] Based on these happiness studies, we first predict the following:

Hypothesis 1: Whether or not individuals are able to keep up with the Joneses' (reference group) affect their subjective well-being. Not being able to keep up with the Joneses' reduces their happiness.

Individuals' positional concerns may also affect their contributions to the generation of social capital. For example, can we claim that they affect the generalized trust level; that is, the mutual trust among people? 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'. Feelings of frustration might equally 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. In other words, feelings of exploitation and deprivation might arise if societal wealth was unequally distributed among its producers in an unfair manner. In 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 the generalized trust and the perceived fairness level. Based on these thoughts, we develop our second hypothesis.

Hypothesis 2: Positional concerns decrease people's trust in others and their perceptions of others' fairness.

In addition, 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 an individual and her government or other institutions that shape society (and implicitly her individual choice set). 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. For example, parliament is linked to the current politico-economic level; the courts and the legal system, to the constitutional level. Because of stronger long-term effects (blaming the 'rules of the game'), we may expect a stronger impact of positional concerns on 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 when people have adjusted their aspiration levels to the long-term determinants of their social position. Moreover, because positional concerns are widely present in the workplace (see, e.g., Layard, 2003; Elster, 1991; Frank and Sunstein, 2001), we may also see an impact on individuals' trust in the environment of business and industry in which they are involved daily. In other words, individuals may blame business or industry for their relative income disadvantage, which could lead to a decreased level of trust in that social sector. On the other hand, trust increases if individuals' have an advantage in the relative income Thus, our *third hypothesis* suggests the following:

> *Hypothesis 3: The disadvantageous relative income position is detrimental to individuals' trust in societal institutions such as the courts, parliament and business and industry.*

In contrast, religious institutions provide moral constitutions for a society. On the one hand, religion acts as a type of 'supernatural police' that provides a certain level of enforced

compliance with socially accepted rules (Anderson and Tollison, 1992). Equally, it encourages the production of social goods such as moral behaviour rooted in, for example, the Ten Commandments (Hull and Bold, 1994). On the other hand (and more specifically), positional concerns may be controlled and restrained by religion. 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 behaviour 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. As regards Christianity, Schoeck (1966) points out the following:

> The ethic taught by the New Testament sought to secure differentiated human existence in a world full of envious people and unlikely to evolve into a society of equals … In the West, the historical achievement of this Christian ethic is to have encouraged and protected, if not to have been actually responsible for the extent of, the exercise of human creative powers through the control of envy. (pp. 159-160)

We can therefore expect that positional concerns may not affect people's trust in churches and religious organization because these provide mechanisms for catalysing the feeling of envy. In addition, all religions have elaborated a sanctioning system that reinforces social values, providing support for toleration of inequality and legitimizing noticeable differences in individual circumstances in the interest of social peace. These observations lead to our fourth hypothesis:

Hypothesis 4: The level of trust in churches and religious organizations should not be affected by relative income concerns.

Social comparisons may also have an impact on willingness to comply with social and legal norms; for example, relative income position may affect willingness to pay taxes (tax morale). As the study by Frey and Torgler (2007), using survey data for 30 European countries, suggests, taxpayers observe the pro-social, complying behaviour of other taxpayers and pay their taxes *conditionally*.[3] The extent to which others also contribute triggers greater or less cooperation and systematically influences an individual's own willingness to comply. As a consequence, we may also observe social comparison mechanisms related to the relative income position for compliance with social norms. A relative disadvantage may lead to a lower tax morale or benefit morale by creating dissatisfaction and a sense of distress over the discrepancy between the actual and the aspired-to financial situation. In such a scenario, cheating the government by not paying taxes and claiming unjustified government benefits might serve as means for an 'illegal' income redistribution by the socially deprived.[4] In general, there is evidence that such positional distress can cause a decrease in the level of tax morale (see Torgler, 2006*a*, 2007). Similarly, Torgler et al. (2006) show empirically that the larger the income differences within a German soccer team, the worse the performance (i.e., effort to comply) of the single players. What about the compliance with criminal and traffic law? If, as previous observations suggest, we can expect social capital to be negatively affected by a disadvantage in relative income position, the same should be observed for a general compliance with law, even if the infringer is a close friend. Thus, our fifth hypothesis is as follows:

Hypothesis 5: Relative income concerns are deleterious to individuals' willingness to obey the law and comply with norms.

Lastly, voluntary participation in political organizations and activities might be caused by an incentive to either express personal preferences or even attempt to change the societal income structure via exerting influence on political institutions. Similarly, an individual may become involved in institutions that correct or deal with relative social disadvantages through charitable (e.g. helping the sick, elderly or poor) or religious and church-related activities, even without benefiting directly from them. Individuals' with a disadvantage in the relative income may try to employ civic engagement as a personal redistribution device likewise. Moreover, some economic models of volunteering assume that people with a high value of time face higher opportunity costs and should be less likely to volunteer (Freeman, 1997). Based on these thoughts, we develop our final hypothesis:

Hypothesis 6: Individuals' active participation in voluntary activities is affected by their relative income position. More specifically, positional concerns may increase the participation in voluntary charity and church work as well as involvement in political organizations.

III. DATA

This analysis uses a cross section of individual data from the 1998 ISSP survey, which contains various questions related to four dimensions of social capital – trust between people and people's trust in social institutions, compliance with norms and creation of networks through civic engagement. In addition, we include the happiness question as a generic measure of social capital. The ISSP survey is a programme of cross-national collaboration on representative surveys covering a wide range of topics for social science research. As the

survey is conducted in several countries, comparative data on values and belief systems among people of different cultural backgrounds can be investigated. Inclusion of a large number of countries in a multivariate cross-national analysis allows to observe robust, culturally and socially independent tendencies, while in the available literature based on individual-level data so far only single countries have been investigated. The categorical dependent variables have been recoded so that higher values correspond to higher levels of social capital. Important to our analysis is the fact that this dataset not only covers approximately 24,000 observations from 26 countries but provides precise information on personal income, our variable of interest. Moreover, this data set allows to control for a wide array of additional socio-demographic factors usually employed in multivariate analyses of issues such as tax morale, health status or life satisfaction (see, e.g., Dorn et al., 2007; Torgler, 2007). To make disposable income comparable across persons, equivalent income is calculated based on the modified OECD equivalence scale (Van Doorslaer and Masseria, 2004). Most important, the individual income is expressed as the individual's share in the benchmark income (y_{is} / y_s). The latter transformation makes individual income independent from national macroeconomic conditions and avoids comparison of absolute income levels across countries. National median income is computed as the median of the personal equivalence income observed in one country, and analogously, as the regional median income for regions. If fewer than 30 observations exist for one region, larger entities are formed for statistical inference.

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 or regional median than for those above. Moreover, regional median income is lower than the median across countries, indicating that an unequal distribution of incomes within countries is present. The descriptive statistics in Table A1 also show that there are as many men as women in our sample, and reports that individuals below

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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 religion denomination. In our sample, more interviewees live in urban areas, and the majority is either employed, or, to a lesser extent, retired. The descriptive statistics in Table A2 indicates that most social capital indicators are measured on a 4- or 5- point scale. Happiness, the three compliance measures tax morale, government benefit morale and, 'rights of friend to wrongful testimony', as well as confidence in institutions show the highest means in the sample, taking into account that the underlying scales are not perfectly comparable. However, on average, engagement in voluntary activities, particularly engagement in politics, provides the lowest values. In addition, the values of the standard deviations differ considerably when they are assessed based on the size of the differing scales or the according sample means.

