ORIGINAL RESEARCH

Does Community Level Trust Improve Self-Rated Welfare?

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Abstract

Positive outcomes of community social trust include the generation of new employment opportunities; higher levels of support for public welfare, healthcare, and education; better developed democratic administration, and more effective institutions. These outcomes are in turn believed to facilitate the reduction of poverty. As such, this paper analyses the effects of community-level trust on self-rated welfare. Our hypothesis was that higher levels of community trust would lead to higher welfare. We tested this hypothesis on a diverse sample of 27 post-communist countries in Eastern Europe and the former Soviet Union using data from the 2010 and 2016 rounds of the Life-in-Transition survey. Through estimating a series of instrumental variable regressions, we found a significant causal effect of community trust on household welfare in both the total sample and in regional samples. This effect remains robust for: (1) alternative sets of covariates, (2) control for individual-level trust, and (3) an alternative definition of community trust. Thus, the theoretical contribution of this paper is that we have empirically proven that which was assumed by previous studies, namely, that community social trust has a positive causal association with reducing poverty.

Keywords Central Asia · Caucasus · Eastern Europe · Southern Europe · Subjective wellbeing

1 Introduction

Self-rated welfare is one of the concepts that is most widely used for measuring wellbeing based on an individual's own assessment (Ravallion and Lokshin 2002; Selezneva 2011; Cojocaru and Diagne 2015; Habibov and Afandi 2017). Self-rated welfare involves an individual's assessment of their household position on the welfare ladder for

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the purpose of ascertaining whether their household is assessed at being poor, wealthy, or in the middle (Ravallion and Lokshin 2002; Rifault 1991). Other concepts involved in subjective wellbeing include, but are not limited to, life satisfaction, happiness, confidence in a better life, subjective self-stratification and quality of life (Rodriguez-Pose and Maslauskaite 2011; Habibov and Afandi 2009; Verbič and Stanovnik 2006; Ravallion and Lokshin 2001; Abbot et al. 2011; Hayo and Seifert 2003). Subjective measures are important since they are strongly associated with objective measures and they provide a much richer picture of society by taking the individual's subjective perceptions of their life situation that is based on their lived experience into consideration (Anwar and Aisha 2016; Selezneva 2011; Habibov 2011; Habibov and Afandi 2015). Furthermore, the above-mentioned strong association between subjective wellbeing and objective measures such as income, expenditures, and wealth, may not always be observed over longer time periods, leading to the situation where improvement in the objective indicators of wellbeing do not translate to significant improvement in the wellbeing of individuals based on their own assessment. This situation is known as Easterlin's paradox (Guriev and Zhuravskaya 2009; Easterlin 2009; Rodriguez-Pose and von Berlepsch 2014). Finally, the degree of support for government policy depends to a large extent on the individual's assessment of their own wellbeing since people are the best judges of their own circumstances (Gruen and Klasen 2012; Sanfey et al. 2007; Djankova et al. 2016).

Much effort has recently been devoted to identifying and gauging the effects of generalized interpersonal social trust (henceforth trust) on the subjective indicators of wellbeing [see recent literature reviews by Selezneva (2011) and Mironova (2015)]. Generalized interpersonal trust is one of the most important elements of social capital, and can be defined as a belief that most people can be trusted (Jovanovic 2016; Uslaner 2015). It represents a horizontal dimension of social capital and indicates abstract assessments of fellow citizens who are unknown "others" in terms of moral standards (Sturgis et al. 2015). In accordance to Social Learning Theory, trust suggests the belief that others can be relied upon with respect to their words (Rotter 1971). A number of previous studies found significant, but relatively modest or weak correlation between trust at individual level, and life satisfaction and happiness (Selezneva 2011; Mironova 2015).

With this in mind, the unique contributions of this study are threefold. First, as far as we know, this is the first study that directly tests the effect of contextual community level trust on self-rated welfare. We conceptualise and test the effect of trust as a collective resource that is raised and maintained at the contextual community level (Coleman 1988; Putnam 2000). In the next section of the paper, we discuss the research literature that suggests multiple possible causal mechanisms that may help translate higher levels of community level trust into higher self-rated welfare. Although the such possible mechanisms are frequently mentioned in the literature, the direct effect of community trust on self-rated welfare has not yet been studied empirically. Hence, such an assumption remains problematic until it is tested and confirmed empirically. Thus, we empirically hypothesize a positive effect of community level trust on self-rated welfare for a sample of 27 countries over a 5-year period, and with respect to a wide range of alternative explanations of poverty.

At the same time, it should be highlighted that most previous studies have focused on life satisfaction and happiness, not self-rated welfare. Although these measures may be correlated among themselves, the results of estimations can vary significantly depending on which measures are employed (Haller and Hadler 2006; Galinha and Pais-Ribeiro 2008). Thus, in contrast to the majority of previous studies on subjective wellbeing, we chose to focus on a direct question that pertained to self-rated welfare so as to render the results

of our estimations more relevant to poverty reduction efforts (Rifault 1991; Ravallion and Lokshin 2001, 2002).

Second, most of the previous studies used cross-sectional designs, and hence suffered from endogeneity in the forms of reverse causality, unobserved variables, and measurement error. Indeed, it is plausible to conceive that the true effect may run in the opposite direction, from self-rated welfare to social trust, if a rise in poverty within a community leads to a weakened level of trust (Bjørnskov 2007; Cojocaru and Diagne 2015). It is also plausible that the causality may run from some third unobservable variable, for example, a history of having been poor, to both current self-rated welfare and trust of other people (Habibov et al. 2017a; Ferrer-i-Carbonell 2005). Lastly, since both trust and self-rated welfare are attitudinal variables, their measurement is likely to be associated with a significant amount of measurement error (Edlund 2006). If this issue is not properly considered, endogeneity may lead to either the under-estimation or over-estimation of the true effect of trust (Daniele and Geys 2015). In contrast to previous studies, we employ an instrumental variable approach to significantly reduce endogeneity and to quantify the true effects of community trust.

