Shaleva *IZA Journal of Labor & Development* (2015) 4:15
DOI 10.1186/s40175-015-0037-3

IZA Journal of Labor & Development
a SpringerOpen Journal

ORIGINAL ARTICLE Open Access

Uncovering the impact of intergenerational income mobility on interpersonal trust

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Abstract

Alluding to theories about relative economic status and behavior, this paper studies if relative income mobility, or the intergenerational change in income positions, affects interpersonal trust. Empirically, the question is brought down to an application with US General Social Survey data. For the identification of a causal relationship, I use a structural approach and estimate a recursive bivariate probit that controls for selection on unobservables. Results suggest that trust increases if children have achieved an upward income movement away from their parents' income position, and it decreases with the experience of downward income mobility. Policy implications are also discussed.

JEL codes: H8; O4; Z00

Keywords: Interpersonal trust; Intergenerational income mobility; Recursive bivariate probit; Selection on unobservables

1 Introduction

Over the last few decades, trust within societies, known also as interpersonal or social trust, has turned out worthy of increasing attention from both public policy makers and social scientists. Arrow (1974) defines trust as a social lubricant to cooperation and economic exchange, and Putnam (1993) considers it a fundamental building block of social capital. More specifically, Stiglitz (2000) and Millo and Pasini (2010) suggest that interpersonal trust alleviates moral hazard and incentive problems. Empirical evidence confirms the economic theories by finding associations of trust, for example, with investment and transcation costs (Zak and Knack 2002), large organizations' performance (La Porta et al. 1997), and ultimately—by revealing a causal relationship of trust with growth (Algan and Cahuc 2010).

Motivated by the above findings, this paper falls into a branch of the economics literature interested in the factors that influence trust. Regarding determinants at the individual level, Alesina and La Ferrara (2002) find that trust is lower for blacks, women, people with traumatic experience, and those who live in societies with ethnic, race and economic heterogeneity. Zak and Knack (2002) study trust as an outcome of formal/informal institutions, while Aghion et al. (2010) find a negative effect of market regulation on trust. Income inequality is another factor for which previous studies have consistently uncovered an effect on trust. The higher the gap between rich and poor in a society, the

lower the level of interpersonal trust on both cross-country (Zak and Knack 2001) and cross-community dimensions (Alesina and La Ferrara 2002).

Related literature has implied the interconnection between income mobility and sense of fairness by discussing mobility's relationship with inequality. Solon (2002) suggests that intergenerational income mobility could involve intergenerational transmission of inequality. In the majority of country-level studies, high income mobility is complemented with low cross-section inequality (Gottschalk and Smeeding 1997; Freeman and Katz 1995; and Aaberge et al. 2002 – cited in Solon 2002). Gottschalk (1997) argues that the trend toward greater inequality is to be reduced only if mobility increases. Under a standard approach that assumes all inequalities as unfair, translating the stylized facts on mobility and inequality to mobility and fairness bolsters the speculation that more fairness could be attained also with higher mobility. That said, social trust could be affected by changes in income mobility, and not only by changes in income inequality.

Under a structural approach, controlling for selection on unobservables, this paper aims to uncover a causal relationship between relative intergenerational income mobility and present-day interpersonal trust. The intuition behind is that through changing perceptions of fairness about others and the system, income mobility would affect interpersonal trust. This underlying hypothesis has previously been evidenced in the work of Fischer and Torgler (2006), drawing attention to "envy," a concept that differently from perceptions of fairness has a negative connotation, and showing that people's positional concerns about their relative income correlate negatively with their generalized trust. The authors relate the focus of their study to early origins of economics in moral philosophy– for example, the phenomenon of relative wants is central to human behavior in Adam Smith (1759/1976), and similarly, humans measure their wants and pleasures in relation to society in Marx (1849), while in Marshall (1961) the emphasis is on the relevance of human distinction.[1] Despite the importance of the question for studying behavior and attitudes, Fischer and Torgler (2006) point to the scant empirical evidence on it.

Except for adding new empirical evidence to the niche and confirming with causal results Fischer and Torgler's (2006) correlation effects on the impact of relative income position on interpersonal trust, more practically, this paper also contributes to the policy debate. Policies aimed at increasing equality of opportunities, creating education opportunities for disadvantaged children and thus increasing upward intergenerational income mobility could be an alternative to income redistribution. The latter could be seen weak in preventing the underpriveleged from remaining so in the long run as they fight against inequality upfronted ex-post, i.e., by taking away from the wealthy to give to the needy.[2] Based on the results, I can conclude whether the policy option of increasing income mobility would be beneficial for trust.

The availability of US General Social Survey (GSS) data which reports respondents' income, their family income at age 16 along with their current degree of interpersonal trust makes it feasible to identify how trust is affected by the intergenerational change in income position experienced by GSS respondents. For that purpose I construct a simple measure of relative income mobility that equals the difference in income positions achieved by the son/daughter away from their parents' income positions.[3]

The remainder of the paper is organized as follows. Section 2 describes the data, Section 3 presents the econometric specification and the approach for identification.

Section 4 analyzes the results. Section 5 discusses briefly the policy considerations and Section 6 concludes.

2 Data

The US GSS is a unique and valuable data source tracking social behavior and attitudes of Americans since the 1970s.[4] It is a rich dataset containing information on demographic and socio-economic variables, plus records on special topics of interest. In this paper I use data from the GSS panels 2006, 2008 and 2010, which have the question on "family income at age 16" along with questions on interpersonal trust, current income and the necessary control variables for a *TRUST* regression analysis. The sample includes 1,205 married respondents (See Appendix: Table 4).

Trust is conventionally measured by recording respondents' answers to the question "Generally speaking would you say that most people can be trusted/you can't be too careful in dealing with people?". The scale includes: 0 if "cannot trust most people", 1 if the answer is "depends" and 2 if "can trust most people".

