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Inequality and well-being in transition economies: A non-experimental test of inequality aversion *

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Abstract

This paper examines the link between inequality and individual well-being using household survey data from 27 Transition Economies, where income inequality increased considerably since 1989. A test of inequality aversion in individual preferences that draws on the Fehr and Schmidt (QJE, 1999) specification of inequality aversion is proposed, and the difficulties of implementing it in a non-experimental setting are discussed. Estimates based on this model confirm aversion to inequality both in the overall sample and in the regional sub-samples. The Gini index, on the other hand, is unable to capture this negative effect of inequality on well-being. Notably, inequality aversion is not intrinsic. Rather, it appears to be tied to a concern with the fairness of the institutions underlying the distribution of fortunes in society. The evidence is suggestive of inequality of opportunity driving attitudes toward overall inequality. Perceiving inequality to be unfair is also associated with calls for strong government involvement in redistributive policies.

Keywords: inequality aversion, relative deprivation, subjective well-being, transition economies.
JEL classification: D63, I32, P20.

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"All societies are inegalitarian. But what is the relation between the inequalities in a society and the feelings of acquiescence or resentment to which they give rise?" (W.G. Runciman, 1972:3)

1 Introduction

On October 15, 2011 *Occupy* protests that originated with the *Occupy Wall Street* movement in New York were planned in over 80 countries and 950 cities worldwide. These protests are perhaps the most vivid manifestation of the growing global concern with equity and inequality, also reflected in China's pledge to create a "harmonious society", or in the indicators underpinning European Union's "social inclusion agenda", or in the recommendation of the Sarkozy Commission (on the Measurement of Economic Performance and Social Progress) that "[q]uality-of-life indicators in all the dimensions covered should assess inequalities in a comprehensive way." (Stiglitz, Sen and Fitoussi, 2009). This concern is driven in part by the oftentimes sharp increase in the gap between the rich and the poor over the past two decades in many OECD countries, in China, and in Eastern Europe. Yet, the mapping from a given statistical measure of inequality to preferences for redistribution, or to individual (social) welfare, and the importance of tradeoffs between the size of the pie and the inequality in its distribution will be influenced by the prevailing degree of inequality aversion in society.[1] The latter is the subject of this paper.

Some evidence of aversion to inequality can be inferred from the preferences for equity that have been observed in tightly controlled lab experiments, where individuals have been observed to have strong other-regarding preferences, to prefer equitable outcomes, and to engage in cooperation (see Fehr and Schmidt 2006 for a comprehensive review of the literature). These other-regarding preferences have been observed in a number of different games, such as ultimatum games (Thaler, 1988; Camerer and Thaler, 1995), public goods games with punishments (Fehr and Gachter, 1996), or gift exchange games (Fehr, Gachter, and Kirchsteiger, 1997), as well as in other contexts.

This paper investigates, rather, the degree of inequality aversion based on nationally representative household survey data. Evidence on this is more scarce and generally looks at associations between inequality, usually measured in terms of some statistical index like the Gini index, and subjective well-being using household survey data (Tomes 1986; Clark 2003; Alesina et al. 2004; Senik 2004; Graham and Felton 2006; Grosfeld and Senik 2010). A negative association between inequality and well-being is viewed as indicative of inequality being a welfare-relevant consideration

[1] In the case of social welfare, the normative degree of inequality aversion in the social welfare function will also play a crucial role (Sen 1997 provides a detailed discussion).

in the population. The motivation behind this line of research stems from the argument that aversion to inequality, by its nature, offers only a limited scope for revealed choice analysis, but more progress could be made by analysing expressed preferences. These studies reach mixed conclusions, inequality having either a positive, a negative, or no statistically discernible effect on individual well-being.

This paper suggests that if aversion to inequality is driven by social mobility considerations or by differences in status between self and relevant others, then aggregate statistical indices of inequality will be unable to capture in a meaningful way changes in status implicit in inequality dynamics. An alternative test of inequality aversion is adopted, that is better able to capture, I believe, status-driven aversion to inequality. The test builds on the model of inequality aversion proposed in the experimental literature by Fehr and Schmidt (1999), which is closely related to earlier work on relative deprivation by Yitzhaki (1979). The proposed specification, while intimately related to the Gini index, allows us to make progress in settings where aggregate measures of inequality are less appealing.

Several findings emerge from this study. First, individuals are found to exhibit aversion to inequality (in the sense of Fehr and Schmidt, 1999), and this result holds across a number of specifications, and also across regional subsets of countries. The Gini index, on the other hand, is unable to capture this negative effect of inequality on well-being. Second, inequality aversion does not appear to be intrinsic, but rather stems from a sense of fairness, as captured by opinions vis-a-vis the main determinants of success and economic need in society. As such, the findings are suggestive of inequality of opportunity being the factor that is driving the individuals' responses to economic inequality. Finally, perceiving inequality to be unfair is also associated with calls for strong government involvement in redistributive policies.

Section 2 reviews existing findings on inequality and subjective well-being, discusses the proposed methodology and addresses some of the difficulties of testing for inequality aversion with large household survey data. Section 3 describes the survey data employed in the empirical analysis. Section 4 presents the main findings, discusses the driving forces behind inequality aversion, and considers implications for social welfare and support of redistributive policies. Section 5 concludes.

2 Social evaluation, inequality aversion, and reference groups

2.1 Existing literature

The primary aim of this paper is to test for inequality aversion using nationally-representative survey data. In the existing literature there are two types of studies that share this goal, at least to some degree. First, there are several recent studies that run experiments on populations that go beyond the usual student setting. Guth, Schmidt and Sutter (2007) implement a three-person ultimatum game experiment through the German weekly *Die Zeit*. A total of 5,132 readers took part in the experiment, thus offering a much greater variation in socio-economic and demographic characteristics in the participant group. Their findings suggest considerable parallelism between student and non-student behaviour, and thus help address the common objection that university students who typically take part in laboratory experiments are not representative of the general population. Bellemare et al. (2008) implement an ultimatum game relying on a representative sample of the Dutch population drawn from the participants of the CentERpanel (2,000 households) and find that young and highly educated subjects have lower aversion to inequality than other groups.

Pirttila and Uusitalo (2010), using a representative survey of Finnish people, present survey respondents with a 'leaky bucket' experiment in which they probe the respondent's willingness to have the tax schedule adjusted to effect a transfer from the top income decile to the bottom income decile. In addition, the authors also ask respondents to compare the Finnish wage distribution to alternative distributions with a higher mean and dispersion of income. While they find evidence in support of inequality averse preferences, the results also suggest differences between the two approaches - a large group of respondents who supported more narrow wage differences do not support costly progressive transfers. The authors also find inequality aversion to be strongly associated with attitudes to increased tax progression, with increased unemployment insurance and unemployment assistance benefits, and with increased income support.

A somewhat larger, albeit still limited, literature looks at the association between individual well-being and statistical measures of income inequality. This question is apart from the larger literature that examines whether relative status concerns, such as those embodied in the relation of someone's income to mean (or median) reference group income, or in someone's rank in the income distribution, are relevant for individual well-being (Clark and Oswald 1996; McBride 2001; Ravallion and Lokshin 2002; Blanchflower and Oswald 2004; Ferrer-i-Carbonell 2005; Luttmer 2005; Graham and Felton 2006; see also Clark et al. 2008 for a recent review of the literature). The relevant question here is whether conditional on own income, and conditional on relative income, the degree

of inequality in the distribution of incomes in a given group has an effect on individual well-being. Existing studies that explore the relationship between inequality and welfare based on household survey data generally model individual well-being – proxied by a measure of self-reported happiness or life satisfaction – as a function of the Gini index or some other composite inequality measure. As already noted, they arrive at mixed results.

Tomes (1986), using survey data from Canada, finds higher levels of inequality (as measured by the income share of the poorest 40 percent of the population) to be positively associated with life satisfaction among men, controlling for own income and average income in the district of residence. Clark (2003) similarly finds, using data from the British Household Panel Survey, that well-being is positively correlated with reference group income inequality measured by either the Gini coefficient or the 90th / 10th percentile ratio.