Finally, while most of the previous studies were conducted in developed countries, our study focuses on post-communist countries, thus providing a uniquely rich and interesting context through which to study the effects of trust on poverty. On the one hand, the context of post-communist countries is characterized by lower levels of trust that developed due to systematic suppression by the state during the communist era (Paldam and Svendsen 2001). Even after the collapse of communism, the levels of trust in post-communist countries remain lower than in developed countries (Lissowska 2013). In addition, the 2008 global crisis further reduced trust in these countries (Habibov and Afandi 2015). On the other hand, while post-communist transition resulted in increased political and civil freedoms, socio-economic indicators such as employment, inflation, inequality, and poverty oftentimes worsened (Gruen and Klasen 2012). Even though the gap in subjective wellbeing between post-communist and developed countries has reduced over time, these two groups seemed to be divided by what Lelkes (2006, p. 173) described as "an iron curtain" behind which post-communist countries remained, especially those from the former Soviet Union, with higher levels of poverty and lower levels of subjective wellbeing. Thus, our aim is to investigate whether the effect of trust on poverty can be identified within the context of relatively weak levels of trust and relatively high levels of poverty.

1.1 Theoretical Framework: Hypothesized Causal Effect of Community Trust on Self-Rated Welfare

In this theoretical framework, we discuss several main causal mechanisms that may help translate higher levels of community trust into higher levels of self-rated welfare. First, one of the main features of trust is that it decreases social and economic transaction costs by reducing the needs for formal contracts, legal and regulatory frameworks, and for expensive and burdensome enforcement and coercive apparatuses (Sturgis et al. 2015). By allowing individuals to interact in safe and predictable ways, trust encourages employment and other income-generating strategies (Narayan and Pritchett 1999; Bjørnskov 2008). Indeed, community trust is associated with better employment opportunities and successful entrepreneurship, which in turn function to reduce poverty (Kwon et al. 2013; Freitag and Kirchner 2011). Another strong argument in favour of the positive impact of community trust on income-generating opportunities is provided by Habibov and Cheung (2017a) who

investigated the effects of community trust on strategies for coping with the 2008 global crisis in 28 countries. The authors reported that trust is positively associated with active income generation strategies, namely, getting an additional job, working more hours on existing jobs, and opening a new business. At the same time, higher levels of trust reduce the use of passive depleting strategies when dealing with the results of crisis, namely, cutting expenditures on staple goods, leisure, healthcare, education, and utilities.

Second, trust is often viewed as "the expectation of cooperation" and as such it can mitigate problems of collective action (Pruitt and Kimmel 1977, p. 375). Citizens need to maintain certain levels of trust in each other so as to be able to cooperate successfully in addressing acute social problems such as poverty and inequality that could not be addressed through the actions of individuals alone (Fykayama 1995; Keefer and Knack 2002). Trust is associated with higher degrees of cooperation and solidarity, as well as the willingness to address social problems collectively (Sønderskov 2011; Sabatini et al. 2014). Hence, community trust plays the role of a "public good" that has a positive spillover effect on all community members (Putnam 2000). Trust facilitates collective actions within the community in order to mobilize the resources for public services that reduce citizens' spending on these services and hence reduce poverty and improve the overall wellbeing of the population (Kim et al. 2011; Habibov and Cheung 2017a). As an illustration, Habibov et al. (2017a) reported that a one unit increase in trust lead to an approximately 18 percentage point increase in the propensity to support redistribution through social welfare programs aimed at the needy. Likewise, Habibov et al. (2017b) found that a one unit increase in trust lead to an increase of about 20 percentage points in the propensity to pay more taxes to improve public healthcare.

Third, trust oils the wheels of democratic politics through rewarding trustworthy behaviour and applying social sanctions, for instance, ostracism and shame, to those who violate trust (Stolle 2003; Knack 2002). Trust is associated with a more efficient judiciary and a higher quality of bureaucracy and tax compliance (La Porta et al. 1997; Collier 2002). Higher levels of community trust are a precursor for the efficient administration of democracy, better control of community property, higher reliability of market transactions, and higher level of consultative decision-making (Narayan and Pritchett 1999; Maluccio et al. 2000). The considerable positive effect of trust in post-communist countries can be seen through a case study of the province of Novgorod in Russia (Petro 2001). Within the province of Novgorod, a dramatic shift was evidenced over time between a high level of distrust to a high level of trust. This shift was attributed to a rapid economic recovery that occurred as a result of a move towards increased democracy and accelerated economic growth.

Finally, there are physiological mechanisms that link trust to subjective wellbeing. Since trust facilitates closer relationships between individuals, it leads to higher levels of perceived social support (Siedlecki et al. 2014). In turn, having someone to rely on in the community is associated with improvement in subjective wellbeing (Lucas and Dyrenforth 2006; Jovanovic 2016). High levels of trust lead to an improved sense of control over one's life, which is an important precursor to subjective wellbeing (Grob 2000).

This theoretical framework permits us to propose the following testable hypothesis:

Hypothesis 1 Higher levels of community trust will lead to increases in self-rated welfare.

2 Method

2.1 Data

In order to test the above-mentioned hypothesis, we use the 2010 and 2016 rounds of the Life-in-Transition survey (LITS). LITS is a cross-sectional survey conducted by the European Bank for Reconstruction and Development and the World Bank to measure wellbeing in 27 post-communist countries, namely, Albania, Armenia, Azerbaijan, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Ukraine, and Uzbekistan (EBRD 2010, 2016). Each round of the survey covers about 1000 respondents in each of the surveyed countries though a multistage clustering design. An in-depth discussion of the LITS sampling design, response rates, and socio-demographic characteristics of the sample can be found in Habibov et al. (2017b) and Habibov and Cheung (2017b).