Past family income is given by respondents' answer to the question: "Thinking about the time when you were 16 years old, compared with American families in general then, would you say your family income was – "far below average", "below average", "average" , "above average", or "far above average" (See Appendix: Table 5). Current respondent income is an inflation adjusted personal income equal to total earnings from all sources in the last year before taxes or other deductions. The variable is within a range of 25 income brackets (See Appendix: Table 6).

I reduce these 25 income positions for current respondent's income by aggregating them to only 5 categories similar to parents' income: "far below average", "below average", "average", "above average", and "far above average." For two definitions of these five categories, the modification follows US Census (2010) categorical division for personal income: first, closely matching the income brackets of the US Census division–constructing $Rincome^1$ and, secondly, modifying the categories "far below average", "below average" and "average" mainly by expanding the percentage for the category "average" to mirror the corresponging bigger share also for parents'/past family income with the resulting variable $Rincome^2$. For the third definition of current income, I match the category distribution of past family income by creating similar in percentage share categories for respondent's income–thus, constructing $Rincome^3$ (See Appendix: Table 7). With each of these simplified measures for current respondent's income, I obtain the corresponding indices for income mobility that equal the difference of present individual income position and "family income position at age 16" (See Appendix: Table 8). $IMindx^{\mathrm{i}}$ for i=1,2 and 3 captures how incomes are correlated across periods: $IMindx^{\mathrm{i}} = 0$ implies intergeneralational income correlation $\simeq 1$ (i.e., persistence of income), $IMindx^{\mathrm{i}} > 0$ & $IMindx^{\mathrm{i}} < 0$ imply correlation < 1, whereas $IMindx^{\mathrm{i}} \gg 0$ and $IMindx^{\mathrm{i}} \ll 0$ imply correlation $\simeq 0$ (i.e., substantial intergenerational income change). $IMindx^{\mathrm{i}}$ is an intermediate variable which I use as a basis for the construction of binary dummies for income mobility but do not include in the regression analysis.

3 Econometric specification

3.1 Recursive bivariate probit model: selection on unobservables

The empirical challenge for identifying a causal effect of income mobility on trust is to

deal with the endogeneity of income mobility potentially stemming from selection on unobservables. That is, unobservables, such as perceptions of the system's fairness and the subsequent motivation or optimistic/pessimistic attitudes, could determine the chance to achieve a change in parents' income position but could also affect interpersonal trust.

I adopt a structural approach under which the outcome equation for *TRUST* includes intergenerational income mobility as an endogenous binary regressor.[5] Blundell and Smith (1993) describe type I and type II specifications of the bivariate probit model. Since I want to identify the impact of having achieved income mobility on trust rather than the impact of the propensity to achieve income mobility, the type II specification is the appropriate one. The coherency conditions for the type II model are fulfilled only when the model is specified as a recursive system. With the retrospective nature of this study–the outcome is contemporary trust and the explanatory variable, income mobility, has been realized prior to reporting trust perceptions–a recursive system highlights that what is under scrutiny is the causal direction from mobility to trust, and not vice versa. In that way, it is clear that the endogeneity of intergenerational income mobility stems from unobservable heterogeneity bias rather than from a direct effect of trust on the chance to achieve income mobility.

$$TRUST = x_{2i}^{'}\beta_2 + \mu IMI + \varepsilon_{2i} \tag{1}$$

$$IMI = x_{1i}^{'}\beta_1 + \varepsilon_{1i} \tag{2}$$

Selection effects are modelled with a common factor specification of the error terms:

$$\varepsilon_{2i} = \rho\nu_i + u_{2i} \tag{3}$$

$$\varepsilon_{1i} = \rho\nu_i + u_{1i} \tag{4}$$

The error terms are distributed as bivariate standard normal $[\varepsilon_{1i}, \varepsilon_{2i}] \sim \Phi_2(0, 0, \rho)$, where the first two arguments of Φ_2 are the means of ε_{1i} and ε_{2i}, ρ is the correlation between ε_{1i} and ε_{2i}, and ν_i represents unobserved heterogeneity. *IMI* is an endogenous explanatory variable if the correlation between ε_{1i} and ε_{2i} is different from zero, i.e., *IMI* is endogenous if $\rho \neq 0$.

As Jones (2005) explains, the sufficient condition for identification in this recursive system is variation in the set of exogenous regressors since identification occurs by functional form. Although exclusion restrictions are not needed, it is common practice to impose them for improving identification.

I estimate two versions of the model just presented by changing only the definition of the binary dummy for income mobility. First, *IMI* compares any type of income mobility, captured by $IMI = 1$ if $IMindx \neq 0$, with the absence of income change over generations, i.e., $IMI = 0$ based on $IMindx = 0$. Second, rather than generally representing income change with *IMI*, I define two cases for upward and downward income mobility. For upward mobility $IMI^U = 1$ if $IMindx > 0$, and $IMI^U = 0$ for persistence of intergenerational income positions, i.e., $IMindx = 0$. Reversely, for downward mobility $IMI^D = 1$ if $IMindx < 0$, and $IMI^D = 0$ when $IMindx = 0$ for lack of mobility. The binary outcome variable *TRUST* is the same across the two model versions: $TRUST = 1$ if $TRUST > 0$,

i.e., if "can trust most people," and $TRUST = 0$ if the answer is "cannot trust" or "depends." The explanatory variables $x_{1i}^{'}$ and $x_{2i}^{'}$ satisfy the condition $x_{1i}^{'} = (x_{2i}^{'}, z_{1i}) \perp (\varepsilon_{1i}, \varepsilon_{2i})$.