On the other hand, Alesina et al. (2004), relying on US GSS survey data from 1972-1997, and Eurobarometer data for 1975-1992, find that inequality (measured by the Gini coefficient) has a negative effect on happiness, controlling for own income and a number of socio-demographic characteristics, albeit the relationship is less precisely estimated in the US sample. They also find a strong negative effect of inequality on happiness among the poor and the political left in Europe, but not in the United States. A negative association between inequality and subjective evaluations of the economic situation is found in the Grosfeld and Senik (2010) study on Poland, but only for the second half of the transition period (1997-2005), whereas a positive association is found in the early years (1992-1996).

Graham and Felton (2006), relying on Latinobarometro data from 18 countries in Latin America find country-level inequality measured by the Gini index to not have a statistically significant effect on happiness. Senik (2004), relying on panel data from the Russian Longitudinal Monitoring Survey, finds that neither national level inequality (measured by either Gini or Stark indices), nor the regional or Primary Sampling Unit inequality, have a significant effect on reported life satisfaction in Russia.

2.2 Proposed methodology

Imagine an increase in the Gini index of income inequality for a given group from, say, $G_1 = 0.22$ to $G_2 = 0.29$. Assume further that the group in question is the relevant reference group (more on this below) and that the inequality in the income space is the relevant dimension for well-being evaluation. Should we expect this sizable increase in the Gini index to have an effect on individual well-being? The answer to this question depends in part on whether individuals are averse to inequality, and

if so, on the nature of this aversion. If aversion to inequality is based on its perception as a social evil (Alesina et al. 2004), then higher inequality should reduce the (individual) well-being of all irrespective of the underlying changes in the income distribution that precipitated the increase in inequality, or of the individuals' position in this income distribution. If, on the other hand, aversion to inequality is driven by perceptions of social mobility, aggregate national measures of inequality may be limited in their ability to capture the subtle effects of inequality on prospects of social mobility (Graham and Felton, 2006).

Similarly, if inequality aversion is driven by status considerations that are sensitive to the distribution of incomes in the group and not just the individual's position in the income distribution, then aggregate measures of income distribution will provide little useful information on implicit changes in status. Returning to the above increase in the Gini index, consider instead the income distribution $A_1 = \{100, 200, 300\}$ that corresponds to $G_1$and $A_2 = \{100, 200, 400\}$ that corresponds to G_2. For someone with the income equal to 100, for instance, the change in relative standing embodied in the income gaps between her and others in A_2 relative to the initial distribution A_1 is much more explicit. The relative standing of the person whose income increases from 300 to 400 actually improves as inequality increases. It seems plausible for these bilateral differences between group members to be important factors determining well-being (if status considerations matter), even if composite inequality indices generated by these are not, in themselves, meaningful indicators of inequality of status.

These bilateral gaps form the basis of the relative deprivation measure proposed by Yitzhaki (1979). Given a range of incomes $(0, y^*)$, Yitzhaki defines the total deprivation of someone with income y_i is the sum inherent in all units of income the person is deprived of, or incomes in the interval (y_i, y^*):

$$D(y_i) = \int_{y_i}^{y^*} (z - y_i) f(z) dz = \int_{y_i}^{y^*} [1 - F(z)] dz$$

where $F(y) = \int_0^{y*} f(z)dz$ is the cumulative income distribution. This definition is a formalisation of the concept of relative deprivation proposed by Runciman (1972). Yitzhaki further shows that the degree of relative deprivation within a given group is the product of the group's mean income and its Gini index of inequality (G), such that:

$$G = \frac{1}{\mu} \int_0^{y^*} D(z) f(z) dz$$

A number of studies establish a negative relationship between Yitzhaki's measure of relative deprivation $D(y_i)$ and individual well-being (D'Ambrosio and Frick, 2007) or health outcomes within groups (Deaton, 2001; Eibner and Evans, 2005). On the other hand, if one were to model individual well-being as a function of the Gini index of inequality, this implicitly assumes that an individual's utility (proxied by the self-reported well-being score) depends not only on the relative deprivation of that individual, which may be a reasonable assumption, but also - and with equal weights - on the relative deprivation of all other individuals in a given reference group. The latter assumption is much more stringent.

In light of the above considerations, this paper adopts an empirical test of inequality aversion in individual preferences that is able to pick up inequality aversion driven by status considerations such as those consistent with Yitzhaki's relative deprivation measure. The analytical set-up follows the specification proposed in the experimental literature by Fehr and Schmidt (1999, hereafter FS), who introduce inequality aversion into individual preferences as follows (using Yitzhaki's notation):

$$U(y_i) = y_i + \alpha \int_{y_i}^{y^*} (z - y_i) f(z) dz + \beta \int_{0}^{y_i} (y_i - z) f(z) dz$$

where $y = y_1, ..., y_n$is the vector of monetary payoffs, n is the number of players, and it is further assumed that $-1 < \beta \leq 0$ and $\alpha \leq \beta$ (i.e. α is more negative than β).[2] Thus, the individual's welfare depends on income comparisons with the incomes of all other individuals in the reference group. The second term on the right measures the utility loss associated with disadvantageous inequality, and the third term measures the utility loss from advantageous inequality. The assumption $\alpha \leq \beta \leq 0$ implies that utility loss is greater from disadvantage (i.e. there is loss aversion), which is also in line with the findings of prospect theory that individuals oftentimes evaluate outcomes as deviations (losses or gains) from a certain reference point, and prefer avoiding losses more than acquiring gains (Kahneman and Tversky, 1979).[3] In the context of this paper $\beta < 0$ can indicate aversion to inequality due to the uncertainty of social mobility prospects (especially worries about possible downward mobility), and is also consistent with a preference for fairness with respect to the fortunes of the poor.

Fehr and Schmidt (1999) show that many of the manifestations of fair and cooperative behaviour

[2]Note a small change of notation from the FS formulation in order to make it easier to relate the structural parameters of the model to the estimates in Section 4. In Fehr and Schmidt (1999) the second and third terms are subtracted from y_i, and, respectively, $0 \leq \beta < 1$, and $\alpha \geq \beta$.

[3]Technically, loss aversion implies that that the disutility in the domain of losses is greater than the utility gain in the domain of gains, whereas Fehr and Schmidt assume disutility from both disadvantageous and advantageous inequality. They note that allowing for $\beta < 0$ (equivalent to $\beta > 0$ in our notation) does not alter equilibrium behaviour in games they consider, albeit in principle, there is no reason why individuals cannot receive satisfaction over the domain of incomes lower than their own.

in experimental studies, such as those observed in ultimatum games (Thaler, 1988; Camerer and Thaler, 1995), public goods games with punishments (Fehr and Gachter, 1996), or gift exchange games (Fehr, Gachter, and Kirchsteiger, 1997) can be explained if a fraction of subjects are inequality averse in the above sense. In particular, they note that "[t]his utility function can rationalize positive and negative actions towards other players. It is consistent with generosity in dictator games and kind behavior of responders in trust games and gift exchange games, *and at the same time* with the rejection of low offers in ultimatum games. It can explain voluntary contributions in public good games *and at the same time* costly punishments of free-riders." (Fehr and Schmidt, 2006:640)

The advantage of using the FS specification is that the test for inequality aversion is based on a self-regarding utility function that only considers the relative deprivation of self, and not of all others in the reference group. It is also easily observed that the FS specification is intimately related to Yitzhaki's concept of relative deprivation - the second term in the FS utility function is Yitzhaki's measure of relative deprivation $D(y_i)$, and the last term is a similar measure of normalised aggregate income gap, but defined over incomes that are lower than the income of the individual i. If we take Yitzhaki's measure of relative satisfaction $S(y_i)$, defined as: $S(y_i) = \int_0^{y_i}[1 - F(z)]dz$, then the third term in the FS utility function is $\int_0^{y_i}(y_i - z)f(z)dz = y_i - S(y_i)$. Thus, the FS utility function can be written as:

$$U(y_i) = y_i + \alpha D(y_i) + \beta(y_i - S(y_i))$$

As Yitzhaki's notes further, $D(y_i) = \mu - S(y_i)$, and substituting into the above equation, we can rewrite $U(y_i)$ equivalently as a function own income, relative income, and Yitzhaki's relative deprivation, which is the specification used in section 4 of this paper:

$$U(y_i) = y_i + \beta(y_i - \mu) + (\alpha + \beta)D(y_i)$$

A further advantage of using the FS specification in a cross-sectional setting stems from the fact that it allows us to investigate the relationship between inequality and well-being at the level of the individual. A regression of individual well-being on a group inequality measure (e.g. Gini or Theil index) in a cross-section essentially looks at the relationship between the mean well-being level in a group and the group's level of inequality because there is no within-group variation in the inequality measure. In principle, a negative association between life satisfaction and the group inequality index would be consistent with the "social evil" hypothesis. There is, however, an alternative explanation

consistent with this negative relationship. Consider $v(y_i)$, which is a concave function of individual income alone. The concavity of the individual utility function will imply a negative relationship between mean group life satisfaction and group inequality (Atkinson, 1970), even though at the individual level inequality has no bearing on well-being.