2.2 Outcome: Subjective Poverty

The LITS measures self-rated welfare through the statement, "Please imagine a ten-step ladder where on the bottom, the first step stands for the poorest 10% of people in our country, and on the highest step, the tenth, stands the richest 10% of people in our country." It then asks respondents which step of the ten steps they believe that their household is on today. Using such a direct question about subjective poverty renders the results of our estimation more relevant to poverty reduction efforts (Ravallion and Lokshin 2001, 2002; Rifault 1991). Thus, our outcome variable is continuous and varies between 1 if a respondent assesses that her/his household belongs to the poorest 10% of households in the country and 10 if a respondents assesses that her/his household belongs to the wealthiest 10% of households in the country (mean = 4.38; SD = 1.68; min = 1; max = 10).

The descriptive statistics for the sample, including outcome variable, predictor, and all covariates can be found in Table 1. The table reports mean, standard deviation, maximum and minimum for all variables as well as a source of data for each variable.

2.3 Predictor: Community Trust

The LITS operationalizes trust by asking respondents: "Generally speaking, would you say that most people can be trusted, or that you can't too careful in dealing with people?". Possible responses vary from 0 to 5, where 0 denotes "complete distrust" and 5 denotes "complete trust". Following previous studies, we averaged this data for each community to estimate community level trust (Kim et al. 2011; Campos-Matos et al. 2015). Thus, our predictor is percentage of respondents expressing trust or complete trust in people in a given community (mean = 0.47; SD = 0.24; min = 0; max = 1).

2.4 Covariates: Controlling for Alternative Explanations of Self-Rated Welfare

We control for a wide range of alternative explanations for self-rated welfare. Poverty is a household characteristic since an individual cannot be poor in non-poor household.

Table 1 Descriptive statistics and sources of data

	Description	Mean (%)	SD	Min	Max	Source
Outcome variable						
Self-rated welfare	Continuous variable = 1 if respondent assess that his/her household is among the poorest 10% of households in the country and = 10 if respondent assess that his/her household is among the wealthiest = 10% of households in the country.	4.38	1.68	1	10	LITS
Predictor						
Community trust	Percentage of respondents expressing trust or complete trust in people in a given community	47.36	0.24	0	1	LITS
Objective indicator of well-being						
Expenditure tertiles	Continuous variable indicating tertile (33.33%) of total household expenditures adjusted for household size for each country (1 = poorest tertile; 2 = middle tertile; 3 = wealthiest)	2.00	0.82	1.00	3.00	LITS
Wealth tertiles	Continuous variable indicating tertile (33.33%) of household wealth based on Principal Component Analysis for each country (1 = poorest tertile; 2 = middle tertile; 3 = wealthiest)	2.00	0.74	1.00	3.00	LITS
Household characteristics						
Female	= 1 if respondents are women, = 0 if otherwise	58.96		1	0	LITS
Age: 18–24	= 1 if respondents are 18–24 years old, = 0 if otherwise	9.74				LITS
Age: 25–34	= 1 if respondents are 25–34 years old, = 0 if otherwise	18.41		0	1	LITS
Age: 35–44	= 1 if respondents are 35–44 years old, = 0 if otherwise	17.99		0	1	LITS
Age: 45–54	= 1 if respondents are 45–54 years old, = 0 if otherwise	17.34		0	1	LITS
Age: 55–64	= 1 if respondents are 55–64 years old, = 0 if otherwise	16.75		0	1	LITS

Table 1 (continued)

	Description	Mean (%)	SD	Min	Max	Source
Age: 65+	=1 if respondents are 65+ years old, =0 if otherwise	19.76		0	1	LITS
Married	=1 if respondents are married, =0 if otherwise	58.92		0	1	LITS
University education	=1 if respondents have Bachelor's degree or higher, =0 if otherwise	20.18		0	1	LITS
Unemployed	=1 if respondents are unemployed, =0 if otherwise	44.21		0	1	LITS
Proportion of younger children	Proportion of children under 7 years old in a household	0.06	0.13	0.00	0.75	LITS
Proportion of older children	Proportion of children (7–17 years old) in a household	0.08	0.16	0.00	1.00	LITS
Proportion of adult women	Proportion of adult women (18–64) in a household	0.35	0.27	0.00	1.00	LITS
Proportion of adult man	Proportion of adult men (18–64) in a household	0.30	0.27	0.00	1.00	LITS
Proportion of pensioners	Proportion of pensioners in a household	0.19	0.35	0.00	1.00	LITS
FSU	=1 if household resides in countries of the former Soviet Union or Mongolia	44.83		0	1	LITS
Instrumental variable						
Community length of residency	Percentages of respondents who lived whole life in a given community	54.95	0.30	0	1	LITS
Variables for robustness analysis						
GDP annual growth (%)	GDP annual growth in percentage	−0.67	5.58	−14.60	7.20	World Development Indicators Database[a]
GDP per capita	GDP per capita adjusted by Purchasing Power Parity (PPP)	16,167.18	8742.87	1957.60	34,048.20	World Development Indicators Database[a]
Human Development Index	Human Development Index (HDI) is a composite statistics that encompasses indicators of life expectancy, education and per capital income. Higher value of the index indicates higher level of human development	0.77	0.07	0.60	0.89	Human Development Reports[b]
Poverty rate	The proportion of a population below the poverty line.	18.23	8.37	2.70	38.80	World Development Indicators Database[a]

Table 1 (continued)

	Description	Mean (%)	SD	Min	Max	Source
Gini	Gini coefficient in percentage. Higher percentage indicates more inequality	31.65	4.66	23.70	42.80	World Development Indicators Database[a]
Social benefit	Amount of social transfers to population as a percentage of GDP	11.81	4.95	1.55	18.10	Government Finance Statistics Yearbook[c]
Individual level trust	= 1 if respondents expressed some or complete trust into people, = 0 if otherwise	46.55		0	1	LITS
Community wallet	Suppose you lost your (purse/wallet) containing your address details, and it was found in the street by someone living in this neighborhood. How likely is it that it would be returned to you with nothing missing? Response = 1 not at all likely; = 2 not very likely; = 3 quit likely; = 4 very likely	2.12	0.55	1	4	LITS

Data are rounded up

[a]World Development Indicators Database (World Bank, n.d.)