IV. MODEL AND METHODOLOGY

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

$$Y_{is} = \beta_1 Z_{is} + \beta_2 V_{is} + F_s + \varepsilon_{is} \tag{1}$$

To ensure comparability of the estimation results, computation for the various regressands employs the identical set of control variables (V_{is}). Our variable of interest, relative income position (Z_{is}), is measured as the difference between an individual's income and the reference group income, observed at the aggregate level. In general, using an aggregate reference level is advantageous in that it is exogenously given for the single individual. The vector of control variables at the individual level (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–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 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 included in the model, but captured by country or region fixed effects, 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.[5] For each regression we report the McFadden R2 that ranges between 0 and 1.[6]

Because any differences resulting from variations in the definition of reference income might be interesting, we investigate the relationship between the relative income position and social capital employing a *regional* and *national* income benchmark model.[7] As outlined above, the median income of the reference group seems intuitively appealing for social comparison, particularly in countries in which income is very unequally distributed.[8]

The regional approach takes into account that income levels are not equally distributed within countries and people are more likely to compare their societal position with that of close neighbours than with the rest of the world (Festinger, 1954; Stouffer, 1949). As a consequence, the effect of positional concerns should be more pronounced when observed at the regional level. As counterargument, one can state that migration incentives to move between regions with different general levels of wealth should reduce the emergence of positional concerns at the regional level.[9] In addition, because the estimated coefficients only indicate the direction of the effect and not its magnitude, we also compute marginal effects for the highest level of social capital.

It can be argued that income comparisons are *asymmetric* (Ferrer-i-Carbonell, 2005; Duesenberry, 1949; Holländer, 2001; Frank, 1985). Consequently, the possibility of an asymmetric effect is taken into account through differentiating between the impact for 'poorer' persons from the influence for 'richer' persons, similarly to the approach taken by Ferrer-i-Carbonell (2005, p.1004).[10] Moreover, we might expect a decreasing marginal utility of income for richer, but not poorer, individuals, which we take into account by inclusion of the squared terms of the income differences. Thus, the vector Z_{is} contains the following income variables:

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

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

'poorer'-squared = 'poorer'^2,

'richer'-squared = 'richer'^2.

Econometrically, this model specification has the advantage that it leaves the functional form of the relation between relative income and social capital open, in contrast to when one assumes a linear or log-linear form, as often encountered in happiness studies (e.g. Ferrer-i-Carbonell, 2005). 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.[11] The test results are included in the bottom line of the output tables. In addition, we also estimate a simpler version of the model that excludes the squared terms, assuming that social capital is a linear function of relative income.

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 can affect growth. Moreover, other omitted factors might drive both professional career and the perception of social capital in society likewise.[12] Like in many other cross-sectional happiness studies using individual data, a lack of adequate exogenous variables prevents the use of an instrumental variables approach. Table A4 of the Appendix displays the estimation outcomes for all variables in our model for the happiness question, our most generic measure of social capital, for both the national and regional benchmark model. 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).

Before we turn to the estimation results, we present some preliminary correlation analyses in order to make the reader more familiar with the data. Table A3 displays weighted averages at the country-level of four most prominent and known social capital variables. The highest average happiness levels are reported in mostly English – and Germanic-speaking countries (with the exception of Germany), while the highest average generalized trust scores are observed in Northern Europe (see Knack and Keefer, 1997). In contrast, average confidence in parliament appears quite evenly distributed across geographical and cultural regions, with two transition countries and one Asian country among the upper third group.

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Also the distribution of average tax morale across countries does not follow commonplace stereotypes, as the two highest levels are observed for Japan and Spain. Contrary to expectations, Switzerland, Austria, and Germany are found in the lower bottom of the tax morale distribution. As regards the average frequency of engagement in charity organizations, there seems to be an overrepresentation of English and Nordic language speaking countries in the upper tail. These variations in country-level averages of social capital suggest that we don't observe the existence of an exhaustive set of common institutional or cultural background factors that would sufficiently explain these results, making our chosen fixed effects approach even more important as controlling for all potential aggregate factors would not be realizable.

At the individual level, Spearman's rank correlation coefficients among the four representative social capital variables and happiness show low correlations, not exceeding 0.22 (not reported). Equally, the full correlation matrix shows quite low correlations among the fourteen measures, with only a few exceeding the value of 0.4.[13] The relatively low correlation among the social capital variables suggests that they measure distinct facets, justifying their separate analysis. Regional and national income is highly correlated (rho = 0.96), as are regional and national income differences (overall: 0.92, positive ones: 0.94, negative ones: 0.86). These extremely high correlations suggest that the regional and the national benchmark approaches can be expected to yield similar outcomes.

V. ESTIMATION RESULTS

Tables 1, 3, 5, 7 and 1a, 3a, 5a, and 7a report the results for the case in which the national median income level serves as an individual's benchmark for evaluating his or her relative income position, while Tables 2, 4, 6, 8 and 2a, 4a, 6a and 8a display the outcomes for the

corresponding regional median income. The upper tables present the results when the most flexible functional form is assumed, while the tables at the bottom of each page (denoted with 'a') present the outcomes of the model based on an entirely linear relation. Overall, the Pseudo R2 of 0.06 or higher indicates for all measures of social capital (except for the tax morale regressions) a good fit of the model to the data. Moreover, the values of the Pseudo R2 suggest that estimation of the simpler model (Tables 1a to 8a) is qualitatively more or less equivalent to assuming a more flexible functional form (Tables 1 to 8), at least in terms of this specific measure. Although we allow for non-linearity in the effects of positive and negative income distances, the following discussion focuses on the direction of influence of positional concerns and the asymmetry of a relative income effect.

Happiness

The first dependent variable is our generic measure of social capital, namely 'happiness' (see Tables 1 to 2a). It can be argued that a higher level of social trust, better networks and well-targeted government activities that raise confidence in its institutions might work as transmission channels for citizen well-being. This dependent variable measures respondents' happiness in four categories, with the highest category indicating the highest level of subjective well-being.[14] The results reveal that individual well-being not only declines with a growing income distance for those below the median income level, but also, and equally significantly, increases with growing positive income distances for those above the benchmark income. Thus, for the group below the median income positional concerns seem to be detrimental to subjective well-being. The marginal effects are relatively high for both income distances, but indicate a stronger impact in absolute terms of being *poorer* than of being *richer,* with a probability of reporting the highest happiness level of -16.9 and 1.7 percentage points, respectively. The size of the marginal effect for 'being poorer' is the

largest among all the investigated measures of social capital, which indicates that our benchmark variable, happiness, provides one of the strongest position concern effects. For both positive and negative relative income the significant coefficients of the squared terms reveal the presence of non-linear effects.[15] Thus, the results indicate that the relative income position is important for the well-being of richer and poorer persons likewise and that position concerns are deleterious to subjective well-being, which is in line with our hypothesis 1 and several previous findings in the happiness literature.

Table 1a displays the estimation results for the linear specification. The findings are consistent as both disadvantage and advantage in the relative income position affect the level of life satisfaction in the expected direction, lending support to hypothesis 1. Although the marginal effects of relative income appear to be somewhat smaller (-0.113 compared to -0.169 and 0.015 compared to 0.017, respectively), we still observe *being poorer* to be more detrimental by far than *being richer* to be conducive to happiness, in absolute terms.

Table 2 and 2a provide the results using the regional median level of earning as a reference level. As can be seen, the results are qualitatively similar and lead to identical conclusions. Thus, overall, these findings are consistent with the first hypothesis that having a disadvantage in the relative income position is deleterious to one's happiness.