The link between Yitzhaki's relative deprivation and inequality is established by Hey and Lambert (1980). In particular, fix mean group income μ and consider two income distributions F_1 and F_2 where F_1 Lorenz dominates F_2, in other words F_2 is more unequal than F_1. Hey and Lambert show that there will be more relative deprivation at every level of income under F_2. Since inequality averse preferences imply that $\alpha + \beta < 0$, higher inequality associated with F_2 will have a negative effect on individual well-being at every level of income. If, on the other hand, $\alpha + \beta = 0$ and there is no aversion to inequality, higher relative deprivation under F_2 would have no effect on individual well-being (see also Deaton 2001).

A number of difficulties arise, however, when translating the FS specification to an empirical setting based on large household survey data, namely: (i) whether inequality in the general population could be expected to produce an evaluative response that could be captured in an empirical test; (ii) what is the relevant group over which the inequality measure is to be defined; and (iii) the nature of an appropriate welfare metric. These issues are discussed in more detail below. It is important to note, however, that these difficulties are not specific to the FS specification alone; all of them apply equally to any study that proposes to examine the relationship between individual life satisfaction and economic inequality defined for some chosen reference group.

2.3 Relevant reference groups

In laboratory experiments, the relevant reference group is obvious in games involving two subjects, and most theories of other-regarding preferences in n-person games assume the remaining $n-1$ actors to form the relevant reference group (Fehr and Schmidt, 2006). It is much less clear what the relevant reference groups are in the general population for purposes of social comparisons, and there is little consensus in the literature on this issue. In Veblen's description of conspicuous consumption behaviour the reference level of consumption was set by the affluent (Veblen 1994, originally published in 1899). Duesenberry (1949) in formulating the *relative income hypothesis*[4] took the neighbours as the group against which relative status is being assessed. The *social comparison theory* proposed by Festinger (1954) suggested that individuals seek to compare their abilities/opinions with others who

[4]The hypothesis is that individual's attitude toward consumption and saving is motivated by his/her income and consumption relative to the income and consumption of others, rather than by some abstract standard of living.

are perceived to be similar in relevant dimensions. In this spirit, Van de Stadt et al. (1985) rely on age, education and employment status as the relevant attributes for social comparison.

In more recent studies that investigate the effect of relative status on well-being, a number of different reference groups have been employed such as a first stage regression to predict reference income based on a set of characteristics like age, education, occupation and area of residence (Clark and Oswald 1996; Senik 2004), as well as reference groups based on age cohorts (Deaton 2001; McBride 2001), age, education, and region (Eibner and Evans 2005; Ferrer-i-Carbonell 2005), area of residence such as US state (Blanchflower and Oswald 2004) or the Public Use Microdata Areas from the US Census (Luttmer 2005), city of residence (Ravallion and Lokshin 2002), country (Graham and Felton 2006) or even adjacent countries (Diener et al. 1995).

Abundance of various approaches notwithstanding, the true reference groups are ultimately unobserved. This paper follows Frank and Levine (2007) in assuming that the inequality within a person's reference group varies directly with the amount of inequality within the respondent's place of residence. As Frank and Levine argue, 'the within-reference group level of inequality for an individual is likely to correspond more closely to the degree of inequality in the city in which [the person] lives than to the degree of inequality in his home country' (Frank and Levine 2007:13). Senik (2004) similarly suggests that people may be ignorant with regard to the distribution of income at the national level.

There is indeed some empirical evidence suggesting that reference groups are likely to be local. Graham and Felton (2006) find the effect of relative status in Latin America to be strongest at the city level as compared to the country level. Knight et al. (2009), in an unique study that actually asks respondents in rural China to define their reference groups, find that most respondents (68 percent) compare themselves to others within their village (including immediate neighbours), and only 11 percent of respondents report reference groups that stretch beyond village limits. Kuhn et al. (2011), relying on data from the Dutch postcode lottery, find exogenous income shocks to affect consumption behaviour only for immediate neighbours.

For these reasons, the empirical analysis relies on reference groups based on the Census Enumeration Areas (CEA) from which the household was drawn, which is the most localised reference group allowed by the data. While the primary sampling units vary in size across and within countries, they are rather local, sampled households representing a few thousand inhabitants on average (see Synovate 2006 for details of the LiTS sampling methodology).

2.4 Evaluative space and status observability

Even if we can agree on a definition of a relevant reference group, this still leaves two key questions: (i) what is the relevant space over which relative status is considered; and (ii) whether relative status of any given member of the reference group - however defined - is observable to other members of that group. In the ultimatum game or in the public goods game the relevant inequality is unambiguously defined over the sum of money that is being considered in the experiment. In our case, the relevant space for status considerations is less clear cut, and likely multidimensional. Relative deprivation concerns may involve not just wealth, but also education, political participation, etc. This is separate from the question "equality of what", considered by Amartya Sen in the 1979 Tanner Lectures, which was concerned with the relevant space over which equality should be considered for purposes of justice (Sen, 1980). In the philosophical inequality literature it has been suggested that the relevant space over which inequalities matter (for justice) should be resources (Rawls 1971; Dworkin 1981), opportunity for welfare (Arneson 1989), access to advantage (G.A. Cohen 1989), opportunities for a good life (Arneson 2000); capabilities (Sen 1980), or opportunities (Roemer 2000).

In this paper the concern is not with a normative criterion of redistribution, but rather with the relationship between perceptions of relative deprivation based on status. In this paper the space over which relative deprivation is measured is that of per capita household expenditures. The choice is both pragmatic and is based on the need for status to be observable. This is because differences in objective well-being between an individual and other members of her reference group can only give rise to a sense of relative deprivation if these differences are both observed and perceived to be relevant. If one's neighbours are better off, but the individual does not perceive them as such, then there is no obvious reason why she should feel relatively deprived. Status observability is thus required for an empirical test of inequality aversion to pick-up a non-spurious correlation between inequality and some measure of welfare. Inequalities in wealth, arguably a salient dimension for purposes of social comparisons, are also considerably easier to observe than inequalities in education or political participation. Whereas inequalities in wealth can in principle be captured by both income and expenditure data, the latter gets us much further along the observability spectrum than income data, particularly because income tends to be poorly measured in developing countries and, more importantly, because income is primarily observable when it is spent.

Finally, defining reference groups at the local level also makes it more likely that that distribution of wealth would be observed. As Lichtenberg (1996: 295) argues, "literal neighbors sometimes have a special significance because [...] one is confronted by their houses, their yards, and their cars."

2.5 Adaptation

Sen (2000) argues that individuals may come to terms with their deprivation, even report reasonable levels of life satisfaction. Thus, even if the level of inequality is observable, it still may not have a discernible effect on well-being, in the sense of inequality aversion, because of adaptive preferences. While this is indeed a valid critique, and while there is evidence of adaptive preferences (Frederick and Loewenstein 1999; Easterlin 2001; Stutzer 2004; Di Tella et al. 2007), adaptation is commonly incomplete, and tends to be more prominent over gains than over losses (Arkes et al, 2006). Furthermore, Sen's critique pertains primarily to chronic deprivation. With respect to inequality, this critique would be stronger in a region like Latin America, where a high degree of inequality has been a long-standing phenomenon, but less so in Eastern Europe, where inequality increased rapidly over a relatively short period of time. In Russia, for instance, the level of inequality, as measured by the Gini index, increased from 0.26 in 1990 to 0.41 in 2003, and a number of other transition economies (Armenia, Estonia, Latvia, and Moldova) experienced increases in inequality of similar magnitude (Mitra and Yemtsov, 2006). Milanovic similarly notes that over the past twenty years there has been a 'dramatic shift in the role of Eastern European / Former Soviet Union (FSU) countries from an "inequality reducing" world middle class to an "inequality increasing" downwardly mobile group' (Milanovic, 2005: 44).[5]

The rapid transformation after the collapse of the Soviet Union, and the increase in inequality that accompanied it make the experience of transition economies particularly conducive to the analysis undertaken in this paper, because it is in times of rapid change when inequality is most likely to elicit an evaluative response. Runciman similarly notes that relative deprivation is most likely to be heightened when things get sharply better or sharply worse, whereas '[i]t is only poverty which seems irremediable that is likely to keep relative deprivation low' (Runciman 1972: 22, originally published in 1966).