[b]Human Development Reports (UNDP, n.d.)

[c]Government Finance Statistics Yearbook (IMF 2009)

Thus, the main alternative explanation of subjective poverty is household objective welfare (Cojocaru and Diagne 2015). To control for objective household status, we use (1) total household expenditures and (2) household wealth. As suggested by Habibov (2012), we use household expenditures as an indicator for household welfare for three main reasons: (a) income typically fluctuates due to wage and benefit arrears, and depends on the time of year due to seasonality in production, while consumption is smoothed out through the use of savings or loans; (b) income tends to be more underreported than expenditures; (c) income is traditionally less important in many post-communist countries where the population relies on the consumption of goods that have been produced in its own household and on goods that have been bartered with other households. Thus, we compute total household expenditure and adjust it by using an equivalence scale that divides household total expenditures by the square root of household size. The last step is to divide the adjusted total household income to three equal tertiles (33.33%) for each country in each round of the survey, where the lowest tertile represents the poorest households in the country and the highest tertile represents the wealthiest households. Using tertiles allows us to directly compare the poorer and the wealthier households across countries and rounds of the survey since the households in the poorest tertile in Tajikistan can be compared to households in the poorest tertile in Poland across the rounds of the survey. Consequently, household expenditures are represented by a continuous variable which indicates tertiles of household expenditures where 1 = the poorest tertile; 2 = the middle tertile; and 3 = the wealthiest tertile (mean = 2; SD = 0.82; min = 1; max = 3). Overall, we expect that living in the higher tertiles of household expenditure will be associated with higher self-rated welfare.

Second, we use a household wealth index that is calculated using easy-to-collect data on a household's ownership of selected assets such as TVs, computers, and cars. The advantage of the wealth index is that it reflects long-term household wealth (Habibov 2012). Thus, we use principal components analysis to compute a wealth score for every household in each country and in each round of the survey. The resulting scores are standardized in relation to a standard normal distribution with a mean of zero and a standard deviation of one, and then divided this into three tertiles—poorest, middle, and wealthiest. As a result, household wealth index is represented by a continuous variable that indicates tertiles of household wealth where 1 = the poorest tertile; 2 = the middle tertile; and 3 = the wealthiest tertile (mean = 2; SD = 0.74; min = 1; max = 3). Overall, we expect that living in the higher tertiles of household wealth will be associated with higher self-rated welfare.

We also control for household head and household composition. Previous studies in post-communist countries suggest that a male-lead, younger, university educated, employed, and married household head will be associated with lower poverty, while a higher proportion of children, women, and elderly in a household will be associated with higher levels of poverty (Brück et al. 2010; Habibov 2012). Thus, we control for the household head's education (a dummy for university education), sex (a dummy for female), age (in age groups of 18–24; 25–34; 35–44; 45–54, 55–64, and 65+), employment (a dummy for unemployed) and marital status (a dummy for married). Besides, we control for the proportions of small children (under 7) and older children (8–17), adult women and men (18–64), and seniors (65+) in the household.

In addition to household-level characteristics, it is plausible to believe that contextual country-level factors such as such as current beliefs about poverty and history of attitudes towards poverty may influence self-rated welfare. It is similarly plausible that time-variant factors such as socio-economic conditions, transitional reforms and their outcomes, and changes in expectations regarding what constitutes poverty and wealth may also influence self-rated welfare. For instance, it is reasonable to expect that poverty will have been higher

in 2010, just 2 years after the 2008 Global Financial Crisis, than in 2016, by which time the economy had mostly recovered. Unfortunately, systematic data about factors for post-communist countries over the period of investigation (2010–2016) is consistently lacking, especially for the Central Asia, the Caucasus, and the Balkans. Consequently, to control for the unobserved influence of country-level and time-variant factors, we include country and year dummies in our estimations (Habibov and Cheung 2017a). However, in the Robust-ness Analysis section below, we control for a selected number of post-communist countries for GDP per capita, GDP annual growth, poverty and inequality level of the country, the Human Development Index, and the share of public social benefits as a percentage of GDP (descriptive statistics and sources for all variables used in the robustness analysis section can also be found in Table 1 under subheadings variables for robustness analysis).

3 Model Set Up

The most straightforward way to estimate the effect of community trust on subjective poverty is to estimate classic OLS, where the outcome variable is self-rated welfare, and community trust is one of the correlates. However, as discussed in the introductory sec-tion, such a naive approach is likely to be biased due to the endogeneity caused by reverse causality, unobserved variables, and measurement error problems. Thus, we estimate the instrumental variable (IV) regression model that addresses endogeneity (Baum 2006; Nichols 2007). The IV model consists of two OLS equations. In the first-stage equation, community trust is regressed on the covariates and the instrument:

$$\text{Community trust} = \alpha_1 \text{ Instrument} + \alpha_2 \text{ Covariates} + \text{Country dummies}$$
$$+ \text{ Year dummies} + \text{Constant} + \text{Error}$$

While in the second, so-called main equation, self-rated welfare is regressed on the covari-ates and on the value of community trust that has been estimated in the first equation:

$$\text{Self - rated welfare} = \beta_1 \widehat{\text{Community trust}} + \beta_2 \text{ Coveriates} + \text{Country dummies}$$
$$+ \text{ Year dummies} + \text{Constant} + \text{Error}$$

The challenge of using the IV approach is to find an instrument that is correlated with the predictor but that does not have a direct effect on the outcome other than through the predictor.