3.2 Exclusion Restrictions

To avoid relying too heavily on the assumption of bivariate normality for identification by functional form, I incorporate into the analysis a key identifying variable z_{1i} to fulfill the exclusion restrictions. But even so, the recursive system is a joint model for trust and income mobility, and not a standard two-step IV approach. The coherency or the logical consistency of the econometric model remains the main pre-requisite for identification.

Since it is necessary that z_{1i} is correlated with the binary dummies for mobility IMI, IMI^{U} and IMI^{D}, and is also independent from ε_{2i}, I use for it a variable that measures the difference between respondent's spouse occupation prestige score and the occupation prestige score of respondent's mother (Diffspousemother). For example, according to a 1989 GSS study of occupational prestige classification (Davis et al. 1991), physicians gain the maximum prestige score while miscellanous food preparation occupations rank the lowest (See Appendix: Table 11). Predicting income with occupation prestige scores is a working approach, as demonstrated by several studies (e.g, Ermisch et al. 2006; Feigenbaum 2014; and Mazumder and Acosta 2015). Occupation prestige scores here would also be proxies for income, so their difference would proxy intergenerational income change. Correlations of the components of Diffspousemother with income mobility provide preliminary statistical justification for using Diffspousemother as a key identifying variable (See Appendix: Table 10). In what follows, I discuss how Diffspousemother would satisfy the exclusion restrictions.

A growing body of research suggests purposeful positive assortative mating in the marriage market. For example, Chadwick and Solon (2002) find evidence for matching with respect to earnings, Chiappori et al. (2009) show that for 50% of the married couples in their sample the husband and wife have the same level of schooling, and similarly Ermisch et al. (2006) evidence assortative mating along human capital. Simple correlation analysis (See Appendix: Table 9) implies the possible assortative mating characterizing married respondents in the GSS sample: 46.6% is the correlation between the respondent's and the spouse's highest degrees and 54.7% between the respondent's and the spouse's years of schooling. Likewise, spouse's occupation prestige score is moderately correlated with respondent's occupation prestige score (30.6%), and mother's occupation prestige score correlates with father's occupation prestige score (38.4%). That said, spouse's occupation prestige score should make a good predictor of respondent's current income position, while mother's occupation prestige score should proxy father's income position and, indirectly, the family's income situation of the respondent at age 16. With valid components, the variable Diffspousemother becomes a credible predictor of intergenerational income mobility, in line with the first exclusion restriction.

A challenge in the analysis is the possible dependence of Diffspousemother from the unobservables included in ε_{2i}, i.e., explanatory factors for $TRUST$. It is not straightforward to conclude the contrary, so I discuss the main arguments of controversy. Even though assigned by an external actor, such as a government agency, occupation prestige scores could reflect perceptions of both the professionals having the scores assigned and society as an observer of prestige and status. For example, Paxton (2007) finds a positive effect of occupation prestige score on the predicted probability of generalized

(interpersonal) trust. Allusive of that finding is Ermisch and Gambetta's (2011) result showing that sons' trustworthiness, even though not exactly trust, is affected positively by fathers' occupation prestige score if high. The same question, but studied vice versa, is also found in Piff et al. (2010), with the hypothesis that "lower class" people (with lower occupation prestige score) are more concerned with the needs of others than "upper class" people, and so will act in a more pro-social manner to improve others' welfare.

Not excluding the possibility that occupation prestige scores reflect individual differences in trust, I elaborate on each of the components of the variable Diffspousemother by explaining the related caveats for dependence with the unobservables shaping trust. Since I use mother's occupation prestige score to proxy parents' income, the first concern is whether transmission of trust-related unobservables from mother to child takes place. I should acknowledge that the evidence on this is controversial–for example, using data from a German Socio-Economic Panel Study, Dohmen et al. (2012) find that trust attitudes are transferred from parents to children. In contrast, relying on a sample of 377 twins, Van Lange et al. (2014) reveal that genetic influences are almost absent from trust and more modest than that of various expressions of abilities and personality traits. The authors' findings challenge the law in behavior genetics according to which all human behavioral traits are quite heritable. They emphasize that what shapes "trust in others" is the social interaction experiences outside of the immediate family.

The concern related with the second component of Diffspousemother, spouse's occupation prestige score, is about possible assortative mating along the dimension of trust. Indeed, this may happen, as already demonstrated by Dohmen et al. (2012). Nevertheless, Luo and Klohnen (2005) show positive similarities of married individuals for attitudes other than trust (e.g, religiosity, political attitudes) with dissimilarities for personal traits such as extraversion, openness and avoidance. It appears that the personal traits just mentioned would be related to "trust in others," and thus depending on the definition of trust, Dohmen et al.'s (2012) findings could be easily complemented with opposing results. Moreover, going back to the findings of Van Lange et al. (2014), what matters for trust is the direct personal experience in social interactions, and even the shared spouses' environment is not expected to cause similarity in spouses' generalized trust. Indeed, genetics could be a factor for partners' matching (Domingue et al. 2014), but if genes do not affect generalized trust, then partners could be genetically similar and still dissimilar in their "trust in others". Even if some controversy might remain on whether Diffspousemother fulfills fully the exclusion restrictions, referring to Jones (2005), I recall that in the recursive system identification can be achieved just by functional form.