2.6 Specifying a welfare metric

In order to empirically test for inequality aversion in the general population, a measure of utility is needed. Following a growing literature on relative status concerns and inequality, this study relies on self-reported life satisfaction (Clark and Oswald 1996; McBride 2001; Ravallion and Lokshin 2002, 2010; Blanchflower and Oswald 2004; Senik 2004; Ferrer-i-Carbonell 2005; Graham and Felton 2006; Luttmer 2006; Senik and Grosfeld 2010). While issues such as interpreting self-reported satisfaction

[5]Milanovic refers to the contribution of the Eastern European / FSU states to the international unweighted inequality measure, or what he calls *concept 1 inequality*.

scores, relating these scores to the concept of utility, or whether self-reported measures of subjective well-being are an adequate measure of human welfare are not trivial,[6] it is important to note that studies undertaken to date produce encouraging results in terms of the viability of subjective well-being measures. For instance, Diener et al. (1995) examined four subjective well-being surveys in a total of 55 countries with a combined population of 4.1 billion people and a total survey sample of 100,000 respondents, and found "strong covariation among surveys, despite different years, sample populations, wording, and response formats." The authors further conclude that at least with regard to self-reported measures of well-being, various scales for measuring subjective well-being tend to yield similar results across countries, a conclusion that is further strengthened by the finding that objective variables can predict measures of subjective well-being across countries.[7] Frey and Stutzer (2001) reach a similar conclusion. A number of other studies have similarly found (i) strong positive associations between measures of subjective well-being and income, health, marriage and employment, and also between well-being reported by the respondent and assessments of the respondent's well-being by friends, relatives, or the interviewer; and (ii) that current subjective well-being measures can predict future behaviour such as marital break-up, or job quits (for a detailed review of these studies see Clark et al. 2008).

3 Data

The analysis relies on data from the Life in Transition Survey (LiTS), conducted jointly by the World Bank and the EBRD in 2006. The survey covers 27 transition economies, as well as Turkey and Mongolia. In each of the countries a nationally representative sample of 1,000 households was selected for face-to-face interviews. The advantage of the LiTS is that it builds on a consistent sampling methodology across countries. Within each household the head of household was interviewed about household expenditures and composition, and the "last birthday" rule was applied to randomly choose the household member (who could also be the household head) for the remaining modules of the survey.

The consumption aggregate recorded in the survey is based on household expenditures over a 30 day period on (i) food, beverages and tobacco; (ii) clothing and footwear; (iii) transport and communication; and (iv) recreation, entertainment, meals outside the home, etc.; as well as (v) education; (vi) health; (vii) furnishings; (viii) household durable goods; and (ix) other expenditures, categories

[6] On these issues, see Frey and Stutzer (2001); Kimball and Willis (2006); Di Tella and MacCulloch (2006); Clark et al. (2008). On the issue of whether happiness data can be viewed as useful indicators of human welfare, see Deaton (2007) for a dissenting view.

[7] Diener et al (1995).

(v)-(ix) being recorded based on a 12 month recall period. These expenditures are recorded in US Dollars and normalized by household size to construct annual per capita household expenditures. A common concern with consumption estimates based on a recall module (relative to the gold standard of a personal diary) has to do with accuracy (Beegle et al 2010; see also Deaton and Zaidi 1999). Zaidi et al. (2009) compare the welfare aggregate from the LiTS survey to the welfare aggregates constructed from more detailed Household Budget Surveys (HBS) and the Living Standards Measurement Study (LSMS) surveys used by the World Bank to compute official poverty estimates for the Europe and Central Asia (ECA) region. They conclude that the 'LiTS consumption aggregate provides a credible welfare metric with which to paint the profile of variation in living conditions across ECA' (Zaidi et al 2009: 39).

The survey also records the respondent's opinion on the minimum amount of money required to make ends meet at the end of the month "living in this dwelling and doing what you do." This measure of welfare, expressed in USD, is similarly converted to per-capita equivalents.

The measure of relative deprivation is constructed by computing the aggregate gap between the expenditures of a given individual and the expenditures of all others in the individual's reference group, whose expenditures are higher than those of the individual in question. This aggregate expenditure gap is then normalised by the size of the reference group, which is chosen to be the individual's Census Enumeration Area. In the data, 98 percent of the observations are in clusters (reference groups) of 20 observations, the size of the reference group ranging from 14 to 25 observations. In terms of population represented by these reference groups, a CEA represents a few thousand individuals. Gini indices of local inequality are similarly computed at the CEA level.

As a proxy for utility this analysis relies on the responses to an open-ended life satisfaction question "All things considered, I am satisfied with my life now." Possible answers include "strongly disagree", "disagree", neither disagree nor agree", "agree", "strongly agree."[8] Based on these responses, a binary measure of being "above neutral" is constructed, which evaluates to 1 if the respondent agrees or strongly agrees, and to zero otherwise. Above neutral life satisfaction was reported by 44 percent of the overall sample.

[Table 1 here]

In addition, this study employs a number of other attitudinal questions from the survey, such as questions about the respondent's opinion on factors that important for success in life, or on reasons why there is need in society today, or on state's involvement in reducing the gap between the rich

[8] Overall, 2 percent of the sample replied "don't know" or "not applicable" and are excluded from the analysis.

and the poor. Finally, the survey records a number of standard socio-demographic characteristics that are normally found to be important determinants of subjective well-being. Summary statistics the main variables are presented in Table 1. Estimates of the Gini indices of inequality at CEA level for all countries in the sample are presented in Table 2.

[Table 2 here]

4 Empirical analysis of inequality aversion and well-being

The discussion in section 2.2. is operationalised by means of the following empirical specification:

$$h^*_{ijk} = \gamma y_{ijk} + \lambda D(y_{ijk}) + \beta y^{rel}_{ijk} + X'_{ijk}\delta + \eta_k + \varepsilon_{ijk}$$

where h^*_{ijk} is latent satisfaction, y_{ijk} is the per capita consumption of household i from Census Enumeration Area j in country k, $D(y_{ijk})$ is Yitzhaki's measure of relative deprivation, $y^{rel}_{ijk} = y_{ijk} - \mu_{jk}$, and μ_{jk} is the mean income of the reference group. The correspondence between the parameters of the theoretical model in section 2.2. and the coefficients of the empirical specification is as follows: $\lambda = \alpha + \beta$, where β captures, as before, aversion to advantageous inequality. Thus, the joint test of inequality aversion is the test of the null hypothesis $\lambda = 0$, and $\lambda < 0$ (equivalent to $\alpha + \beta < 0$) indicates inequality averse preferences based on this joint test. Moreover, $\beta < 0$ indicates aversion to advantageous inequality, and $\lambda - \beta < 0$ (equivalent to $\alpha < 0$), indicates aversion to disadvantageous inequality.

To account for a number of confounding factors, the FS model is estimated conditional on a set $\mathbf{X}$ of variables that have been previously found to explain variation in life satisfaction. These include a second degree polynomial in age (to account for the well-known U-shaped relationship between age and life satisfaction), sex and education of the respondent, whether the respondent is the head of the household, household size, area of residence (rural / urban / metropolitan), respondent's employment status and religious affiliation. A dummy for whether there were two respondents in the household is also included to account for imperfect knowledge of household expenditures by respondents who are not heads of household.