Our instrument is the percentage of respondents who have lived their whole life in a given community. The choice of the instrument is based on the idea that the longer a com-munity member has lived of their life in the community, the higher their trust will be in this community. In accordance to our argument, several previous studies have found that the longer a household has lived in a community is positively correlated with community trust although it does not have a significant direct effect on household welfare (Adepoju and Oni 2012; Atemnkeng and Vukenkeng 2016; Glaeser et al. 2000). Hence, our instrument is a share of respondents who lived whole life in a given community (mean = 0.55; SD = 0.30; max = 0; min = 1).

We conducted several empirical tests to demonstrate that the percentage of respond-ents who lived their whole life in a community is significantly correlated with community trust in our sample (Baum 2006; Nichols 2007). First, according to all our estimations,

the first-stage F-statistic is statistically significant and larger than 10, demonstrating that the instrument and the predictor are strongly correlated. Second, according to all our estimations, the Stock and Yogo 10% critical value is lower than the first-stage F-statistics in all estimations, further validating that our instrument is not weak. Third, as shown in 'Appendix 1', which reports the results of the first-stage equation for all estimations, the instrument is positively and significantly correlated with community trust. Lastly, in all our estimations, the results of the Durbin and Wu-Hausman tests indicate the presence of significant endogeneity and suggest that the results of the IV regression should be preferred over the results of classic OLS.

It must be noted that there is no formal statistical test to rule out the possible direct effect of the instrument on the outcome variable in the milieu of IV regression with a single instrument (Baum 2006). However, in our case, the correlation between the instrument and the outcome is very weak ($r = 0.0006$). Such a result signals that the effect of the instrument on the outcome variable is likely to be negligible.

To isolate the effects of potentially correlated covariates, our estimation strategy involves computing several consecutive IV models. Our first model includes only community trust with year and country dummies. This baseline model, which serves as a benchmark model for all the following models and shows the effects of community trust on subjective poverty that is unadjusted for the influence of covariates. The second model includes household head covariates, while the next two models add household wealth and expenditure. Finally, Model 5, which is our main model, incorporates all covariates. For comparison purposes, we also estimated an OLS model similar that of our main Model 5 in order to gauge the difference between the effect of community trust estimated by IV and classic regressions.

4 Results

4.1 Main Results

The results for the whole sample of 27 post-communist countries are reported in Table 2. To conserve journal space, we report the effects of the main-stage of IV, while the results of the first-stage are available in Table 6 in 'Appendix 1'. Model 1 reports the effects of community trust on self-rated welfare while controlling for the 2016 dummy and country dummies. As shown, there is a positive and significant effect of community social trust on welfare. Thus, the benchmark model supports Hypothesis 1. As expected, the results for the 2016 dummy suggest that living in 2016, 8 years after 2008 Global Financial Crisis is associated with a higher welfare as compared to living in 2010, just 2 years after the crisis.

A set of household head characteristics was added in Model 2. The effects of community trust and the 2016 dummy remained positive and significant. Having university education and being younger and married is associated with higher welfare, while being unemployed is associated with lower welfare. Thus, the results for household head characteristics is also in line with our expectations.

Tertiles for household wealth and expenditures are added in Models 3 and 4. The results suggest that living in the higher tertiles is associated with higher welfare. Interestingly,

Table 2 Results for the whole sample of 27 countries with IV and OLS regressions

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	2SLS	2SLS	2SLS	2SLS	2SLS	OLS
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)
Community trust	5.563***	4.874***	5.265***	6.963***	6.914***	0.545***
	(0.809)	(0.671)	(0.669)	(1.518)	(1.513)	(0.028)
Female		0.031	0.038*	−0.001	0.002	0.019
		(0.017)	(0.017)	(0.025)	(0.026)	(0.017)
Age 25–34		−0.222***	−0.148***	−0.136*	−0.099	−0.175***
		(0.035)	(0.036)	(0.054)	(0.055)	(0.035)
Age 35–44		−0.458***	−0.382***	−0.413***	−0.365***	−0.336***
		(0.035)	(0.036)	(0.053)	(0.054)	(0.036)
Age 45–54		−0.574***	−0.476***	−0.492***	−0.473***	−0.471***
		(0.035)	(0.036)	(0.052)	(0.052)	(0.034)
Age 55–64		−0.741***	−0.593***	−0.620***	−0.599***	−0.557***
		(0.035)	(0.037)	(0.055)	(0.054)	(0.035)
Age 65+		−0.754***	−0.506***	−0.493***	−0.346***	−0.375***
		(0.037)	(0.038)	(0.058)	(0.067)	(0.044)
Married		0.337***	0.242***	0.227***	0.220***	0.239***
		(0.018)	(0.018)	(0.026)	(0.029)	(0.019)
University educated		0.453***	0.315***	0.252***	0.257***	0.315***
		(0.021)	(0.022)	(0.034)	(0.033)	(0.020)
Unemployed		−0.306***	−0.232***	−0.187***	−0.183***	−0.272***
		(0.021)	(0.022)	(0.036)	(0.036)	(0.019)
Wealth tertiles			0.448***	0.371***	0.362***	0.385***
			(0.012)	(0.018)	(0.019)	(0.012)
Expenditure tertiles				0.231***	0.229***	0.215***