Tables 1, 1a, 2, and 2a about here

Generalized Trust

The next set of regressands relates to generalized trust, the dimension of social capital that measures whether respondents believe that people in general can be trusted and how they

evaluate the general level of fairness in society. The first question, asks respondents to assess the general degree of other people's fairness towards themselves.[16] A low value for the categorical regressand reflects the view that 'people take advantage all the time', whereas the highest value indicates the answer 'people are fair all the time'. At first sight, the results in Table 1 indicate there does not appear to exist any linkage between relative income position and the level of perceived fairness: the coefficients of almost all income distance variables are not significant at conventional levels, except for the coefficient on the squared positive difference. Although this finding might indicate a potential effect for those with an income above the national median, the Wald-test of the joint significance of the two positive income distance variables does not support this view. In contrast, the Wald-test on the two negative income distance variables shows that relative income might matter for poorer individuals (rejection at the 1 percent level of significance). In support of hypothesis 2, the sign of the income distance below the national median income is negative, with a substantial marginal effect (-3.4 percentage points). Thus, generalized trust seems to decrease with a growing distance of one's earnings to the reference income. This conjecture is corroborated when a simpler linear model is estimated (see Table 1a). In this model, poorer individuals perceive others as acting less fairly the relatively more disadvantaged they are; in other words, positional concerns that might lead to envy appear to destroy social trust. As conjectured before, for positive income differences, no relative income effect is observable. Thus, for individuals' contribution to social trust an asymmetric income effect is detected. The results using the regional median income benchmark model in Table 2 and 2a mirror our previous outcomes perfectly,[17] lending support to hypothesis 2 for the situation in which individuals have a disadvantage in the relative income position.

The second question asks whether people can generally be trusted or whether individuals should be careful.[18] Again, the lowest category indicates a low level of generalized trust (see also Table 1). Based on the significance levels of the individual

coefficients and the outcomes of the Wald-tests, both, negative and positive income distances, appear decisive for the trust level, with influences in the expected direction. While an improved relative income position is conducive to trust, positional concerns, caused by a growing distance between one's own income and the reference group, are deleterious. This finding mirrors closely the result for the happiness variable and supports the predicted impact of positional concerns for social trust (hypothesis 2). That is, the more concerned people are with their relative income position, the less they regard their environment as trustworthy. However, although the direction of the effect appears symmetric, the marginal effects indicate that the effect is substantially (almost 40 times) more influential for persons below the median income than for those above, both in terms of statistical significance and magnitude (-0.038 compared to 0.001). Moreover, non-linearity in the income effects is present, as the significant estimates of the squared income terms indicate.[19] In contrast, estimation of the simple model corroborates the finding for negative income distances but disguises the significant impact of positive income differences, rendering its coefficient insignificant (see Table 1a). Clearly, assuming a linear function potentially misrepresents the true relation between income and generalized trust, yielding distorted estimation outcomes. Again, Table 2 and 2a show that defining the benchmark at the regional level we find supportive and less ambiguous results for the more flexible model specification, now clearly rendering the coefficients of both income distances significant.[20] Again, we observe that the marginal impact is larger, in absolute terms, for persons with an income below the regional median than for those above, and the simple model equally shows that relative income matters for poorer individuals only (see Table 2a).

Overall, the results for the two generalized trust variables clearly show that a disadvantage in the relative income position generates positional concerns that are destructive for an individual's contribution to this dimension of social capital. On the other hand, persons who are better off than their reference group develop more trust in their social environment.

The effects are stronger when the income difference is negative, rather than when it is positive, and equally when the benchmark is at the national level rather than at the regional. This finding lends strong support to hypothesis 2.

Trust in Institutions

The third set of dependent variables measures the confidence in institutions – specifically, the parliament, courts, business and the church – that represents the quality of the relationship between government and the respondent (see Tables 3 to 4a). Again, higher values for these variables indicate a higher level of vertical trust.[21]

Confidence in parliament, displayed in Table 3, is solely influenced by the relative income position when the income is below the national median income level (at the 1 percent of significance), exerting a marginal effect of -1.6 percentage points). In contrast, having an income higher than the reference group does not appear to affect one's confidence in the national legislature, showing therefore an asymmetric impact. The estimation results equally reveal non-linearity of the relative income effect for 'poorer' persons. Positional concerns appear again detrimental to this dimension of social capital when the simpler specification is employed (at the 1 percent level), while richer individuals' confidence level does not appear affected. The estimation outcomes of the regional income model are perfectly consistent with the national income model. This income effect, although asymmetric, supports hypothesis 3 that the relative income matters and gives rise to the interpretation that (non-beneficial) changes in the short-term determinants of one's social position by the legislature are deleterious to an individual's trust relation with the government.

Interestingly, we observe a similar asymmetric pattern when investigating confidence in courts and the legal system. The results of both, the simpler and the more flexible model, reveal that – for incomes below the median – confidence in courts is negatively related to the

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relative income position: the relatively poorer the individuals, the less they trust country's justice system (at the 1 percent significance level). While the coefficient estimate for the squared negative income distance indicates the presence of a non-linear income effect for the disadvantaged, the Wald-test confirms the non-decisiveness for the positive relative income distances. Qualitatively identical observations are made when using the regional median income (Tables 4 and 4a). Overall, the model for confidence in courts mirrors the previous results using confidence in the parliament as dependent variable perfectly. Nevertheless, it is interesting to note that the marginal effects are twice as high as those for confidence in parliament. Clearly, positional concerns that destroy public trust in institutions are more severe for those institutions that presumably act more independently and more objectively than those institutions that are more subject to political business and re-election cycles, such as the national parliament. These gaps in marginal effects for the two institutions persist when the regional income is used in place of the national income (-2.9 compared to -1.7 percentage points).

The level of expressed 'confidence in business and industry' is significantly altered by the distance change between individual income and national benchmark income (on either side of the median income), showing support for hypothesis 3. However, again, the sizes of the marginal effects imply a certain asymmetry, as the trust-generating effect of an increase in positive distances is almost 20 times lower in absolute terms than the destructive influence of a rise of negative income differences (-1.9 percentage points compared to 0.1 percentage points). These main findings are corroborated by the regression outcomes for the simpler specification in Table 3a and when the reference income is calculated at the regional level (see Tables 4 and 4a). Qualitatively, the impact of a having a disadvantage in the relative income position is comparable to the one observed for the other institutional trust variables, while a trust generating effect of a positive income distance is only yielded for this facet of social capital. Clearly, these findings lend strong support to hypothesis 3.

Turning to the empirical test of hypothesis 4, the results are in line with our expectations that confidence in churches and religious organizations is completely unrelated to any income distance (either negative or positive). This result is supported by the two Wald-tests of the joint significance (despite the significance of the squared positive income distance). Imposing a linear functional form on the linkage between relative income and social capital corroborates that having an *advantage* in the relative income position does not affect self-report confidence in churches. However, it also renders the coefficient on 'poorer' significant, implying that persons with an income *disadvantage* express higher levels of confidence in this institution. In contrast, when using the regional benchmark income, while the outcomes of the more flexible specification are well mirrored (particularly by the Wald-tests), the positional income effect for poorer persons in the simpler model cannot be corroborated. Thus, preferring the model where a more flexible functional form of the income effect is assumed, we conclude that there is no relative income effect, possibly reflecting the (presumably) non-profit nature of this institution.

In sum, trust in the parliament, courts, and business appear sensitive to changes in a disadvantage in the relative income position. On the other hand, confidence in churches is not affected by income distances.

Tables 3, 3a, 4, and 4a about here

Compliance with Social Norms

The next dimension of social capital, compliance with norms, is measured by tax morale, government benefit morale and the subjective right of a friend to unlawful testimony as protection against state prosecution (Tables 5 to 6a).

The first regressand, the 'tax morale' measure, relates to the respondent's view on whether it is morally wrong to report income taxes incorrectly.[22] The lowest category reflects the answer "not wrong", while the highest category indicates "seriously wrong". While the estimates show that a negative income distance has no impact on tax morale, the willingness to pay taxes appears to decrease with a growing positive distance between the individual's income and the national median benchmark level at an increasing rate. These estimation outcomes indicate an asymmetric income effect. Furthermore, they also contrast our previous findings in this paper with respect to the direction of influence of income advantages. The results of the simpler model (with no squared terms), reported in Table 5a, corroborate our previous finding that an increase in the positive income distance lowers the propensity to pay taxes honestly, as indicated by the negative sign. Thus, positional income effects for individuals above the median income are probably present, although with a relatively small marginal impact (-0.5 percentage points in the linear model).