Regressions also include dummies indicating the nature of respondent's (self-reported) mobility during the 1989-2006 period, whether downward, upward or stable (baseline). These mobility dummies are based on the answers to a ladder question that asks the respondent to place herself today (in 2006), and similarly in 1989, on a "ten-step ladder where on the bottom, the first step, stand

the poorest people and on the highest step, the tenth, stand the richest." The inclusion of these dummies allows also for an inter-temporal reference point, which has been found to be important in the literature on adaptation (Frederick and Loewenstein, 1999; Frey and Stutzer, 2001; Di Tella et al., 2003; Di Tella et al., 2007). Senik (2009), for instance, finds comparisons with own economic situation prior to 1989 to still be an important determinant of subjective well-being 15 years into the transition process in Eastern Europe. Since movements from the 1st step to the 2nd, and from the 5th step to the 6th, for instance, can be perceived as qualitatively different, the specification also controls for the respondent's placement on the current (2006) economic ladder.

To account for differences in subjective well-being across countries, a set of country dummies is also included in the regressions. It is further assumed that $Pr[h = 1|X] = \Lambda(X'\beta)$, such that ε is logistically distributed.[9] Finally, within-reference group correlation of the errors is allowed.

The above model is the baseline FS specification for the empirical test of inequality aversion. Estimates from this model (Table 3), reveal that both for the full sample and for regional subsamples other than South-Eastern Europe [10] respondents exhibit aversion to disadvantageous inequality, controlling for a number of characteristics commonly found to be important determinants of life satisfaction. The coefficient which measures aversion to advantageous inequality is also negative, as suggested by Fehr and Schmidt (1999), but insignificant. The overall test of the hypothesis $\lambda = 0$ rejects the null in three out of four cases, finding considerable support for inequality averse preferences. In practical terms, the estimates of the baseline model imply that a rank-preserving progressive transfer resulting in a 1 unit (USD 1,000/year/per person) increase in relative deprivation, holding own income and mean group income constant, would be associated with a 4 percentage points lower probability of reporting above average life satisfaction. A one standard deviation increase in relative deprivation (USD 620) would be associated with a 2.4 percentage points lower probability of reporting above neutral life satisfaction. For the CIS subsample a one standard deviation increase in relative deprivation would be associated with a 3 percentage points lower probability of reporting above neutral life satisfaction.

[Table 3 here]

The other variables in the model have expected signs. Age and life satisfaction exhibit a U-shaped

[9] Logistic regressions are estimated instead of a customary ordered logit specification due to the fact that the chi-square tests reject the assumption of proportional odds, implicit in the ordered logit specification. Results from the ordered specifications are qualitatively similar.

[10] The group of EU members comprises Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia; the group of non-EU South-Eastern European countries includes Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYR Macedonia, Montenegro, Romania and Serbia; the group of CIS countries is comprised of 11 countries, including all former Soviet Republics with the exception of the Baltic States (included in EU) and Turkmenistan, for which data were not available.

relationship with a minimum at around the age of 50, which is consistent with other studies in the happiness economics literature (Graham 2009). Men report higher satisfaction levels in the overall sample and in the CIS sub-sample, which is consistent with other findings from Transition Economies, although in Western Europe the opposite tends to be the case (Graham 2009). Satisfaction with life increases with the education level of the respondent, and is also higher for those who are employed and for those from larger households.

The estimates also suggest an important inter-temporal reference point - downward mobility during the 1989-2006 period is associated with lower satisfaction with life, holding current position on the income ladder constant. The coefficient on the upward mobility variable is positive, as expected, but not significant in any of the specifications. Even though 15 years elapsed between the collapse of the Soviet Union and the LiTS survey, the pre-transition standard of living still looms large in people's memories (see also Senik 2009). These results are consistent with loss aversion (Kahneman and Tversky, 1979) and with adaptation being more complete in the domain of gains from the reference point relative to the domain of losses (Arkes et al, 2006).

A modified version of the above model is estimated next, where $D(y_{ijk})$ is substituted with G_{jk}, the Gini coefficient of inequality defined at the reference group level. This specification aims to test whether inequality aversion can also be captured by looking at the relationship between an aggregate index of inequality and individual life satisfaction, conditional on the same set of control variables. There are two main reasons for choosing the Gini index in favour of some other aggregate index of inequality as, for instance, Theil. First, the Gini index is most commonly used index to measure inequality, and it is also the index that is generally employed in the studies that estimate a relationship between the individual satisfaction and the level of inequality. More importantly, Gini is the theoretically relevant index of inequality, implied by the FS model. To see this, note that given no within group variation in the Gini index, a regression of individual satisfaction on the Gini index essentially looks at the relationship between mean group satisfaction and the group's index of inequality. Aggregating the FS utility specification to group level gives group satisfaction as a function of mean group income and the group's Gini index of inequality (see section 4.2).

The results are reported in Table 4.[11] The Gini coefficient has no association with life satisfaction at conventional significance levels, which is in line with the earlier results by Senik (2004) and Graham and Felton (2006) who similarly find no relationship between inequality and well-being. As the discussion in section 2.2. suggested, the difference between the results in Tables 3 and 4,

[11] In this and all of the tables that follow the conditioning vector remains the same as in Table 3, but the estimates are omitted to conserve space.

namely the fact that inequality aversion is captured by the FS specification, but not reflected in the relationship between individual life satisfaction and the Gini index of inequality, can be due to the fact that the latter, unlike the FS specification, is not adept at capturing inequality aversion driven by relative status or mobility concerns.

[Table 4 here]

One of the immediate concerns with the results in Table 3 is that we may not be accounting for all unobserved heterogeneity across reference groups, which may bias the estimates. Accounting for all unobserved heterogeneity across reference groups by means of reference group fixed effects is not possible with the FS specification for reasons of exact multicollinearity. However, sources of possible bias are not clear. Yitzhaki's measure of relative deprivation could be higher either because of higher mean expenditures, or due to higher inequality within the group. The effect of differences in mean expenditures across reference groups within countries is captured by the relative expenditures variable, such that the relative deprivation measure is capturing the degree of expenditure inequality, which is the primary interest of this analysis. The estimates could be biased however if, for instance, a particular characteristic were more (less) common within groups with higher inequality, and also negatively (positively) associated with subjective well-being in ways that are not captured by mean expenditure differences across groups or other control variables.

To account for all unobserved heterogeneity across reference groups a conditional fixed effects logit model is estimated (Table 5) in which matching is done within reference groups.[12] This is similar to the analysis of Eibner and Evans (2005), who also estimate from within-reference group variation, although they rely on a linear specification. In this specification λ is identified out of within reference group variation, accounting for all heterogeneity in unobserved reference group characteristics. The test for inequality aversion is the joint test of the null hypothesis $\lambda = 0$. The estimates in Table 5 confirm the presence of inequality aversion in individual preferences, both in the overall sample and in the EU and CIS regional sub-samples. In this specification a one standard deviation increase in relative deprivation is associated with a 3.6 percentage points lower probability of reporting above neutral life satisfaction in the overall sample, and an 5.3 percentage points lower probability in the EU subsample.

[Table 5 here]

[12] Note that the coefficient on the own expenditures variable in Table 5 is the counterpart of the $(\gamma + \beta)$ in Table 4 and not of γ alone.

As a further robustness check, in column (1) of Table 6 the same regression as above is run with relative deprivation defined in terms of minimum income instead of actual household expenditures. Minimum income is reported in response to the question 'Living in the dwelling and doing what you do, what would be the minimum amount of money that this household would need to make ends meet at the end of each month.'[13] The estimates suggest that inequality in perceived necessary minimum income does not have an effect on utility. Upon reflection, this is not surprising. The income that is perceived as being the necessary minimum is likely to already reflect the relative status concerns that may be present. Indeed, as the estimates in column (2) suggest, $\alpha < 0$, such that disadvantageous inequality in expenditures has a positive effect[14] on the amount of money deemed to be the necessary minimum.