Table 2 (continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	2SLS	2SLS	2SLS	2SLS	2SLS	OLS
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)
				(0.016)	(0.016)	(0.010)
Proportion of younger children					− 0.024	− 0.150*
					(0.113)	(0.072)
Proportion of older children					0.044	− 0.084
					(0.097)	(0.061)
Proportion of adult women					0.093**	0.019
					(0.029)	(0.015)
Proportion of adult men					0.173*	0.067
					(0.068)	(0.041)
Proportion of pensioners					0.005	0.001
					(0.007)	(0.005)
Year 2016	0.458***	0.472***	0.532***	0.600***	0.587***	0.312***
	(0.043)	(0.037)	(0.038)	(0.073)	(0.075)	(0.024)
N	69,375	60,874	59,514	39,408	39,408	39,408
Wald test for equality of coefficients in the model	2545.24***	5711.64***	6582.81***	3480.97***	3518.53***	
F-statistics for equality of coefficients in the model						191.96***
Testing instrument relevancy						
First stage F statistics	89.72***	110.39***	116.69***	31.31***	31.24***	
Minimum eigenvalue statistics	89.72	110.39	116.69	31.31	31.24	
Stock and Yogo critical value	16.38	16.38	16.38	16.38	16.38	

Table 2 (continued)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	2SLS	2SLS	2SLS	2SLS	2SLS	OLS
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)
Testing of endogeneity						
Durbin χ^2	66.97***	67.36***	87.18***	41.68***	40.96***	
Wu–Hausman F	67.00***	67.39***	87.25***	41.68***	40.95***	

Data rounded up

First-stage of main results is reported in Table 5 of 'Appendix 1'

Country-dummies are not shown

Significance level: *$p<0.05$; **$p<0.01$; ***$p<0.001$

wealth and expenditures both have a significant positive effect in Model 4, suggesting that they are independent precursors of welfare.

Finally, a set of household level covariates was added in Model 5. This is our main model, which incorporates all covariates. As shown, the effect of community trust remains positive and significant, and therefore lends further support to Hypothesis 1. As expected, a higher proportion of adults lives in a household is associated with higher welfare. The influence of the other characteristics is the same as in the previous models.

For comparison purposes, we re-estimated our main Model 5 using OLS. Results of OLS reported in Model 6 suggest that higher levels of community trust are associated with higher welfare, even when the IV approach has not been employed. However, a comparison between OLS and IV suggests that OLS considerably (approximately by ten times) underestimates the effect of trust on welfare. The magnitude of the underestimation is comparable to that reported in previous studies that used OLS and IV on the effects of community level trust (Kim et al. 2011; Habibov et al. 2017a, b). Such an underestimation is likely to originate in problems with endogeneity that OLS has failed to address.

To further control for possible regional variation, we estimate IV regressions separately for the countries of the former Soviet Union and the rest of the post-communist countries. The results of the main stage of IV models for FSU and non-FSU samples are presented in Models 7 and 6 of Table 3, while the results of the first-stage are available in Table 7 in 'Appendix 1'. As shown, community social trust has a positive effect on welfare in both regions.

4.2 Robustness Analysis

We conduct a robustness analysis by testing the robustness of our main Model 5 against: (1) alternative sets of covariates instead of the country dummies, (2) a control for individual level trust, (3) an alternative definition of community trust. The purpose of robustness analysis is to establish whether the direction and significance of the community trust effect on welfare will change due to alternative sets of covariates, control for individual level trust, and an alternative definition of trust.

We begin by re-estimating our main Model 5 by dropping country-dummies and instead using a wide range of country-level aggregated controls, namely, GDP annual growth, the GDP per capita, the Human Development Index, poverty and inequality rates, and the amount of social transfers to the population as a share of GDP (Habibov et al. 2017a). Since these control variables could potentially be correlated to each other, we conducted a separate estimation for each of them.

The results are reported in Model 9–13 of Table 4. As shown, the results demonstrate a positive effect of community trust on welfare, and hence support Hypothesis 1. At the same time, it must be that highlighted these models should be considered as robustness analysis models as compared to the main results in Model 5 with country-dummies. The reason is that reducing differences across countries to easily observed characteristics such as GDP per capita and GDP growth artificially reduces the true effects of community trust (Habibov et al. 2017a). For instance, the understanding of concepts such as "trust", "poverty, and "wealth" is likely to differ across countries. Other unobserved differences across countries include differences in the specifics of the design social welfare programs (e.g. accessibility, amounts of benefits, coverage, and stigma). Consequently, such unobserved

Table 3 Results for FSU and non-FSU samples separately

Variables	Model 7(FSU countries)	Model 8 (non-FSU countries)
	2SLS	2SLS
	Coefficient	Coefficient
	(SE)	(SE)
Community trust	12.679**	2.928**
	(4.049)	(0.922)
Female	0.023	−0.002
	(0.067)	(0.024)
Age: 25–34	−0.078	−0.157**
	(0.127)	(0.052)
Age: 35–44	−0.469***	−0.376***
	(0.136)	(0.052)
Age: 45–54	−0.563***	−0.503***
	(0.131)	(0.050)
Age: 55–64	−0.756***	−0.573***
	(0.144)	(0.051)
Age: 65+	−0.335*	−0.361***
	(0.161)	(0.064)
Married	0.410***	0.212***
	(0.097)	(0.028)
University educated	0.087	0.393***
	(0.083)	(0.031)
Unemployed	−0.056	−0.286***
	(0.086)	(0.031)
Wealth tertiles	0.378***	0.439***
	(0.046)	(0.021)
Expenditure tertiles	0.291***	0.234***
	(0.057)	(0.014)
Proportion of younger children	−0.109	−0.093
	(0.257)	(0.119)
Proportion of older children	0.511*	−0.198*
	(0.252)	(0.095)
Proportion of adult women	0.264***	−0.012
	(0.080)	(0.025)
Proportion of adult men	0.569**	0.021
	(0.215)	(0.057)
Proportion of pensioners	0.067**	−0.008
	(0.025)	(0.006)
Year 2016	1.211***	0.407***
	(0.337)	(0.036)
N	15,561	23,847
Wald test for equality of coefficients in the model	418.56***	4986.11***

Table 3 (continued)

Variables	Model 7(FSU countries)	Model 8 (non-FSU countries)
	2SLS	2SLS
	Coefficient	Coefficient
	(SE)	(SE)
Testing instrument relevancy		
First stage F statistics	20.15***	41.54***
Minimum eigenvalue statistics	20.15	41.54
Stock and Yogo critical value	16.38	16.38
Testing of endogeneity		
Durbin χ^2	51.35***	7.50**
Wu-Hausman *F*	51.42	7.50**

Data rounded up

Country-dummies are not shown

First-stage of regional results is reported in Table 6 of 'Appendix 1'

Significance level: *$p < 0.05$; ** $p < 0.01$; ***$p < 0.001$

differences are better captured by country dummies rather than by a very few available aggregated country level indicators.