However, using regional median income as benchmark, no significant influences of any income variable are observable. Both the Wald-tests and the regression assuming a linear function corroborate this finding. In consequence, preferring the regional model over the national, the tendency is that the level of tax morale does not seem to depend on the relative income position at all.[23] Previous empirical studies of tax morale or tax compliance have yielded no robust relationship between levels of absolute income and tax morale, (see, e.g., Torgler, 2007), confirming our own findings.[24] However, the non-decisiveness of absolute or relative income position for a person's tax morale does not necessarily mean that other measures partly relating to one's financial situation do not matter (see Torgler, 2007). More

specifically, the question remains whether a relative income advantage is correlated with a tax morale raising financial satisfaction, thus *indirectly* contributing to social capital, that potentially compensates a *direct* compliance decreasing impact of income, rendering its total influence insignificant. In sum we can conclude that hypothesis 5 is rather rejected when looking at tax morale.

Contrasting results are obtained in the case of the second measure for compliance with social norms – namely whether it is morally wrong to give incorrect information to obtain government benefits[25]. For this regressand, we observe that acceptance of cheating the government increases (non-linearly) with a worsened relative income position as measured by the growing negative income distance form the national median and the joint significance of the negative income variables at the 1 percent level (Table 5). The impact of destructive positional concerns is with -12.9 percentage points quite sizeable and the direction of its influence is in line with hypothesis 5. No income position effect, however, is observed for those who are better off than the median person in society. The findings for the simple model corroborate the previous finding showing a strong deleterious influence of positional concerns for those below the median income (significant at the 1 percent level), but not for those above (Table 5a).

However, the outcome for the regressand 'benefit morale' when the regional median income is employed reveals a more differentiated picture (see Table 6 and 6a). While the significant estimates of being 'poorer' lead to conclusions supporting hypothesis 5, contrasting findings are obtained for positive income differences. The coefficient estimates for the positive income distances suggest that persons with an income advantage have a higher propensity to comply with social norms, also being non-linear in nature. As for previous measures of social capital, the marginal effects for 'poorer' persons exceed those observed for 'richer' persons by far in absolute terms (-12.5 percentage points compared with 0.8 percentage points). However, the Wald-test cannot reject the null hypothesis that both

positive income distance variables are jointly insignificant. This conclusion is then supported by the results of the simple linear model as only positional concerns of the deprived appear decisive, being in line with hypothesis 5. Overall, our results reveal that a relative income disadvantage is detrimental to the willingness to comply with norms, while income advantages tend not to affect this facet of social capital. Consequently, the tendency is not to reject hypothesis 5, claiming that the relative income affects willingness to be honest.

In the case of the regressand for the third measure of compliance with social norm – whether close friends have the right to you giving wrongful testimony aimed at lowering their punishment – the lowest category reflects the answer "he has a definite right" and the highest, "he has no right".[26] Again, the highest category corresponds with the highest level of social capital in terms of obeisance to the law.

Interestingly, the results for the simple and the flexible national benchmark model suggest that positional concerns do not matter for compliance with norms relating to the criminal code enacted by the national legislature (Tables 5 and 5a). In other words, both financially advantaged and disadvantaged persons do not substantially differ in their social attitudes in that respect. Furthermore, employing the regional income model, all regressions equally support the view that compliance to norms stipulated in the criminal code does not depend on individuals' relative income position (Tables 6 and 6a). Hence, the overall tendency is to reject hypothesis 5 for social capital measured by the unwillingness to give wrongful testimony.

Tables 5, 5a, 6, and 6a about here

Overall, the results obtained for the social norm 'compliance' are very mixed. While the findings for the two measures 'tax morale' and 'giving wrongful testimony' suggest that relative income does not matter, thus rejecting hypothesis 5, the results for 'benefit morale' strongly support the deleterious impact of positional concerns driven by relative income. It might well be that cheating the government for obtaining payments is most closely linked to improving one's financial situation through accessible means. Instead, the willingness to evade taxes may well depend stronger on individuals' occupation (opportunity set), the structure of the tax system (progression, captured by the fixed effects), and the risk aversion that affects their perceptions of deterrence (audit probability and fine rate). As regards the obeisance to the (criminal) law, individuals' relative income position is less likely to be connected to the situation of giving wrongful testimony to finally determine her propensity. Note also the comparatively low Pseudo R2 values particularly for the tax morale regression (0.0398), the lowest of all estimated models. In sum, the overall tendency is rather to reject hypothesis 5.

Social Networks

The last set of regressands is linked to social networks that form a decisive part of social capital. These are measured particularly by the frequency of the interviewee's voluntary participation in politics, charitable activities, religious activities and other kinds of voluntary work. Again, a higher value for the dependent variable reflects more frequent involvement in such activities.[27]

The regression results show no influence of the relative income position on the propensity to engage in voluntary work in political activities on either side of the benchmark level. This finding is supported by both the Wald-tests and the estimation results for the simple model. Using the regional median income as benchmark level the model yields

qualitatively identical results. Thus, in contrast to our expectations, engagement in politics is not affected by the relative income position, rejecting hypothesis 6.

Voluntary work in charity organizations such as the Red Cross and the Salvation Army appears to increase with relative income distance of those who are relatively better off than the median person in society, while the estimates for 'poorer' persons suggest that positional concerns do not matter. However, as the Wald-test rejects the null hypothesis of joint insignificance of the negative income variables at the 5 percent level, for poorer persons, a growing income distance seems to trigger a lower propensity to become socially active. For both groups non-linear effects appear present. For 'richer' persons the propensity to engage voluntarily increases with income distance at a decreasing rate, while for 'poorer' positional concerns affect civic engagement at an increasing rate. These estimation results are corroborated and even stronger by corresponding findings for the model using the regional median income as the reference point. Thus, that positional concerns appear to lower the frequency of social engagement in charity organisations contradicts hypothesis 6. Although it should be noted that the marginal effects with -0.010 (-.002, respectively) are not very high for negative income distances, they are still dominating those for having an income advantage (.003 and .004, respectively). In the simple model, the result for the engagement rising impact of a positive income distances is supported (see Tables 7a and 8a). However, for persons below the regional median income, a positive effect becomes dominant that contrasts the regressions outcomes for the more flexible functional form (Table 8).[28] Following previously developed arguments, however, misspecification of the true functional form might well bias the coefficients in the linear specification. In sum, these first results suggest that hypothesis 6 has to be rejected.

Turning to religious activities in Table 7 and 7a (national median income benchmark model), at first sight, positional concerns do not to appear to affect any individual's frequency of participation.[29] This result is supported when using the simpler model specification.

Estimating the model using the regional median income, however, the Wald-test on the negative income variables suggests that positional effects are present for poorer persons (rejection of nonsignificance at the 5 percent level). The positive coefficient of the negative income distance suggests a stronger involvement in activities relating to religion organizations when the relative income disadvantage increases, at an increasing rate. Indeed, the estimation outcome of the simple model corroborates this effect (coefficient 'poorer' is significant at the 1 percent level, Table 8a).[30] Thus, here there is evidence that is in support of hypothesis 6.