[Table 6 here]

4.1 What is driving inequality aversion?

What could be the source of inequality aversion? One possibility is that individuals are intrinsically averse to inequality in outcomes, such that inequality is utility-decreasing even when it can be considered as just from the social justice perspective. Another possibility is that inequality aversion is the outcome of perceptions of unfairness with regard to the processes that determine the distribution of fortunes. With regard to the results of laboratory experiments, the World Development Report 2006 notes that "it is possible to speculate that the aversion to very unequal payoff distributions in the Ultimatum Game arises from the arbitrary and unequal nature of the endowments (or power) implicit in the initial allocation of the roles of Proposer and Responder" (World Bank 2005: 81). Graham and Felton (2006) argue that inequality exhibits a negative impact on happiness in Latin America because it signals persistent unfairness. Alesina, DiTella and MacCulloch (2004) similarly argue that the strong inequality aversion in Europe is due to a lower degree of mobility in the society, whereas Americans believe that poverty can be escaped through hard work. Runciman (1972:22) notes that relative deprivation is brought about by the upsetting of expectations, such as for instance, when stable expectations are disappointed. The transition period can certainly be described as the time when stable expectations of many individuals had been disappointed.

An empirical test of this hypothesis is possible with the LiTS data. Respondents were asked the following question: "In your opinion, what is the main reason why there are some people in need in our country today?", the possible answers being "because they have been unlucky", "because

[13] Minimum income is converted to per capita units.
[14] The effect of advantageous inequality (β) is negative, as expected, albeit not statistically significant.

of laziness and lack of willpower", "because of injustice in our society", "it is an inevitable part of modern life" and "other". Given the widespread complaints of corruption and the illegally acquired wealth during the early transition years, as well as the collapse of the social safety nets, it is perhaps not surprising that more than 40 percent of respondents in the sample reported injustice to be the main source of need in society. At the same time, more than 20 percent of the sample say that need is the result of laziness. The baseline FS specification is re-estimated for these two groups of respondents.

[Table 7 here]

If inequality aversion is indeed brought about by perceptions of unfairness, then it would be expected to be stronger among those who believe that people are stuck in bad outcomes because of injustice. At the same time, the skyrocketing inequality should have less of an effect on those who believe that need is due to laziness, since, as in the American case, their deprivation need not be unfair. The estimates are reported in Table 7. Indeed, inequality aversion is heightened by the perception of unfairness. Respondents who believe that need is caused by laziness do not exhibit inequality averse preferences, unlike respondents who believe that need is caused by injustice.

Respondents were additionally asked about the factors that are important to succeed in life today, and also about factors important for success prior to 1989. Here the focus is on those who reported the main factor for success to be 'effort and hard work' on the one hand, and 'political connections / criminal and corrupt ties' on the other hand. Estimates reported in Table 8 suggest aversion to inequality among those who believe success today to be determined by political connections or criminal ties, but not among those who believe that hard work is the main determinant of success.

[Table 8 here]

When similar regressions are run for attitudes toward success prior to 1989, the results are reversed. Inequality averse preferences are observed among those who believe that prior to 1989 hard work was the main factor of success, but not among respondents who believed that before the transition period started political connections were important. In other words, it seems that those who believed in the importance of hard work in the past associate the inequality in the distribution today as not being the result of hard work, but rather of corruption, which is why it has a negative effect on utility. Those who think that political / criminal connections were important even before 1989 were perhaps less disturbed by the rampant corruption during the transition years. Why should there be a difference between the results in columns (2) and (4) if inequality is corruption-driven?

Recall Runciman's argument that relative deprivation is heightened when expectations are being disappointed. It is likely that for the subgroup in column (4) the expectations were not disappointed, if they already saw connections as the main key to success even before 1989.

In addition to institutional factors, it may also be the case that aversion to inequality is driven by the personal fortunes throughout the turbulent transition years. As suggested by estimates in Table 3, lower status on the socio-economic ladder today relative to 1989 is negatively associated with reported life satisfaction. One could hypothesize, as do Graham and Felton (2006), that attitudes toward inequality will be coloured by one's own mobility trajectory during the transition period. Aversion to inequality may be higher, in particular, among those who moved down the socio-economic ladder during the 1989-2006 period, according to their own perceptions, and, correspondingly, lower among the upwardly mobile group. Estimates in Table 9 do not necessarily bear out this hypothesis, however. The FS specification is re-estimated separately among those who reported being on a lower ladder step in 2006 than in 1989 (column 1), and those who either stayed in place or moved up the socio-economic ladder (column 2). The estimates for both of these groups are similar in magnitude and in both cases $\alpha < 0$, and albeit the joint test of no inequality aversion is rejected only the case of the downward mobile group, the magnitudes of the standard errors suggest that the estimates for the upwardly mobile sample are less precisely estimated.

[Table 9 here]

Future mobility prospects can also influence one's preferences for the degree of inequality in society. Benabou and Ok (2001) propose a model in which it can be rational for poor individuals today to oppose redistribution because they expect to move up the economic ladder in the future (known as the *prospect of upward mobility hypothesis*). While respondents' mobility aspirations are are not available in the data, it is possible to hypothesise that younger cohorts may be more optimistic about future economic mobility, and hence less averse to inequality, because it may be easier for them to develop or adapt their skill set to match the changing requirements of the labour market. To test this empirically I split the sample into three groups based on age tertiles, which corresponds to the following groups: respondents aged 37 or under, respondents in the 38-55 age group, and respondents aged 56 or higher) and re-estimate the FS model for each of these age groups. This split is abritrary, but it ensures that the first group was 21 or younger in 1989, such that they completed their tertiary education and entered the labour market after the start of transition. The results are consistent with the above reasoning - inequality averse preferences are not observed for the under 35 age group, whereas in the other two groups the joint test of no inequality aversion

rejects the null of $\lambda = 0$. These results are also consistent with the findings of Bellemare et al. (2008).

[Table 10 here]

4.2 Implications for social welfare

Consider an additive social welfare function of the form $W(y) = \int_0^{y^*} u(z)dF(z)$. Aggregating the the level of reference groups, we obtain:

$$W_j(y) = \mu_j(1 - \theta G_j)$$

where μ_j denotes mean expenditures in cluster j, G_j is the group's Gini index of inequality, and $\theta = -(\alpha + \beta)$. Note that in the case of inequality averse preferences $\theta > 0$, as confirmed by the estimates in section 4.1, such that higher within-group inequality lowers social welfare. Note also that $W(y)$ resembles Atkinson's formulation $W = \mu(1 - I)$, where μ is mean group income and I is the group's measure of inequality. However, it is important to note that Atkinson's social welfare function is normative in character and has inequality aversion built into it, such that it allows for reductions in mean income for purposes of greater equality. The social welfare function adopted here, on the other hand, is utilitarian in nature, and is not *per se* concerned with inequality. The fact that the social welfare function allows for tradeoffs between the size of the pie and the degree of inequality in its distribution stems from inequality aversion in individual preferences. It is clear from this formulation that a redistribution of income via a rank-preserving Pigou-Dalton transfer that decreases inequality will lead to an increase in social welfare, whereas a regressive transfer that increases inequality would reduce social welfare.

This result is confirmed in Table 11, which presents estimates of PSU-level OLS regressions of mean PSU life satisfaction on mean PSU expenditures, mean PSU Gini index of inequality, as well as mean values of control variables collapsed to the level of PSUs. Group level life satisfaction is positively associated with the average group expenditures and negatively associated with the group Gini (column 1). The negative association between average life satisfaction and inequality is maintained if country dummies are added to the specification, such that the estimates draw only on within-country variation (column 2), and when mean values of other covariates other than the mobility and current economic rank are accounted for (column 3). The relationship between inequality and life satisfaction becomes insignificant when we control for the 1989-2006 mobility

experience (column 4). This latter result is not surprising once it is noted that movements up and down the socio-economic ladder since 1989 (and in particular wage losses as the result of the post-1989 economic contraction) are likely among the key determinants of the level of inequality today.

[Table 11 here]

4.3 Inequality aversion and support for redistribution

Since inequality aversion is inherent in individual preferences, and since these preferences imply that redistributive policies have a positive effect on social welfare, it should be the case that inequality averse individuals should favour redistributive policies. Indeed, Alesina et al. (2004) argue that Europeans, whom they find to be averse to inequality, should favour redistributive policies since they believe that the poor are stuck in poverty and are thus worthy of help. It is possible to test for this using LiTS data, since respondents are asked whether the state should be involved in reducing the gap between the rich and the poor, possible answers being "[the state should be] not involved", "moderately involved" and "strongly involved". From these answers a binary variable is created which evaluates to 1 if the response was "strongly involved", and zero otherwise. The regressions with this measure as the dependent variable are run for the same subgroups as in Tables 7 and 8 (columns 1 and 2). We would expect inequality aversion, which was found not to be intrinsic but rather linked to a sense of fairness, to be associated with a favourable attitude toward the redistribution of income. Likewise, if need is perceived as an outcome of laziness, or success is perceived to be the product of hard work, inequality need not lead to concerns for the needy and calls for a stronger involvement of the state in redistributing income.