We continue by re-estimating our main Model 5 by adding individual level trust as a control. It must be noted that while we have chosen to add individual level trust into the model, we are not trying to compare the direction and value of the effect on the individual and community levels. The reason is that individual and community levels of trust are likely to be strongly correlated, and our IV model has addressed the endogeneity of community trust, but not the endogeneity of individual trust (Habibov et al. 2017b). Thus, the purpose of our analysis is to test whether the direction and significance of community trust changed as a result of adding individual trust as a control. The results are reported in Model 14. After controlling for individual trust, the effects of community trust on poverty remain positive and significant.

The last step is to re-estimate our main Model 5 with an alternative definition of community trust. We use the LITS question that asked respondents, "Suppose you lost your (purse/wallet) containing your address details, and it was found in the street by someone living in this neighborhood. How likely is it that it would be returned to you with nothing missing?". Responses vary on the scale from 1 (not likely at all) to 5 (very likely), which we use as a continuous measure averaged at the community level. The results of the estimation with an alternative definition of community trust are reported in Model 15 of Table 4. As shown, higher levels of community trust have a positive and significant effect on increasing welfare, and therefore support Hypothesis 1.

Overall, we can conclude that the results of our sensitivity analysis confirm the direction and significance of the community trust effect on self-rated welfare. The positive and significant effect of community trust does not change as a result of alternative sets of control variables, an alternative definition of trust, and controlling for individual trust.

Table 4 Results with an alternative set of covariates instead of country dummies, individual level of trust, and alternative definition of community trust

Variables	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)
Community trust	7.714***	7.980***	5.858***	5.317***	7.581***	6.063***	
	(0.618)	(0.627)	(0.552)	(0.454)	(1.180)		
GDP annual growth (%)	0.013*						
	(0.006)						
GDP per capita	0.000***						
	(0.000)						
Human Development Index[a]		5.536***					
		(0.820)					
Poverty rate			−0.035***				
			(0.011)				
Gini				−0.019***			
				(0.003)			
Social transfers as share of GDP[b]					−0.255*		
					(0.849)		
Individual level trust (a control for individual level of trust)						−2.377***	
						(0.662)	
Wallet lost in the community will be returned (an alternative definition of community trust)							2.356***
							(0.417)
Year 2016	0.669***	0.903***	0.714***	0.545***	8.367	0.600***	−0.135
	(0.150)	(0.162)	(0.130)	(0.072)	(24.263)	(0.082)	(0.080)
N	39,408	37,837	39,408	39,408	31,286	27,117	39,486
Wald test for equality of coefficients in the model	2776.18***	2585.83***	6373.63***	6368.32***	3770.19***	6150.92***	9294.53***

Table 4 (continued)

Variables	Model 9 Coefficient (SE)	Model 10 Coefficient (SE)	Model 11 Coefficient (SE)	Model 12 Coefficient (SE)	Model 13 Coefficient (SE)	Model 14 Coefficient (SE)	Model 15 Coefficient (SE)
Testing instrument relevancy							
First-stage F-statistics	66.35***	70.79***	54.82***	67.92***	37.10***	53.91***	122.85***
Minimum eigenvalue statistics	66.35	70.79	54.82	67.92	37.10***	53.91	122.85
Stock and Yogo critical value	16.38	16.38	16.38	16.38	16.38	16.38	16.38
Testing of endogeneity							
Durbin χ^2	152.36***	167.94***	17.13***	22.18***	39.56***	23.00***	31.06***
Wu–Hausman F	152.69***	168.37***	17.13***	22.18***	39.58***	22.99***	31.05***

Data rounded up

Full results of the main stage for robustness analysis are in 'Appendix 1'

All estimations used the same set of control variables as in Model 5

Significance level: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

[a]Human Development Index is not available for Macedonia

[b]Social transfers as share of GDP is not available for Azerbaijan, Kyrgyzstan, Macedonia, Mongolia, Serbia, Tajikistan and Uzbekistan

4.3 Study Limitations

Our study had several key limitations. First, measures of subjective wellbeing and community social trust were not validated across countries. Hence, cross-country differences in associations between these measures may be due to regional cross-cultural variations or varying levels of socio-economic development leading to bias in our estimations. However, such biases should have been reduced through our inclusion of country dummies and country-level aggregates of socio-economic development. Second, the presence of a direct effect of an instrumental variable on the outcome variable represents another potential source of bias. Although we found no evidence for direct effects of the instrumental variable on the outcome variable, such effects cannot be completely ruled out. Third, there may have been some non-respondent bias in the survey. However, since our main results were relatively robust across country sets and time sets, survey non-response is not likely to lead to bias in our estimations. Finally, the small survey sample for individual countries prevents us from conducting any country-by-country analysis.

5 Conclusion and Implications

In light of the relatively limited research that has examined the impact of community trust on subjective poverty. We assess the association between community trust and welfare. In our theoretical framework, our hypothesis centered around several main mechanisms that could help translate higher levels of community trust into higher welfare on a diverse sample of post-communist countries over the span of 5 years.