4 Results

The evidence convincingly demonstrates a causal effect of intergenerational (relative) income mobility on interpersonal trust. Starting with a general model for income change, regardless of whether it is upward or downward, the binary dummy *IMI* is highly significant in all model estimations (See Table 1). With an $IMindx^1$-based *IMI* in column (1), I obtain a negative sign for the main effect of interest, but this result should be considered with caution as $IMindx^1$ may not be a realistic measure given that it reflects perfectly the US Census division of personal income, including a very small share for "average" income. Varying $IMindx^1$ by extending the percentage share of the "average" personal income, i.e., using $IMindx^2$-based *IMI*, I obtain an intuitive positive result from the estimation in

Table 1 Trust and relative income mobility (upward/downward)

	(1)		(2)		(3)	
TRUST=1 if "can trust"	MLE coeff	ME	MLE coeff	ME	MLE coeff	ME
Age ≤ 25	−0.465	−0.170	**−0.575***	**−0.056***	**−0.430**	**−0.0623**
	(−1.62)		**(−2.09)**		**(−1.58)**	
25 < *Age* ≤ 35	−0.342	−0.131	**−0.0541**	**−0.0866**	**−0.0160**	**−0.0813**
	(−1.77)		**(−0.28)**		**(−0.08)**	
35 < *Age* ≤ 45	−0.244	−0.102	**0.0751**	**−0.0601**	**0.0937**	**−0.0551**
	(−1.31)		**(0.42)**		**(0.52)**	
45 < *Age* ≤ 65	0.0331	−0.0039	**0.314**	**0.0071**	**0.294**	**0.0086**
	(0.18)		(1.81)		(1.70)	
IMI	−1.244***	−0.364***	**1.475*** **	**0.306*** **	**1.432*** **	**0.289*** **
	(−4.63)		**(13.64)**		**(14.54)**	
Black	−0.376**	−0.136**	**−0.354***	**−0.0700***	**−0.295***	**−0.0647***
	(−2.63)		**(−2.57)**		**(−2.14)**	
Female	0.0742	0.0336	**−0.0797**	**0.0098**	**−0.0730**	**0.00831**
	(1.02)		**(−1.16)**		**(−1.07)**	
Educ	0.0860***	0.0311***	**0.0733*** **	**0.0220*** **	**0.0803*** **	**0.0190*** **
	(5.25)		**(4.48)**		**(5.18)**	
Res16	0.0104	0.0048	**−0.00887**	**0.0008**	**0.0059**	**−0.0019**
	(0.42)		**(−0.38)**		**(0.25)**	
Children	−0.121	−0.0441	**−0.154**	**−0.0187**	**−0.155**	**−0.0155**
	(−1.25)		**(−1.66)**		**(−1.68)**	
Religious	−0.0009	−0.0026	**0.0243**	**0.0059**	**0.0494**	**0.0018**
	(−0.01)		**(0.25)**		**(0.51)**	
IMI						
Age ≤ 25	−0.188	−0.170	**0.430**	**−0.0562**	**0.165**	**−0.0623**
	(−0.55)		**(1.33)**		**(0.54)**	
25 < *Age* ≤ 35	−0.248	−0.131	**−0.320**	**−0.0866**	**−0.364**	**−0.0813**
	(−1.03)		**(−1.54)**		**(−1.77)**	
35 < *Age* ≤ 45	−0.367	−0.102	**−0.325**	**−0.0601**	**−0.334**	**−0.0551**
	(−1.60)		**(−1.63)**		**(−1.70)**	
45 < *Age* ≤ 65	−0.375	−0.0039	**−0.318**	**0.0071**	**−0.281**	**0.00858**
	(−1.67)		**(−1.63)**		**(−1.46)**	
Black	0.0136	−0.136	**0.0789**	**−0.0700**	**0.00534**	**−0.0647**
	(0.09)		**(0.55)**		**(0.04)**	
Female	0.172*	0.0336*	**0.127**	**0.0098**	**0.112**	**0.0083**
	(2.11)		**(1.68)**		**(1.50)**	
Educ	−0.0055	0.0311	**0.00409**	**0.0220**	**−0.0104**	**0.0190**
	(−0.36)		**(0.29)**		**(−0.75)**	
Res16	0.0268	0.00480	**0.0129**	**0.0008**	**−0.0139**	**−0.0019**
	(0.96)		**(0.50)**		**(−0.54)**	
Children	−0.0096	−0.0441	**0.0979**	**−0.0187**	**0.104**	**−0.0155**
	(−0.09)		**(0.95)**		**(1.02)**	
Religious	−0.0628	−0.0026	**−0.0040**	**0.0059**	**−0.0466**	**0.0018**
	(−0.54)		**(−0.04)**		**(−0.44)**	
Diffspousemother	−0.0074***	−0.0003***	**0.0026**	**0.0007**	**0.0033***	**0.0008***
	(−3.54)		**(1.58)**		**(2.07)**	
ATE	−0.434***		**0.497*** **		**0.504*** **	
N	1205		**1205**		**1205**	
Wald chi2(22)	261.06		**580.02**		**598.7**	
LR test of indep. eqns. (rho = 0):						
chi2(1)	4.607		**2.803**		**3.959**	
Prob>chi2	0.0318		**0.0941**		**0.0466**	

Note: Biprobit fits a maximum-likelihood two-equation probit models of the binary variables *TRUST* and *IMI*
ME stands for Marginal Effects; t statistics in parentheses. In estimations (1) through (3) the binary dummy *IMI* is based on the differently defined indice $IMindx^1$, $IMindx^2$ and $IMindx^3$. Preferred estimations are printed in bold font
*$p<0.05$, **$p<0.01$, ***$p<0.001$

column (2). Moreover, this result gets confirmed by the estimation in column (3), using an $IMindx^3$-based *IMI*. The estimated average treatment effect (ATE) is around 0.50 when the effect of income mobility on trust is positive, implying that trust is increased by 50% if income mobility is present, relative to a situation in which intergenerational income positions stay stable. The secondary results on individual-level controls for trust are consistent with previous literature: an additional year of education is related with an increase in the probability of trust by 2–3%; race, if "black", correlates negatively with trust; very young respondents trust less, with the marginal effect (ME) associated with the dummy Age < 25 equal to -0.05; while females are more trusting (ME $= 0.03$). The statistical properties, listed at the bottom of Table 1, confirm the overall satistical significance of the model for the estimations (1) and (3). The null hypothesis of independent equations (rho $= 0$) is rejected with the values for $Prob > chi2$ less than 0.05, implying that $\rho \neq 0$, and that the bivariate probit model is appropriate.