The estimates in Table 12 confirm this intuition. Higher inequality among those who view need in society today as the product of injustice or success in society as the product of political or criminal connections has a positive and statistically significant effect on the desire for strong state involvement in bridging the gap between the rich and the poor. Among those who report need as the product of laziness, and success - the product of hard work, however, inequality has no discernible effect on preferences for redistribution.

[Table 12 here]

5 Conclusions

Since 1989 the countries of Eastern Europe have undergone major transformations along a number of political, economic and social dimensions. One notable outcome of the transition period has been a considerable increase in economic inequality in the region. With the help of recent survey data for 27 transition economies, the aim of this paper has been to investigate the degree of tolerance for inequality in this region. This is a first account of the relationship between inequality and well-being in Eastern Europe using consistent survey data for a large number of transition economies. The paper also contributes to the related literature that looks at whether concerns with equity commonly noted in laboratory experiments can also be observed in the general population. Whether or not individuals are averse to inequality is likely to be mirrored in preferences over redistributive polices and individual well-being.

A test of inequality aversion borrowed from Fehr and Schmidt (1999) finds considerable support for aversion to inequality in individual preferences, and this result holds across a number of specifications, and also across regional subsets of countries. The benefit of this model is that it can detect aversion to inequality that is driven by status and mobility considerations, a setting where aggregate inequality measures provide little help. Indeed, this study found that the Gini index was unable to capture this negative effect of inequality on well-being.

Building on the work by Roemer (2000) and earlier philosophical studies (Sen 1980; Dworkin 1981; Arneson 1989; Cohen 1989), a number of recent papers distinguish between overall inequality and inequality of opportunity. (Bourguignon et al. 2003; Roemer et al. 2003; Ooghe et al. 2007; Checchi and Peragine 2009; Cogneau and Mesple-Somps 2008; Ferreira and Gignoux 2008; Ferreira et al. 2008, 2010; Lefranc et al. 2008, 2009). These studies stress that it is inequality of opportunity that is morally objectionable, as opposed to inequalities generated by differences in effort. While I do not formalise a concept of inequality of opportunity in this study, the evidence this paper presents is suggestive of inequality of opportunity driving attitudes toward overall economic inequality in transition economies. Aversion to inequality is found not to be intrinsic, but rather tied to a concern with fairness in the institutions underlying the distribution of fortunes in society.

Inequality averse preferences imply a negative relationship between inequality and social welfare, even when the underlying social welfare function is utilitarian in character and is not intrinsically concerned with inequality. This suggests that inequality aversion should be associated with demands for redistributive policies. Consistent with this intuition, the LiTS data confirm the association between inequality and demands for strong government involvement in bridging the gap between

the rich and the poor, but only when inequality is perceived to be unfair. Exploring the extent and drivers of inequality of opportunity in the region, the factors influencing economic mobility, and how they relate to - and are affected by - social policy thus appear to be fruitful avenues for future research.

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Table 1: Summary statistics

Variables	Mean	SD
Life satisfaction	0.440	0.496
Age	48.514	17.574
Male	0.411	0.492
Education		
Compulsory or none	0.230	0.421
Secondary education	0.269	0.444
Professional / vocational	0.311	0.463
University education	0.191	0.393
HH size	3.188	1.826
Area of residence		
Urban	0.363	0.481
Rural	0.432	0.495
Metropolitan	0.205	0.404
Employed	0.469	0.499
Head of HH	0.554	0.497
Two respondents	0.384	0.486
Religion		
Agnostic / atheist / none	0.091	0.288
Christian	0.686	0.464
Muslim	0.205	0.404
Other	0.017	0.131
Economic rank (ladder) in 2006	4.267	1.754
Economic mobility 1989-2006		
Downward	0.595	0.491
Stable	0.204	0.403
Upward	0.201	0.401
Expenditures per capita (000)	1.861	1.840
Mean reference group expenditures (000)	1.881	1.231
Relative deprivation (000)	0.601	0.636
Minimum income per capita (000)	2.995	2.920
Mean reference group min income (000)	3.007	2.082
Relative deprivation in min income (000)	0.871	1.015
Gini index of inequality (CEA level)	0.303	0.076
Preference for government involvement in redistribution	0.692	0.461

Notes:Estimates based on the full sample of 27 countries.

Table 2: CEA level Gini index of inequality by country

Country	Mean	SD
Albania	0.287	0.061
Armenia	0.350	0.080
Azerbaijan	0.339	0.071
Belarus	0.295	0.074
Bosnia and Herzegovina	0.301	0.082
Bulgaria	0.291	0.074
Croatia	0.305	0.067
Czech Republic	0.246	0.060
Estonia	0.299	0.061
Macedonia, FYR	0.296	0.092
Georgia	0.348	0.066
Hungary	0.277	0.054
Kazakhstan	0.276	0.061
Kyrgyzstan	0.308	0.085
Latvia	0.335	0.074
Lithuania	0.313	0.068
Moldova	0.339	0.081
Montenegro	0.286	0.071
Poland	0.281	0.057
Romania	0.326	0.077
Russia	0.293	0.060
Serbia	0.314	0.069
Slovakia	0.268	0.068
Slovenia	0.267	0.056
Tajikistan	0.260	0.080
Ukraine	0.351	0.096
Uzbekistan	0.300	0.066

Notes: Estimates are unweighted averages of CEA level statistics.

Table 3: Baseline FS model of inequality aversion, by region

	(1)	(2)	(3)	(4)
Own expenditures (γ)	0.021**	0.018	0.030*	0.027
	(0.008)	(0.010)	(0.015)	(0.019)
Relative expenditures (β)	-0.015	-0.022	-0.002	-0.029
	(0.009)	(0.013)	(0.018)	(0.022)
Yitzhaki's RD (λ)	-0.038***	-0.051**	-0.008	-0.069*
	(0.012)	(0.016)	(0.022)	(0.027)
Age	-0.010***	-0.010***	-0.010***	-0.008***
	(0.001)	(0.002)	(0.002)	(0.002)
Age squared	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.014*	0.007	0.008	0.022*
	(0.007)	(0.012)	(0.012)	(0.011)
Education (omitted - secondary)				
Compulsory or none	-0.020*	-0.021	-0.044**	0.007
	(0.009)	(0.017)	(0.017)	(0.016)
Vocational	0.005	0.006	-0.007	0.007
	(0.009)	(0.015)	(0.018)	(0.013)
University	0.052***	0.077***	0.041*	0.034*
	(0.009)	(0.018)	(0.018)	(0.013)
HH size	0.012***	0.014**	0.019***	0.009**
	(0.002)	(0.005)	(0.004)	(0.003)
Employed	0.027***	0.028	0.025	0.026*
	(0.008)	(0.015)	(0.014)	(0.012)
Head of HH	-0.014	-0.028	-0.010	0.001
	(0.010)	(0.016)	(0.018)	(0.018)
Two respondents	0.018	0.023	0.014	0.023
	(0.010)	(0.017)	(0.017)	(0.017)
Current income rank	0.060***	0.063***	0.058***	0.059***
	(0.003)	(0.005)	(0.004)	(0.004)
Mobility (omitted - stable)				
Downward mobility 1989-2006	-0.118***	-0.134***	-0.115***	-0.107***
	(0.010)	(0.015)	(0.017)	(0.019)
Upward mobility 1989-2006	0.021	0.034	0.002	0.026
	(0.012)	(0.018)	(0.025)	(0.022)
Religion (omitted - atheist/agnostic)				
Christian	0.003	-0.024	-0.011	0.063**
	(0.012)	(0.017)	(0.031)	(0.023)
Muslim	0.026	-0.121	0.017	0.084**
	(0.020)	(0.096)	(0.037)	(0.030)
Other	-0.033	-0.047	0.038	-0.048
	(0.024)	(0.032)	(0.068)	(0.052)
Area of residence (omitted - urban)				
Rural	-0.008	0.023	-0.019	-0.024
	(0.011)	(0.018)	(0.020)	(0.017)
Metropolitan	-0.011	-0.008	-0.048	0.015
	(0.013)	(0.021)	(0.024)	(0.022)
Pseudo R-squared	0.175	0.149	0.143	0.191
Obs	23783	7117	7306	9360
α	-0.023	-0.029	-0.006	-0.040
Prob>chi2	0.002	0.004	0.729	0.008