Finally, the frequency of activities in other kinds of voluntary works kinds seems not be affected by the relative income position, when the national median income is employed as reference level, as both the flexible and the simple model suggest (see Table 7 and 7a). In contrast, when using the regional median income, the estimation results with the flexible model specification indicate that the relative income effects is asymmetric: for richer persons the propensity to get engaged in other organizations increases with relative income (at the 5 percent level), with a 0.2 percentage point increase in the probability to report the highest level of engagement when relative income rises by 1 percentage point. Although the Wald-test suggests that the effect is rather linear, a similar, albeit weaker result is obtained when estimating the simple model (significant at the 10 percent level). Thus, relative income effects of the more affluent appear, again, conducive to the social engagement dimension of social capital, measured by the frequency of voluntary work for 'other organizations'. In contrast, positional concerns of those individuals with an income below the benchmark do not appear to affect their civic engagement in 'other organisations', contradicting hypothesis 6.

Overall, for social engagement in political, charity, religious, or other organisations, the overall tendency is to reject hypothesis 6 that stated that positional concerns increase the propensity of civic engagement. In our estimation results, a relative income effect becomes more visible when the regional median income rather than the national income level is used as

the benchmark. Under both benchmark specifications, political activities appear symmetrically not influenced by relative income, while engagement in charity, religious, and other organizations appear affected by the relative income position. Particularly, for more affluent individuals we observe stronger involvement in civic engagement in 'other' and 'charity' organizations. These results are in line with some previous studies that have shown that a more privileged social status is often correlated with higher levels of voluntarism and civic participation (for an overview see Hwang et al., 2005).

In contrast, positional concerns of the deprived reduce frequency of participating in charity organizations while increasing that in religion organizations. These results might well indicate that engagement in politics is more driven by ideological positions and world views rather than individuals' financial situation, while the one-dimensional focus of charity and other organisation on 'social/re-distributional' activities provides additional, potentially non-financial benefits for richer people (e.g. gains in reputation).

Tables 7, 7a, 8, and 8a about here

In sum, looking at both benchmark models, we find in many cases that, in line with Ferrer-i-Carbonell (2005), income comparisons are not symmetric and any income effect is not *per se* linear. Only in a few cases the propensity of richer persons to contribute to social capital increases with relative income, while the deleterious effect of positional concerns is revealed for about two thirds of the chosen facets of social capital (see also Table 9). In addition, we observe larger marginal effects (in absolute values) for positional concerns, namely when an individual's income is below the benchmark income, than for income advantages for those above the benchmark income, with the first being up to 40 times larger

than the latter in absolute values. Moreover, the findings using two different reference groups are robust and consistent: the estimation outcome does not change substantially no matter whether regional or national income variables are employed. For all social capital dimensions, the direction of impact is not affected by the choice of benchmark model. Differences do emerge, however, with respect to the marginal impact, which in most cases appears larger when the national level is employed as the reference point, while significance levels are often higher when using the regional model. Table 9 provides a concise overview of the findings of our empirical analysis.

Table 9 about here

VI. CONCLUSION

The importance of relative preferences is not a new concept. 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 focus mainly on its impact on happiness. Nevertheless, some laboratory experiments have investigated the consequences of positional concerns for individuals' social behaviour (see, e.g., Kirchsteiger, 1994), and some field studies indicate the influence of relative income position on, for example, employer performance or employment decisions (see, e.g., Torgler et al., 2006; Neumark and Postlewaite, 1998).

Paldam (2000) correctly points out that the social capital literature is a "new field, (but) suffering from a great lack of good, reliable data. Both time series and cross-country evidence are missing. In the meantime much speculation is going on" (p. 649). This current international cross-sectional study, using the rich ISSP 1998 international data covering 26 countries and about 32,000 individuals, goes beyond several previous studies that focused on

a single country. In our case we are able to abstract the impact of cultural, institutional and macroeconomic differences across countries, generating more reliable results. Thus, our paper contributes to the social capital literature in general and the cross-sectional research in particular by (1) analyzing the impact of relative income concerns on the creation of social capital using two different reference groups and (2) employing 13 different questions to measure social capital along four different dimensions: general trust between people, trust in institutions, compliance with social norms, and civic engagement in form of voluntary activities. In addition, we also include self-reported happiness, which serves as our benchmark measure.

In general, we find empirical support that relative income matters (see Table 9). In most cases, we find the coefficient measuring an interviewee's relative income position statistically significant, with considerable marginal effects. Only compliance with some specific norms (tax laws and criminal law), and voluntary work for political organizations appear to be free of positional concerns. Most particularly, confidence in churches appears unrelated to relative income. The strongest relative income effect is observable for happiness (with a marginal effect up to -16.9 percentage points), followed by compliance with social norms (not unjustifiably claiming government benefits) (with marginal effects up to -12.9), and, with a gap, generalized trust (marginal effect of -3.8). For these three measures, social capital or happiness rises with an improved relative income position and declines with a disadvantage in the relative income position. We also find substantial effects for confidence in the courts and the legal system, institutions which are less related than other variables to the *current* politico-economic process. Obviously, these institutions, unlike the national parliament and the private sector (business and industry) in which many citizens interact and work in their daily life, are more vulnerable to a positional effect. Less visible is a relative income effect for confidence in religious institutions the participation political organizations.

We find the tendency that the relative income effect is not symmetric. The negative effect appears more sizeable for those individuals below the reference income by far than the positive impact for those people that are above the reference income. Moreover, the results are not affected by the chosen reference group (national versus regional income), although it should be noted that the quantitative effects of the relative income position is more sizeable when using the national one as reference income.

Acknowledgements

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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] Other contributions include Easterlin (1974, 1995, 2001), Clark and Oswald (1996), Watson et al., (1996), Groot and van den Brink (1999), Tsou and Liu (2001), McBride (2001), Lyubomirsky (2001), Stutzer (2004), and Kingdon and Knight (2004).

[3] More specifically, Frey and Torgler (2007) show that if taxpayers believe tax evasion to be common, their tax morale decreases. If, however, tax payers believe others to be honest, their tax morale increases.

[4] 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.

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

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

[7] Estimation with the regional and national subsistence income and a graphical representation of main income effects are reported in Fischer and Torgler (2006*a*, 2006*b*).

[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.

[9] On the other hand, one might argue that modern communication and media caused an extension of one's reference group now relating to the country's median person rather to the regional median.

[10] 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.

[11] 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.

[12] 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, optimist persons might view their peers as more trustworthy, on the one hand, and be more financially successful, on the other.

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

[14] Original question: "If you were to consider your life in general these days, how happy or unhappy would you say you are, on the whole". Possible answers were "very happy", fairly happy", "not very happy" and "not at all happy".

[15] For positive income differences we detect a decreasing marginal utility of income, a result in line with other life satisfaction studies that use national individual data (e.g. Dorn et al., 2005).

[16] Original question: "How often do you think that people would try to take advantage of you if they got the chance and how often would they try to be fair?". Possible answers were "try to take advantage of me all of the time", "try to take advantage most of the time", "try to be fair most of the time" or "try to be fair almost all of the time".

[17] Indeed, as the coefficient on the positive squared income variable becomes now insignificant in the more flexible specification and the Wald-test does not reject the hypothesis of joint insignificance (Table 2), the results for the regional benchmark income are even less ambiguous compared to the previous results in Table 1.

[18] 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".

[19] For negative differences in income, the coefficient reveals an increasing marginal trust; whereas for positive differences, the estimate indicates a decreasing marginal trust. Again, this result mirrors the findings for the happiness variable.

[20] On the other hand, the decisiveness of the squared term of the negative difference is now disguised but, again, revealed by the Wald-test on the two income variables.

[21] 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".

[22] 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".

[23] In contrast, Fischer and Torgler (2006*a*, 2006*b*) report a compliance increasing impact of relative income. They use, however, a different definition of reference income level.

[24] There was, however, a tendency for a negative relationship, implying that higher income is associated with a lower tax morale, somewhat in line with our results for the national median income (Table 5).

[25] 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.

[26] 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".