Intuitively, I expect that positive and negative intergenerational income changes would affect trust differently, and hence, it is important to distinguish between them. As with the generally defined income change, *IMI*, in defining the dummies capturing upward and downward mobility–*IMIup* and *IMIdown*–the baseline case is one of persistence of parents' income positions. Compared to the general income mobility model, the separate models make it possible to get more precise estimates of intergenerational change in income influences on trust and subsequently of calculating more accurately the net causal effect of income mobility. The reason for that is that in comparing more homogenous groups, i.e., only those having experienced either downward or upward mobility with those with no income mobility, I can eliminate any bias coming from equally treating downward and upward income movements. Confirming intuition, the estimated ATE for *IMIup* is different in sign and size from the ATE for *IMIdown* (See Tables 2 and 3). Precisely, reading the robust results from columns (2) and (3), upward income mobility causes an increase of 35% in the probability of trust (ATE $= 0.35$) while downward mobility decreases it by around $30 - 32\%$. Thus, the resulting net ATE effect is equal to 3–5%. This result, along with the preliminary indication of a positive causal relationship between *IMI* and trust (See Table 1), is essential for conclusions as well as for policy implications.

Consistent with the initial predictions, in the separate model estimations, the probability of trust remains lower for black respondents and higher for the more educated (See Tables 2 and 3). In the sample focusing on "downward income movers," black respondents appear to have four times lower probablity of trust ($ME \approx 10 - 12\%$) than black respondents in the sample including the "upward income movers" ($ME \approx 3\%$). That distinction does not hold for education as an additional year of education seems to increase the probability of trust by 1–2% regardless of the type of income mobility experienced. Besides, age turns out significant only in the estimation for "upward income movers," suggesting a 5% increase in the probability of trust with one more year of age. But also, this effect would be decreasing over time as the squared term for age has a negative significant effect. Being female positively correlates with downward income change, while the evidence for gender and upward income change is weaker and inconclusive.

Finally, it is worth commenting whether the initial ambiguity on the sign of the income mobility effect has been resolved through decomposing positive and negative income change. For downward mobility, results are robust and convincingly suggest a negative causal impact. Whereas, for upward income mobility, when using *IMIup* based

Table 2 Trust and upward income mobility

	(1)		(2)		(3)	
TRUST=1 if "can trust"	MLE coeff	ME	MLE coeff	ME	MLE coeff	ME
Age	0.128***	0.0566***	**0.0139**	**0.0114**	**0.00915**	**0.0150**
	(−3.34)		**(0.46)**		**(0.30)**	
Agesq	−0.00114**	−0.0005**	**−0.0001**	**−0.0001**	**−0.0000**	**−0.0001**
	(-2.90)		**(−0.22)**		**(−0.03)**	
IMlup	−1.200***	−0.211***	**1.466*** **	**0.225*** **	**1.368*** **	**0.216*** **
	(−17.17)		**(7.92)**		**(6.60)**	
Black	−0.387	−0.106	**−0.517** **	**−0.0323** **	**−0.455** **	**−0.0377** **
	(−1.78)		**(−3.04)**		**(−2.78)**	
Female	−0.0994	−0.0752	**0.130**	**−0.0047**	**0.0940**	**−0.0061**
	(−0.96)		**(1.55)**		**(1.15)**	
Educ	0.0864***	0.0291***	**0.0557***	**0.0113***	**0.0698*** **	**0.0125*** **
	(−4.78)		**(2.40)**		**(3.31)**	
Res16	0.0405	0.0226	**−0.0096**	**0.0019**	**0.0240**	**0.0002**
	(−1.18)		**(−0.34)**		**(0.88)**	
Children	−0.0932	−0.0185	**−0.106**	**−0.0137**	**−0.144**	**−0.0149**
	(−0.65)		**(−0.93)**		**(−1.30)**	
Religious	0.0072	−0.0169	**0.0507**	**0.0051**	**0.0629**	**0.0014**
	(−0.05)		**(0.42)**		**(0.54)**	
IMlup						
Age	0.151**	0.0566**	**0.0675***	**0.0114***	**0.0899** **	**0.0150** **
	(−3.21)		**(2.36)**		**(3.21)**	
Agesq	−0.0014**	−0.0005**	**−0.0006***	**−0.0001***	**−0.0008** **	**−0.0001** **
	(−2.95)		**(−2.02)**		**(−2.87)**	
Black	0.021	−0.106	**0.222**	**−0.0323**	**0.145**	**−0.0377**
	(−0.09)		**(1.31)**		**(0.91)**	
Female	−0.239*	−0.0752*	**−0.163**	**−0.0047**	**−0.133**	**−0.0061**
	(−2.03)		**(−1.78)**		**(−1.53)**	
Educ	0.0653**	0.0291**	**0.0255**	**0.0113**	**0.0130**	**0.0125**
	(−3.21)		**(1.54)**		**(0.84)**	
Res16	0.0665	0.0226	**0.0230**	**0.0019**	**−0.0222**	**0.0002**
	(−1.71)		**(0.75)**		**(−0.76)**	
Children	−0.0239	−0.0185	**0.0126**	**−0.0137**	**0.0479**	**−0.0149**
	(−0.15)		**(0.10)**		**(0.40)**	
Religious	−0.083	−0.0169	**−0.0131**	**0.0051**	**−0.0534**	**0.0014**
	(−0.49)		**(−0.10)**		**(−0.43)**	
Diffspousemother	−0.0044	−0.0010	**0.0036**	**0.0005**	**0.0050***	**0.0007***
	(−1.81)		**(1.76)**		**(2.40)**	
ATE	−0.184***		**0.356*** **		**0.349*** **	
N	519		**804**		**873**	
Wald chi2(18)	333.57		**387.34**		**345.32**	
LR test of indep. eqns. (rho = 0):						
chi2(1)	2.802		**2.562**		**3.938**	
Prob>chi2	0.0941		**0.1095**		**0.0472**	