Notes: Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent *agrees* or *strongly agrees* with *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Column (1) - full sample; (2) - EU; (3) - SEB; (4) - CIS. Country dummies included but not reported. The structural parameter α is calculated based on regression estimates, and the associated probability is for the test of the hypothesis λ - $\beta = 0$. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 4: Model with the Gini measure of inequality, by region

	(1)	(2)	(3)	(4)
Own expenditures	0.007	0.001	0.027*	-0.002
	(0.006)	(0.008)	(0.014)	(0.014)
Relative expenditures	0.009	0.008	0.002	0.014
	(0.006)	(0.008)	(0.013)	(0.013)
Gini	0.044	-0.119	0.176	0.039
	(0.069)	(0.127)	(0.113)	(0.113)
Pseudo R-squared	0.175	0.148	0.143	0.190
Obs	23783	7117	7306	9360

Notes: Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent *agrees* or *strongly agrees* with *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Column (1) - full sample; (2) - EU; (3) - SEB; (4) - CIS. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 5: Specification with reference group fixed effects

	(1)	(2)	(3)	(4)
Expenditures ($\gamma + \beta$)	0.001	-0.013	0.020*	-0.002
	(0.005)	(0.007)	(0.008)	(0.007)
RD (λ)	-0.057***	-0.069***	-0.049	-0.058*
	(0.013)	(0.018)	(0.025)	(0.028)
Pseudo R-squared	0.122	0.126	0.127	0.121
Obs	22815	7023	6962	8830

Notes: Conditional fixed effects logistic regressions. Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent *agrees* or *strongly agrees* with *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Column (1) - full sample; (2) - EU; (3) - SEB; (4) - CIS. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 6: Further robustness checks

	(1)	(2)
Minimum income (γ)	-0.004	
	(0.005)	
Relative min income (β)	0.007	
	(0.006)	
RD (minimum income) (λ)	0.002	
	(0.007)	
Own expenditures (γ)		0.936***
		(0.137)
Relative expenditures (β)		-0.268
		(0.163)
Yitzhaki's RD (λ)		-0.137
		(0.150)
R-squared		0.556
Pseudo R-squared	0.173	
Obs	23730	24199
α	-0.005	0.132
Prob>F	0.295	0.043

Notes: Average marginal effects in (1) OLS estimates in (2). Robust standard errors, clustered at reference group level in parentheses. Dependent variable in column (1) equals 1 if respondent *agrees* or *strongly agrees* with *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Dependent variable in column (2) is the reported minimum amount of money per capita needed to make ends meet. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 7: Injustice vs laziness

	(1)	(2)
Own expenditures (γ)	0.027	0.025*
	(0.014)	(0.011)
Relative expenditures (β)	-0.017	-0.020
	(0.019)	(0.013)
Yitzhaki's RD (λ)	-0.013	-0.047**
	(0.025)	(0.016)
Pseudo R-squared	0.159	0.151
Obs	5195	10788
α	0.004	-0.027
Prob>chi2	0.775	0.006

Notes: Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent *agrees* or *strongly agrees* with *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Column (1) - sample restricted to respondents who believe that need is the result of *laziness and lack of willpower*; column (2) - sample consists of respodents who believe need in society to be the result of *injustice*. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 8: Hard work vs political and criminal connections

	(1)	(2)	(3)	(4)
Own expenditures (γ)	0.024	0.014	0.024*	0.005
	(0.013)	(0.011)	(0.010)	(0.013)
Relative expenditures (β)	-0.010	-0.009	-0.023	0.022
	(0.016)	(0.014)	(0.012)	(0.018)
Yitzhaki's RD (λ)	-0.026	-0.046*	-0.045**	0.021
	(0.019)	(0.018)	(0.015)	(0.025)
Pseudo R-squared	0.173	0.173	0.178	0.174
Obs	9070	7288	12845	4839
α	-0.016	-0.036	-0.022	-0.001
Prob>chi2	0.193	0.001	0.022	0.907

Notes: Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent *agrees* or *strongly agrees* with *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Column (1) - Sample restricted to respondents who believe that *effort and hard work are the most important factor to succeed in life now*, (2) - respondents who believe *political or criminal ties to be the most important factor to succeed in life now*, (3) - respondents who state that *effort and hard work were the most important factor to succeed in 1989*, (4) - respodents who believe *political, criminal ties* to have been the main determinant of success in 1989 Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 9: Winners and losers of the transition process

	(1)	(2)
Own expenditures (γ)	0.021*	0.026
	(0.009)	(0.015)
Relative expenditures (β)	-0.014	-0.020
	(0.012)	(0.021)
Yitzhaki's RD (λ)	-0.038**	-0.048
	(0.014)	(0.026)
Pseudo R-squared	0.147	0.112
Obs	14147	4786
α	-0.024	-0.029
Prob>chi2	0.013	0.045

Notes: Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent *agrees* or *strongly agrees* in response to the question *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Column (1) - downwardly mobile sample; (2) - upwardly mobile or stable sample. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 10: Inequality aversion among young and old respodents

	(1)	(2)	(3)
Own expenditures (γ)	0.011	0.021*	0.029*
	(0.013)	(0.010)	(0.012)
Relative expenditures (β)	0.009	-0.025	-0.025
	(0.016)	(0.013)	(0.015)
Yitzhaki's RD (λ)	-0.007	-0.054**	-0.042*
	(0.020)	(0.017)	(0.017)
Pseudo R-squared	0.160	0.175	0.160
Obs	8032	9314	8656
α	-0.016	-0.029	-0.017
Prob>chi2	0.198	0.005	0.117

Notes: Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent *agrees* or *strongly agrees* in response to the question *All things considered, I am satisfied with my life now*, and zero if the respondent *strongly disagrees, disagrees* or *neither disagrees nor agrees*. Column (1) - respondents ages 37 or younger; (2) - age group 38-55; (3) - 56+ age group. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 11: Inequality and well-being across groups

	(1)	(2)	(3)	(4)
Mean group expenditures	0.108***	0.113***	0.079***	0.037*
	(0.013)	(0.017)	(0.020)	(0.018)
Group Gini	-1.362***	-0.594**	-0.380*	-0.217
	(0.206)	(0.182)	(0.184)	(0.160)
Country dummies	N	Y	Y	Y
Socio-demographic controls	N	N	Y	Y
Mobility controls	N	N	N	Y
R-squared	0.078	0.457	0.483	0.570
Obs	1350	1350	1350	1349

Notes: OLS estimates from CEA-level regressions. Robust standard errors in parentheses. Dependent variable is mean reference group life satisfaction. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table 12: Institutions and attitudes toward redistribution

	(1)	(2)	(3)	(4)
Own expenditures (γ)	-0.020	-0.031**	0.011	-0.051***
	(0.020)	(0.011)	(0.015)	(0.013)
Relative expenditures (β)	0.014	0.040**	-0.017	0.056***
	(0.023)	(0.014)	(0.018)	(0.016)
Yitzhaki's RD (λ)	-0.001	0.033*	-0.009	0.041*
	(0.027)	(0.017)	(0.021)	(0.018)
Pseudo R-squared	0.075	0.078	0.084	0.093
Obs	5303	10969	9272	7405
α	-0.015	-0.007	0.008	-0.015
Prob>chi2	0.439	0.468	0.605	0.168

Notes: Average marginal effects. Robust standard errors, clustered at reference group level in parentheses. Dependent variable equals 1 if respondent states *strongly involved* in response to the question *Do you think the state should be involved in reducing the gap between the rich and the poor?* Column (1) - respondents who believe that need is the result of *laziness and lack of willpower*; column (2) - respodents who believe need in society to be the result of *injustice*. Column (3) - respondents who believe that success is the result of *hard work*; column (4) - respondents who believe that success is due to *political / criminal connections*. Significance: * p<0.05, ** p<0.01, *** p<0.001.