[27] Related question: "Have you done any voluntary activity in the last 12 months in any of the following areas? Voluntary activity is unpaid work, not just belonging to an organization or group. It should be of service or benefit to other people or the community and not only to one's family or personal friends. During the last 12 months, did you do volunteer work in any of the following areas: (a) Political activities (helping political parties, political movements, election campaigns, etc.), (b) charitable activities (helping the sick, elderly, poor, etc.), (c) religion and church-related activities (helping churches and religious groups), and (d) any other kind of voluntary activities?". Possible answers were (1) no, (2), yes, once or twice, (3) yes, 3–5 times, (4) yes, 6 or more times. When answering these questions, respondents were asked to list one voluntary activity only once, even when several categories might apply.

[28] Even when employing the national benchmark model, the coefficient on the negative income distances turns positive, with significance at the 10 percent level.

[29] Fischer and Torgler (2006*b*) show that some types of engagement depend on the overall wealth of a country. In our model, which focuses solely on effects of individual income, however, this GDP-effect is captured by the country and region fixed effects.

[30] Already when using the national median income, in the simple model the coefficient on 'poorer' becomes significant at the ten percent level (Table 8a)

Tables

Table 1

National Median Income as a Benchmark for Social Comparison: Social Trust

	Happiness Coeff.	Marg. eff.	Advantage Coeff.	Marg. eff.	Gen. trust Coeff.	Marg. eff.
'poorer'	-0.698**	-.169**	-0.155	-.034	-0.521**	-.038**
	[6.72]		[1.50]		[5.12]	
'poorer' squared	0.377*	.091*	-0.111	-.024	0.464**	.033**
	[2.45]		[0.72]		[3.07]	
'richer'	0.070**	.017**	-0.015	-.003	0.020	.001
	[6.82]		[1.70]		[1.92]	
'richer' squared	-0.000**	-.000*	0.000*	.000*	-0.001*	-.000*
	[4.37]		[2.02]		[2.53]	
Observations	25525		23777		25623	
Pseudo R2	0.1016		0.0633		0.0747	
Wald-test ('poorer' vars.)	153.13**		36.42**		49.15**	
p-value	0.00		0.00		0.00	
Wald-test ('richer' vars.)	46.84**		4.68		6.46*	
p-value	0.00		0.10		0.04	

Notes: Ordered probit estimation with country fixed effects. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-percent levels, respectively.

Table1a

National Median Income as Benchmark for Social Comparison: Social Trust

	Happiness Coeff.	Marg. eff.	Advantage Coeff.	Marg. eff.	Gen. trust Coeff.	Marg. eff.
'poorer'	-0.467**	-.113**	-0.218**	-.048**	-0.246**	-.018**
	[12.28]		[5.90]		[6.86]	
'richer'	0.060**	.015**	-0.007	-.002	-0.001	-.000
	[5.96]		[1.26]		[0.14]	
Observations	25525		23777		25623	
Pseudo R2	0.1013		0.0633		0.0743	

Notes: See Table 1.

Table 2

Regional Median Income as Benchmark for Social Comparison: Social Trust

	Happiness Coeff.	Marg. eff.	Advantage Coeff.	Marg. eff.	Gen. trust Coeff.	Marg. eff.
'poorer'	-0.651**	-.156**	-0.114	-.025	-0.351**	-.024*
	[6.15]		[1.08]		[3.39]	
'poorer' squared	0.382*	.092*	-0.111	-.024	0.259	.018
	[2.37]		[0.69]		[1.68]	
'richer'	0.098**	.023*	-0.000	-.000	0.046**	.003**
	[8.55]		[0.02]		[3.44]	
'richer' squared	-0.002**	-.000**	-0.000	-.000	-0.002	-.000
	[2.94]		[0.57]		[1.94]	
Observations	25525		23777		25623	
Pseudo R2	0.1092		0.0695		0.0849	
Wald-test ('poorer' vars.)	121.06**		22.74**		28.01**	
p-value	0.00		0.00		0.00	
Wald-test ('richer' vars.)	86.53**		0.57		13.21**	
p-value	0.00		0.75		0.00	

Notes: Ordered probit estimation with region fixed effects. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-percent levels, respectively.

Table 2a

Regional Median Income as Benchmark for Social Comparison: Social Trust

	Happiness Coeff.	Marg. eff.	Advantage Coeff.	Marg. eff.	Gen. trust Coeff.	Marg. eff.
'poorer'	-0.427**	-.103**	-0.186**	-.040**	-0.215**	-.015**
	[11.05]		[4.87]		[5.77]	
'richer'	0.078**	.019**	-0.004	-.001	0.015	.001
	[8.04]		[0.48]		[1.67]	
Observations	25525		23777		25623	
Pseudo R2	0.1087		0.0695		0.0846	

Notes: See Table 2a

Table 3

National Median Income: Confidence in Institutions

	Parliament		Courts		Business		Church	
		Marg.		Marg.		Marg.		Marg.
	Coeff.	eff.	Coeff.	eff.	Coeff.	eff.	Coeff.	eff.
'poorer'	-0.342**	-.016**	-0.410**	-.035**	-0.508**	-.019**	0.056	.007
	[3.50]		[4.21]		[5.15]		[0.57]	
'poorer' squared	0.325*	.015*	0.394**	.034**	0.375**	.014**	0.018	.002
	[2.21]		[2.76]		[2.61]		[0.12]	
'richer'	-0.002	-.000	-0.003	-.000	0.038**	.001**	-0.014	-.002
	[0.27]		[0.34]		[4.45]		[1.76]	
'richer' squared	0.000	.000	0.000	.000	-0.000**	-.000**	0.000*	.000*
	[0.62]		[0.72]		[4.05]		[2.05]	
Observations	25018		25144		24579		24919	
Pseudo R2	0.0582		0.0595		0.0663		0.1129	
Wald-test								
('poorer' vars.)	20.64**		28.11**		63.98**		3.54	
p-value	0.00		0.00		0.00		0.17	
Wald-test								
('richer' vars.)	4.32		3.89		20.77**		4.60	
p-value	0.12		0.14		0.00		0.10	

Notes: Ordered probit estimation with country fixed effects. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-percent levels, respectively.

Table 3a

National Median Income: Confidence in Institutions

	Parliament		Courts		Business		Church	
	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.
'poorer'	-0.134**	-.006**	-0.155**	-.013**	-0.289**	-.011**	0.075*	.009*
	[3.81]		[4.47]		[8.13]		[2.11]	
'richer'	0.001	.000	0.002	.000	0.019*	.001*	-0.006	-.000
	[0.33]		[0.38]		[2.26]		[1.25]	
Observations	25018		25144		24579		24919	
Pseudo R2	0.0582		0.0594		0.0659		0.1129	

Notes: See Table 3.

Table 4

Regional Median Income: Confidence in Institutions

	Parliament		Courts		Business		Church	
	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.
'poorer'	-0.377**	-.017**	-0.353**	-.029**	-0.399**	-.014*	0.023	.003
	[3.69]		[3.53]		[3.93]		[0.23]	
'poorer' squared	0.343*	.015*	0.288	.024	0.237	.008	0.034	.004
	[2.20]		[1.93]		[1.57]		[0.22]	
'richer'	-0.009	-.000	-0.004	-.000	0.060**	.002**	-0.018*	-.002*
	[0.93]		[0.44]		[5.86]		[2.02]	
'richer' squared	0.000	.000	0.000	.000	-0.001**	-.000**	0.000*	.000*
	[1.15]		[1.13]		[3.42]		[2.04]	
Observations	25018		25144		24579		24919	
Pseudo R2	0.0663		0.0688		0.0762		0.1202	
Wald-test								
('poorer' vars.)	25.62**		26.56**		49.70**		1.46	
p-value	0.00		0.00		0.00		0.48	
Wald-test								
('richer' vars.)	1.38		2.35		34.92**		4.53	
p-value	0.50		0.31		0.00		0.10	

Notes: Ordered probit estimation with region fixed effects. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-percent levels, respectively.