Note: Biprobit fits a maximum-likelihood two-equation probit models of the binary variables *TRUST* and *IMlup*
ME stands for Marginal Effects; t statistics in parentheses. In estimations (1) through (3) the binary dummy *IMI* is based on the differently defined indice $IMindx^1$, $IMindx^2$ and $IMindx^3$. Preferred estimations are printed in bold font
*$p<0.05$, **$p<0.01$, ***$p<0.001$

on $IMindx^1$, the negative result is counter-intuitive and inconsistent with the positive findings based on $IMindx^2$ and $IMindx^3$. An explanation for this estimate is the likely fault of the income mobility index, $IMindx^1$, to reflect the actual/realistic income distribution

Table 3 Trust and downward income mobility

	(1)		(2)		(3)	
TRUST=1 if "can trust"	MLE coeff	ME	MLE coeff	ME	MLE coeff	ME
Age	0.0238	0.00395	**−0.0217**	**−0.0242**	**−0.0158**	**−0.0268**
	(0.99)		**(−0.82)**		**(−0.56)**	
Agesq	−0.0001	−0.0000	**0.0003**	**0.0003**	**0.0003**	**0.0003**
	(−0.52)		**(1.21)**		**(0.99)**	
IMIdown	−1.238***	−0.357***	**−1.260*** **	**−0.251*** **	**−1.242*** **	**−0.212*** **
	(−4.77)		**(−9.12)**		**(−6.67)**	
Black	−0.362*	−0.125*	**−0.268**	**−0.0769**	**−0.397***	**−0.105***
	(−2.26)		**(−1.59)**		**(−2.29)**	
Female	0.177*	0.0781*	**0.239** **	**0.119** **	**0.234***	**0.128***
	(2.10)		**(2.77)**		**(2.51)**	
Educ	0.0706***	0.0224***	**0.0620** **	**0.0093** **	**0.0545***	**−0.0009***
	(3.52)		**(3.02)**		**(2.32)**	
Res16	0.0287	0.0111	**0.0097**	**0.0021**	**0.00958**	**0.0015**
	(1.04)		**(0.34)**		**(0.32)**	
Children	−0.211	−0.0731	**−0.115**	**0.0031**	**−0.134**	**−0.0023**
	(−1.96)		**(−0.98)**		**(−1.13)**	
Religious	−0.0334	−0.0129	**−0.0358**	**−0.0037**	**−0.0308**	**−0.0141**
	(−0.29)		**(−0.31)**		**(−0.25)**	
IMIdown						
Age	−0.0782**	0.0039**	**−0.111*** **	**−0.0242*** **	**−0.112*** **	**−0.0268*** **
	(−3.21)		**(−4.98)**		**(−5.00)**	
Agesq	0.0008**	−0.0000**	**0.0012*** **	**0.0003*** **	**0.0012*** **	**0.0003*** **
	(3.10)		**(4.96)**		**(5.10)**	
Black	−0.0098	−0.125	**−0.100**	**−0.0769**	**−0.203**	**−0.105**
	(−0.06)		**(−0.56)**		**(−1.10)**	
Female	0.319***	0.0781***	**0.387*** **	**0.119*** **	**0.426*** **	**0.128*** **
	(3.63)		**(4.35)**		**(4.60)**	
Educ	−0.0354*	0.0224*	**−0.0229**	**0.0093**	**−0.0448***	**−0.0009***
	(−2.11)		**(−1.35)**		**(−2.49)**	
Res16	0.0214	0.0111	**0.0003**	**0.0021**	**−0.0004**	**0.0015**
	(0.70)		**(0.01)**		**(−0.01)**	
Children	−0.0229	−0.0731	**0.121**	**0.0031**	**0.0726**	**−0.0023**
	(−0.19)		**(1.02)**		**(0.60)**	
Religious	−0.0251	−0.0129	**0.0206**	**−0.0037**	**−0.0421**	**−0.0141**
	(−0.19)		**(0.16)**		**(−0.32)**	
Diffspousemother	−0.0085***	−0.0004***	**−0.0043***	**−0.0008***	**−0.0047***	**−0.0010***
	(−3.74)		**(−2.25)**		**(−2.27)**	
ATE	−0.353***		**−0.296*** **		**−0.318*** **	
N	953		**844**		**807**	
Wald chi2(18)	257.99		**431.67**		**358.23**	
LR test of indep. eqns. (rho = 0):						
chi2(1)	5.698		**4.605**		**4.371**	
Prob>chi2	0.0170		**0.0319**		**0.0366**	

Note: Biprobit fits a maximum-likelihood two-equation probit models of the binary variables *TRUST* and *IMIdown*
ME stands for Marginal Effects; t statistics in parentheses. In estimations (1) through (3) the binary dummy *IMI* is based on the differently defined indice $IMindx^1$, $IMindx^2$ and $IMindx^3$. Preferred estimations are printed in bold font
*$p<0.05$, **$p<0.01$, ***$p<0.001$

of GSS respondents. Observing the significance of the identifying variable Diffspouse-mother only in the estimation with $IMindx^3$-based *IMIup* helps in highlighting as more credible the positive *IMIup* effect. Moreover, among the three estimations on *IMIup*, in accordance with the Likelihood ratio test, the overall significance of the model is best captured by the $IMindx^3$-based estimation.

In relation to the cited theories on relative economic status in Fischer and Torgler (2006), the current evidence suggests the implicit linkage between generalized trust

and perceptions of fairness through income mobility. Low current income position, or downward income mobility, and the expected, but unobserved, perceptions of others' unfairness would explain low generalized trust, while high income position, or upward income mobility, and positive perceptions of others would explain high generalized trust.

5 Policy Implications

Increasing income mobility, as defined here in relative terms, would entail a change in the percentage shares of both up and down income "movers," i.e., there will be winners and losers. Overall, however, social trust will be favorably affected if there is more intergenerational income volatility rather than if income positions were passed down from parents to children. The identified causality could be interpreted in terms of unobserved system's fairness and the perceptions arising from it. An environment that encourages education and equal opportunities would be conducive for trust through actual income mobility, among other possible channels. Regarding social trust, these results connect with existing evidence on the effects of education and social homogeneity while implicitly also suggesting equality of opportunity as another source of homogeneity for trust.

6 Conclusions

The evidence on income inequality and relative economic status on behavior and attitudes is still rare. Another way to study income inequality is to think about intergenerational income mobility. The way income mobility affects generalized trust could be quite informative for understanding the general impact of income mobility on the economy. The contribution of the paper is two-fold: first, it provides evidence for a causal relationship between the relative/intergenerational change in income positions and trust, and second, it makes it possible to consider income mobility policies as a feasible alternative to income redistribution. Results suggest that trust is affected positively when children have achieved an upward movement from their parents' income position, while it is decreased by the experience of downward income mobility. The majority of the findings are robust to a change of the definition of the income mobility measure. With a resulting positive net effect of income mobility, the paper recommends policies aimed at equality of opportunities and education. Further research could check the validity of these results with absolute income mobility measures and, if possible, also extend it beyond the US case.

Endnotes

[1] Adam Smith (1759/1976), Marx (1849) and Marshall (1961) are cited in Fischer and Torgler (2006).

[2] Thurow's (1973) reasons for inefficient and ineffective income redistribution are: insufficiently distinguished means and ends, difficulty to come up with a consistent decision on the alteration of the income distribution, inevitable infringement of property rights and internal policy contradictions. Prompted by the need to explain the puzzle of inefficient redistribution, Acemoglu and Robinson (2001) develop a theory model in which inefficient redistribution could be a tool to sustain political power.

[3] Previous studies have focused on inter-generational father-son or father-daughter correlation of earnings (Solon 1992; Chadwick and Solon 2002).

[4] GSS data is referenced as Smith et al. (2013).

[5] The model specification follows the description of a recursive biprobit model in Jones (2005).

Appendix

Table 4 Summary statistics

Variable	N	Mean	Std. Dev.	Min.	Max.
TRUST	1,205	0.46	0.499	0	1
= 0 if "cannot trust" or "depends"	*651*				
= 1 if "can trust"	*554*				
$Age \leq 25$	1,205	0.028	0.166	0	1
$25 < Age \leq 35$	1,205	0.195	0.396	0	1
$35 < Age \leq 45$	1,205	0.284	0.451	0	1
$45 < Age \leq 65$	1,205	0.452	0.498	0	1
$Age > 65$	1,205	0.0407	0.197	0	1
Age	1,205	45.468	11.694	19	88
Black	1,205	0.074	0.262	0	1
= 0 if "white" or "other"	*1,116*				
= 1 if "black"	*89*				
Female	1,205	0.504	0.5	0	1
= 0 if "male"	*598*				
= 1 if "female"	*607*				
Educ (years of education)	1,205	14.524	2.741	2	20
Res16	1,205	3.466	1.456	1	6
= 1 if "country,nonfarm"	*152*				
= 2 if "farm"	*100*				
= 3 if "town lt 50000"	*425*				
= 4 if "50000 to 250000"	*222*				
= 5 if "big-city suburb"	*174*				
= 6 if "city gt 250000"	*132*				
Children	1,205	0.829	0.377	0	1
= 0 if "no children"	*206*				
= 1 if "children"	*999*				
Religious	1,205	0.856	0.352	0	1
= 0 if "not religious"	*174*				
= 1 if "religious"	*1,031*				
Spouse prestige score	1,205	46.753	13.458	17	86
Mother prestige score	1,205	43.183	14.309	17	86
Diffspousemother	1,205	3.569	17.686	–54	55

Table 5 Categories of family income at age 16

Fincome (age 16) categories	Frequency	%
= 1 "Far Below Average"	81	6.72
= 2 "Below Average"	257	21.33
= 3 "Average"	587	48.71
= 4 "Above Average"	270	22.41
= 5 "Far Above Average"	10	0.83
Total	$N = 1,205$	100

Table 6 Respondents' income (*Rincome*) as of survey year (2006, 2008 & 2010)

under 1 000	17	1.41
1 000 to 2 999	21	1.74
3 000 to 3 999	12	1
4 000 to 4 999	16	1.33
5 000 to 5 999	16	1.33
6 000 to 6 999	9	0.75
7 000 to 7 999	8	0.66
8 000 to 9 999	26	2.16
10000 to 12499	52	4.32
12500 to 14999	32	2.66
15000 to 17499	27	2.24
17500 to 19999	26	2.16
20000 to 22499	51	4.23
22500 to 24999	42	3.49
25000 to 29999	67	5.56
30000 to 34999	97	8.05
35000 to 39999	93	7.72
40000 to 49999	154	12.78
50000 to 59999	112	9.29
60000 to 74999	108	8.96
75000 to 89999	83	6.89
90000 to 109999	53	4.4
110000 to 129999	39	3.24
130000 to 149999	12	1
150000 or over	32	2.66
Total	$N = 1{,}205$	100