Table 4a

Regional Median Income: Confidence in Institutions

	Parliament		Courts		Business		Church	
	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.
'poorer'	-0.159**	-.007**	-0.168**	-.014**	-0.272**	-.010**	0.051	.006
	[4.36]		[4.71]		[7.48]		[1.39]	
'richer'	-0.003	-.000	0.001	.000	0.037**	.001**	-0.011	-.001
	[0.44]		[0.22]		[4.21]		[1.61]	
Observations	25018		25144		24579		24919	
Pseudo R2	0.0662		0.0688		0.0759		0.1202	

Notes: See Table 4.

Table 5

National Median Income: Compliance with Social Norms

	Tax morale Coeff.	Marg. eff.	Benefit morale Coeff.	Marg. eff.	Right of friend Coeff.	Marg. eff.
'poorer'	-0.155	-.056	-0.328**	-.129*	0.192	.061
	[1.56]		[3.12]		[1.44]	
'poorer' squared	0.152	.055	0.195	.077	-0.271	-.085
	[1.05]		[1.28]		[1.34]	
'richer'	-0.024**	-.009**	0.004	.002	-0.012	-.004
	[2.95]		[0.48]		[1.23]	
'richer' squared	0.000**	.000**	-0.000	-.000	0.000	.000
	[2.75]		[0.92]		[1.22]	
Observations	25268		25532		22544	
Pseudo R2	0.0398		0.0541		0.074	
Wald-test ('poorer' vars.)	3.72		30.32**		2.07	
p-value	0.16		0.00		0.36	
Wald-test ('richer' vars.)	9.81**		1.60		1.52	
p-value	0.01		0.45		0.47	

Notes: Ordered probit estimation with country fixed effects. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-percent levels, respectively.

Table 5a

National Median Income: Compliance with Social Norms

	Tax morale Coeff.	Marg. eff.	Benefit morale Coeff.	Marg. eff.	Right of friend Coeff.	Marg. eff.
'poorer'	-0.047	-.017	-0.206**	-.081**	0.027	.008
	[1.33]		[5.53]		[0.55]	
'richer'	-0.013*	-.005*	0.001	.000	-0.007	-.002
	[2.17]		[0.21]		[1.22]	
Observations	25268		25532		22544	
Pseudo R2	0.0397		0.0541		0.0739	

Notes: See Table 5.

Table 6

Regional Median Income: Compliance with Social Norms

	Tax morale		Benefit morale		Right of friend	
	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. Eff.
'poorer'	-0.138	-.050	-0.315**	-.125**	0.198	.061
	[1.36]		[2.93]		[1.46]	
'poorer' squared	0.131	.050	0.223	.088	-0.305	-.094
	[0.87]		[1.41]		[1.49]	
'richer'	-0.017	-.006	0.020*	.008*	-0.019	-.006
	[1.82]		[1.99]		[1.45]	
'richer' squared	0.000	.000	-0.001*	-.000*	0.000	.000
	[0.89]		[1.96]		[1.18]	
Observations	25268		25532		22544	
Pseudo R2	0.0515		0.0679		0.0911	
Wald-test						
('poorer' vars.)	3.08		21.97**		2.26	
p-value	0.15		0.00		0.35	
Wald-test						
('richer' vars.)	3.83		4.54		2.13	
p-value	0.21		0.10		0.32	

Notes: Ordered probit estimation with region fixed effects. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-percent levels, respectively.

Table 6a

Regional Median Income: Compliance with Social Norms

	Tax morale		Benefit morale		Right of friend	
	Coeff.	Marg. eff.	Coeff.	Marg. eff.	Coeff.	Marg. Eff.
'poorer'	-0.052	-.019	-0.183**	-.072**	0.011	.003
	[1.45]		[4.75]		[0.22]	
'richer'	-0.013	-.005	0.011	.004	-0.015	-.005
	[1.82]		[1.52]		[1.65]	
Observations	25268		25532		22544	
Pseudo R2	0.0515		0.0678		0.0910	

Notes: See Table 6.

Table 7

National Median Income: Voluntary Work

	Politics		Charity		Religion		Other	
	Coeff.	Marg. eff.	Coeff.	Marg. Eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.
'poorer'	-0.101	-.003	-0.088	-.010	0.083	.003	-0.234	-.028
	[0.58]		[0.73]		[0.55]		[1.84]	
'poorer' squared	0.176	.005	0.276	.032	0.024	.001	0.350	.042
	[0.71]		[1.58]		[0.11]		[1.87]	
'richer'	0.008	.000	0.028**	.003**	0.001	.000	0.004	.000
	[0.61]		[3.41]		[0.12]		[0.32]	
'richer' squared	-0.000	-.000	-0.000**	-.000**	-0.000	-.000	-0.000	-.000
	[0.98]		[3.07]		[0.19]		[0.56]	
Observations	25708		25741		25676		25516	
Pseudo R2	0.0693		0.0775		0.2291		0.1005	
Wald-test								
('poorer' vars.)	0.55		6.79*		3.35		3.58	
p-value	0.76		0.03		0.19		0.17	
Wald-test								
('richer' vars.)	1.03		11.74**		0.05		0.33	
p-value	0.60		0.00		0.98		0.85	

Notes: Ordered probit estimation with country fixed effects. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-percent levels, respectively.

Table 7a

National Median Income: Voluntary Work

	Politics		Charity		Religion		Other	
	Coeff.	Marg. eff.	Coeff.	Marg. Eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.
'poorer'	0.004	.000	0.076	.009	0.097	.004	-0.014	-.002
	[0.07]		[1.77]		[1.83]		[0.30]	
'richer'	0.001	.000	0.015*	.002*	0.000	.000	0.002	.000
	[0.16]		[2.31]		[0.04]		[0.29]	
Observations	25708		25741		25676		25516	
Pseudo R2	0.0692		0.0773		0.2291		0.1004	

Notes: See Table 7.

Table 8

Regional Median Income: Voluntary Work

	Politics		Charity		Religion		Other	
	Coeff.	Marg. eff.	Coeff.	Marg. Eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.
'poorer'	-0.075	-.001	-0.023	-.002	0.134	.005	-0.037	-.002
	[0.42]		[0.19]		[0.86]		[0.28]	
'poorer' squared	0.215	.003	0.300	.032	0.019	.001	0.151	.009
	[0.83]		[1.65]		[0.08]		[0.76]	
'richer'	0.016	.000	0.039**	.004**	-0.007	-.000	0.034*	.002*
	[0.97]		[3.72]		[0.47]		[2.32]	
'richer' squared	-0.001	-.000	-0.001**	-.000**	-0.000	-.000	-0.002	-.000
	[0.97]		[3.09]		[0.18]		[1.59]	
Observations	25708		25741		25676		25306	
Pseudo R2	0.0911		0.0928		0.243		.1087	
Wald-test								
('poorer' vars.)	1.65		16.27**		6.76*		1.93	
p-value	0.44		0.00		0.03		0.38	
Wald-test								
('richer' vars.)	1.11		13.91**		1.17		5.40	
p-value	0.57		0.00		0.56		0.07	

Notes: Ordered probit estimation with region fixed effects. Marginal effects calculated at the average

for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-

percent levels, respectively.

Table 8a

Regional Median Income: Voluntary Work

	Politics		Charity		Religion		Other	
	Coeff.	Marg. eff.	Coeff.	Marg. Eff.	Coeff.	Marg. eff.	Coeff.	Marg. eff.
'poorer'	0.049	.001	0.155**	.016**	0.145**	.005**	0.042	.002
	[0.78]		[3.45]		[2.62]		[0.87]	
'richer'	0.005	.000	0.026**	.003**	-0.008	-.000	0.016	.001
	[0.47]		[3.07]		[0.76]		[1.93]	
Observations	25708		25741		25676		25306	
Pseudo R2	0.091		0.0926		0.243		0.1086	

Notes: See Table 8.