Table 7 Respondent's income (*Rincome*) variables

Rincome		*Rincome*[1] ≈ US Census		*Rincome*[2] (Cat 1,2 & 3 ≠ US Census)	*Rincome*[3] ≈ % *Fincome*
= 1 "Far Below Average"	29.46 %	*Rincome* ≤ 24999	6.8 %	*Rincome* ≤ 5999	5.48 % ≈ 6.72 %
= 2 "Below Average"	34.11 %	25000 > *Rincome* ≤ 49999	22.66 %	6000 > *Rincome* ≤ 24999	20.5 % ≈ 21.33 %
= 3 "Average"	18.26 %	50000 > *Rincome* ≤ 74999	52.37 %	25000 > *Rincome* ≤ 74999	46.89 % ≈ 48.71 %
= 4 "Above Average"	11.29 %	75000 > *Rincome* ≤ 109999	11.29 %	75000 > *Rincome* ≤ 109999	24.48 % ≈ 22.41 %
= 5 "Far Above Average"	6.89 %	110000 > *Rincome*	6.89 %	110000 > *Rincome*	2.66 % ≈ 0.83 %

Cat 1,2 & 3 refer to the shares of respondents falling in categories "Far Below Average", "Below Average" & "Average"

Table 8 Descriptives of IMI measures

Rincome categories	$IMindx^1$		$IMindx^2$		$IMindx^3$	
	Frequency	%	Frequency	%	Frequency	%
= −4	5	0.41	1	0.08	1	0.08
= −3	55	4.56	19	1.58	15	1.24
= −2	259	21.49	74	6.14	68	5.64
= −1	367	30.46	307	25.48	248	20.58
= 0	267	22.16	443	36.76	475	39.42
= 1	152	12.61	240	19.92	279	23.15
= 2	76	6.31	97	8.05	94	7.80
= 3	20	1.66	20	1.66	25	2.07
= 4	4	0.33	4	0.33	.	.
Total	$N = 1,205$	100	$N = 1,205$	100	$N = 1,205$	
IMI						
0 if $IMindx = 0$	267	22.16	443	36.76	475	39.42
1 if $IMindx \neq 0$	938	77.84	762	63.24	730	60.58
Total	$N = 1,205$	100	$N = 1,205$	100	$N = 1,205$	100
IMIup						
0 if $IMindx = 0$	267	51.45	443	55.10	475	54.41
1 if $IMindx > 0$	252	48.55	361	44.90	398	45.59
Total	$N = 519$	100	$N = 804$	100	$N = 873$	100
IMIdown						
0 if $IMindx = 0$	267	28.02	443	52.49	475	58.86
1 if $IMindx < 0$	686	71.98	401	47.51	332	41.14
Total	$N = 953$	100	$N = 844$	100	$N = 807$	100

Note: $IMindx^i = Rincome^i - Fincome$ where i = 1,2 and 3

Table 9 Evidence for positive assortative mating

	Correlations (N)
Education	
Respondent and spouse's degrees (highest)	0.4667 (1,203)
Respondent and spouse's years of school	0.5476 (1,200)
Job prestige scores	
Respondent and spouse	0.3066 (1205)
Mother and father	0.3841 (1205)

Table 10 Diffspousemother: predicting income mobility

	Correlations (N)
Spouse's job prestige score and *Rincome*	0.1907 (1205)
Mother's job prestige score and *Fincome*	0.2458 (1205)
Diffspousemother and *IMI*	–0.0827 (1205)
Diffspousemother and respondent's job prestige score	0.0507 (1205)
Mother's and respondent's job prestige scores	0.2257 (1205)

Table 11 Ocuppations & prestige scores

1980 Census occupational category	1980 Census code	1989 GSS prestige score
Miscellaneous Food Preparation Occupations	444	17 (min)
Legislators	3	61
Chief Executives and General Admin., Public Admin.	4	70
Administrators and Officials, Public Administration	5	51
Administrators, Protective Service	6	54
Financial Managers	7	59
Personnel and Labor Relations Managers	8	54
Purchasing Managers	9	63
Managers, Marketing, Advertising, and Public Relations	13	59
Administrators, Education and Related Fields	14	64
Managers, Medicine and Health	15	69
Managers, Properties and Real Estate	16	39
Postmasters and Mail Superintendents	17	53
Funeral Directors	18	49
Managers and Administrators, n.e.c.	19	51
Accountants and Auditors	23	65
Underwriters	24	48
Other Financial Officers	25	48
Management Analysts	26	61
Personnel, Training, and Labor Relations Specialists	27	43
Purchasing Agents and Buyers, Farm Products	28	42
Business and Promotion Agents	34	51
Construction Inspectors	35	47
Inspectors/Compliance Officers, Except Construction	36	50
Management Related Occupations, n.e.c.	37	49
Architects	43	73
Aerospace Engineers	44	72
Economics Teachers	119	74
Physicians	84	86 (max)

Note: This is an extract from the 1989 GSS occupational prestige rating at: http://publicdata.norc.org:41000/gss/documents/BOOK/GSS_Codebook.pdf, Appendix F

Competing interests
The IZA Journal of Labor and Development is committed to the IZA Guiding Principles of Research Integrity. The author declares that she has observed these principles.

Acknowledgements
The author is grateful to her supervisor, Fidel Perez, Department of Economic Analysis, University of Alicante, for his patient guidance, encouragement and helpful advice. She would also like to thank for feedback on a previous version to Elena Martinez Sanchis, David Cuberes, Asier Mariscal, Juan Mora, Pedro Albarran and Lola Collado. She would also like to acknowledge useful feedback from Kirill Borissov at the XV Conference on International Economics and from several anonymous referees. Funding from the Department of Economic Analysis, University of Alicante, and from the European Commission, Joint Research Centre (JRC), is gratefully acknowledged.
Responsible editor: Hartmut Lehmann

Received: 9 April 2015 Accepted: 11 August 2015
Published online: 25 September 2015

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