Table 9

Overview of Regression Results of the national and regional income models

	Social Trust			Confidence in Institutions				Compliance with social norms				Voluntary Work		
	Happiness	Advantage	Gen. trust	Parliament	Courts	Business	Church	Tax morale	Benefit morale	Rights of friend	Politics	charity	religion	Other
Flexible functional form														
'poorer'	-	(-)	-	-	-	-			-			(-)	(+)*	
'poorer squared'	+	(-)	+**	+	+	+			(+)			(+)	(+)*	
'richer'	+		+*			+	-**	-**	+*			+		+*
'richer squared'	-		-**			-	+	+**	-*			-		
Linear functional form														
'poorer'	-	-	-	-	-	-	+*		-			+*	+*	
'richer'	+					+		-**				+		

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. Exceptions are denoted with '*' and '**', respectively. * significant only in the regional income model, ** significant only in the national income model.

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 equivalised V216
National median income (y_s)	0.42	0.68	0.00	2.13	See above
,poorer' $y_s - y_{is}$ if $y_{is} < y_s$	0.17	0.23	0.00	0.99	See above
,poorer' squared	0.08	0.15	0.00	0.97	See above
,richer' $y_{is} - y_s$ if $y_{is} \geq y_s$	0.44	1.56	0.00	139.26	See above
,richer' squared	2.63	127.37	0.00	19393.27	See above
Regional median income (y_s)	0.36	0.60	0.00	2.27	See above
,poorer' $y_s - y_{is}$ if $y_{is} < y_s$	0.16	0.23	0.00	0.98	See above
,poorer' squared	0.08	0.15	0.00	0.96	See above
,richer' $y_{is} - y_s$ if $y_{is} \geq y_s$	0.45	1.19	0.00	68.40	See above
,richer' squared	1.62	33.26	0.00	4678.68	
Control variables					
Female	0.53	0.50	0	1	V200
Age 30–39	0.22	0.42	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	13.47	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	2.37	2.06	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	0.23	0	1	V217
No denomination	0.23	0.42	0	1	V217
Buddhist	0.02	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 25525 observations in the happiness regressions. 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
Happiness	25525	2.91	0.74	1	4	V4
Advantage	23777	2.67	0.86	1	4	V18
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
Right of friends	22544	2.67	0.59	1	3	V63
Voluntary work – politics	25708	1.11	0.47	1	4	V32
Voluntary work – charity	25741	1.46	0.91	1	4	V33
Voluntary work – religion	25676	1.29	0.77	1	4	V34
Other voluntary work	25516	1.47	0.94	1	4	V35

Table A3

Descriptive Statistics for the 25 Countries Included

Country	Freq.	Percent	Happiness	Generalized trust	Confidence in parliament	Tax morale	Engagement in charity organization
Germany	1,463	5.73	2.86	2.32	2.40	2.66	1.19
USA	1,077	4.22	3.24	2.49	2.73	3.13	1.67
Austria	658	2.58	3.12	2.44	2.70	2.48	1.16
Hungary	817	3.2	2.45	2.20	2.73	2.98	1.25
Italy	601	2.35	2.82	1.97	2.21	2.99	1.27
Netherlands	1,487	5.83	3.24	2.66	3.04	2.83	1.61
Norway	1,243	4.87	3.10	2.86	3.11	3.02	1.61
Sweden	849	3.33	3.09	2.74	2.67	3.20	1.52
Czech Republic	692	2.71	2.88	2.43	2.00	3.12	1.38
Slovenia	680	2.66	2.74	1.86	2.17	3.11	1.53
Poland	965	3.78	3.02	2.09	2.26	3.02	1.52
Bulgaria	938	3.67	2.44	1.98	2.00	3.20	1.34
Russia	1,039	4.07	2.44	1.97	2.03	2.37	1.26
New Zealand	783	3.07	3.27	2.53	2.15	3.05	1.83
Canada	615	2.41	3.08	2.47	2.41	3.11	1.95
Philippines	1,063	4.16	3.03	2.12	3.40	2.97	2.08
Israel	831	3.26	2.98	2.05	2.46	2.88	1.65
Japan	1,044	4.09	3.02	2.22	2.03	3.41	1.26
Spain	1,570	6.15	3.03	2.27	2.78	3.36	1.26
Latvia	987	3.87	2.44	1.98	2.08	2.62	1.58
Slovak Republic	1,120	4.39	2.62	1.87	2.75	3.03	1.49
France	865	3.39	2.89	2.23	2.32	2.74	1.56
Portugal	1,073	4.2	2.70	2.11	2.56	3.06	1.27
Chile	1,241	4.86	2.81	1.88	2.37	2.98	1.45
Denmark	885	3.47	3.20	2.70	2.71	3.14	1.21
Switzerland	939	3.68	3.19	2.69	2.92	2.76	1.43
	25,525	100	2.912	2.274	2.501	2.970	1.473

Notes: Weighted averages of the social capital variables are calculated for the countries and observations of the happiness regression model.

Table A4

Determinants of Happiness

	National reference income		Regional reference income	
	Coeff.	z-value	Coeff.	z-value
'poorer'	-0.698**	[6.72]	-0.651**	[6.15]
'poorer squared'	0.377*	[2.45]	0.382*	[2.37]
'richer'	0.070**	[6.82]	0.098**	[8.55]
'richer squared'	-0.000**	[4.37]	-0.002**	[2.94]
Female	0.017	[1.08]	0.018	[1.11]
Age 30-39	-0.217**	[8.42]	-0.222**	[8.58]
Age 40-49	-0.381**	[13.87]	-0.390**	[14.18]
Age 50-59	-0.445**	[14.98]	-0.456**	[15.34]
Age 60-69	-0.394**	[10.61]	-0.407**	[10.89]
Age 70-79	-0.356**	[8.08]	-0.373**	[8.42]
Age > 80 years	-0.201**	[2.68]	-0.217**	[2.88]
Level of education	0.174**	[5.34]	0.176**	[5.36]
Level of education squared	-0.013**	[4.03]	-0.014**	[4.08]
Single	-0.378**	[16.31]	-0.387**	[16.58]
Separated or divorced	-0.463**	[15.94]	-0.472**	[16.26]
Widowed	-0.500**	[16.07]	-0.505**	[16.11]
Church attendance	0.044**	[10.36]	0.044**	[10.37]
Catholic	0.032	[0.64]	0.037	[0.74]
Jewish	0.644**	[4.92]	0.114	[0.62]
Protestant	0.137**	[2.74]	0.129*	[2.57]
Orthodox	0.131	[1.92]	0.131	[1.91]
No denomination	-0.003	[0.06]	-0.002	[0.04]
Buddhist	0.049	[0.66]	0.077	[1.01]
Muslim	-0.004	[0.04]	0.072	[0.64]
Urban area	-0.006	[0.30]	-0.001	[0.05]
Rural area	0.058**	[2.71]	0.063**	[2.84]
Self-employed	0.077**	[2.75]	0.072*	[2.57]
Unemployed	-0.328**	[9.02]	-0.329**	[8.97]
Retired	-0.019	[0.63]	-0.019	[0.61]
Housewife	0.063*	[2.07]	0.060*	[1.97]
Disabled	-0.341**	[5.79]	-0.340**	[5.75]
Out of labour force	0.019	[0.25]	0.018	[0.23]
Observations	25525		25525	
Pseudo R2	0.1016		0.1092	
Wald-test (all religious denominations)	70.82**		31.57**	
p-value	0.00		0.00	

Notes: Ordered probit estimation with country or region fixed effects, respectively. Marginal effects calculated at the average for the highest category of the social capital variable. **, * denote significances at the 1-, and 5-,-percent levels, respectively.

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