In line with our theoretical argument, we found that increases in community trust lead to reductions in poverty. Using the instrumental variable approach increases our confidence that this finding is not the result of an endogeneity that has been caused by reverse causality, the unobserved variable effect, and measurement error. Using country dummies and a dummy for the year allows us to further reduce the potential bias associated with country-level and time variant unobserved factors. Our findings are also robust to an alternative measure of community trust and to control for individual level trust. Lastly, the richness of the data allows us to control for a number of alternative household and country-level explanations for variation in welfare.

The well-known positive outcomes of community social trust such as creating new employment opportunities, higher support for public welfare, healthcare, and education, better developed democratic administration, and more effective institutions, are commonly thought to facilitate poverty reduction. Although these positive outcomes of higher levels of community trust are often discussed in the literature, it has been a concern that they had never previously been tested and empirically confirmed. Thus, the theoretical contribution of this paper is that this research has empirically proven that which had previously only been assumed, namely, that community social trust has a positive association with reducing poverty. Importantly, we found a significant positive effect of trust on household welfare in post-communist countries where trust is typically lower, and poverty is more widespread that in developed Western democracies.

Our results also suggest that the gains that would occur in reducing poverty by increasing community trust would be considerable. Our results indicate that endogeneity is not a nuance of statistical estimation. If not properly taken into account, endogeneity is likely to misrepresent the true effect of community trust on poverty reduction. As an illustration, the significant underestimation of the true effect of community trust on self-rated welfare in post-communist countries in our case, may lead decision-makers, public service administrators, and international donors to neglect the importance of community social trust. As such, the underestimation of the true role of community trust in poverty reduction may convince decision-makers, public service administrators, and international donors to dismiss interventions that are aimed at building social trust.

Our results offer important insight into poverty reduction efforts in post-communist countries. Inasmuch as community trust is a key element of poverty reduction, poverty reduction will be more effective in the context of higher levels of community trust. Fortunately, multiple recent studies highlight the value of several strategies for building social capital in purposefully generating and maintaining social trust (Pronyk et al. 2008; Ogden et al. 2014). A systematic review of interventions aimed at promoting social trust can be found in King et al. (2010). Thus, it seems that there are strategies to generate and maintain community social trust can be employed in post-communist countries for the purposes of poverty reduction.

Appendix 1

See Tables 5, 6 and 7.

Table 5 First stage of 2SLS regressions for main results

Variables	Model 1 Coeff (SE)	Model 2 Coeff (SE)	Model 3 Coeff (SE)	Model 4 Coeff (SE)	Model 5 Coeff (SE)
Community length of residency	0.040***	0.047***	0.049***	0.030***	0.030***
	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)
Female		−0.001	−0.001	0.003	0.003
		(0.002)	(0.002)	(0.003)	(0.003)
Age: 25–34		−0.011*	−0.011*	−0.010	−0.010
		(0.005)	(0.005)	(0.006)	(0.006)
Age: 35–44		0.009	0.009	0.007	0.007
		(0.005)	(0.005)	(0.006)	(0.006)
Age: 45–54		0.007	0.006	0.003	0.003
		(0.005)	(0.005)	(0.006)	(0.006)
Age: 55–64		0.010	0.009	0.012	0.011
		(0.005)	(0.005)	(0.006)	(0.006)
Age: 65+		0.015**	0.014**	0.014*	0.006
		(0.005)	(0.005)	(0.006)	(0.009)
Married		0.003	0.003	0.002	0.002
		(0.002)	(0.003)	(0.003)	(0.003)
University educated		0.007*	0.008**	0.010**	0.010**
		(0.003)	(0.003)	(0.004)	(0.004)
Unemployed		−0.010***	−0.011***	−0.013***	−0.013***
		(0.003)	(0.003)	(0.003)	(0.003)
Wealth tertiles			−0.002	0.002	0.003
			(0.002)	(0.002)	(0.002)
Expenditure tertiles				−0.002	−0.002
				(0.002)	(0.002)
Proportion of younger children					−0.061**
					(0.022)
Proportion of older children					−0.059**
					(0.021)
Proportion of adult women					−0.056**
					(0.020)
Proportion of adult men					−0.058**
					(0.020)
Proportion of pensioners					−0.046*
					(0.021)
Year 2016	−0.044***	−0.043***	−0.046***	−0.040***	−0.042***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
F-statistics	452.35***	294.29***	282.39***	185.62***	164.77***
N	70,702.000	61,957.000	60,549.000	39,714.000	39,714.000

Data rounded up

Country-dummies are not shown

Significance level: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 6 First stage of 2SLS regression for regional results

Variables	Model 7 Coeff (SE)	Model 8 Coeff (SE)
Community length of residency	0.026**	0.046***
	(0.009)	(0.007)
Female	−0.001	0.005
	(0.005)	(0.004)
Age: 25–34	−0.008	−0.008
	(0.009)	(0.008)
Age: 35–44	0.012	0.009
	(0.009)	(0.009)
Age: 45–54	0.010	0.001
	(0.009)	(0.008)
Age: 55–64	0.018	0.009
	(0.009)	(0.008)
Age: 65+	0.000	0.013
	(0.014)	(0.013)
Married	−0.013**	0.011**
	(0.005)	(0.004)
University educated	0.013*	0.012*
	(0.005)	(0.005)
Unemployed	−0.011*	−0.013**
	(0.005)	(0.005)
Wealth tertiles	−0.004	0.010***
	(0.003)	(0.003)
Expenditure tertiles	−0.010***	0.003
	(0.003)	(0.002)
Proportion of younger children	−0.125***	0.061
	(0.029)	(0.037)
Proportion of older children	−0.157***	0.078*
	(0.027)	(0.036)
Proportion of adult women	−0.169***	0.102**
	(0.025)	(0.034)
Proportion of adult men	−0.175***	0.104**
	(0.025)	(0.034)
Proportion of pensioners	−0.150***	0.106**
	(0.027)	(0.034)
Year 2016	−0.095***	−0.006
	(0.005)	(0.004)
F-statistics	154.21***	95.39***
N	15,682.000	24,032.000

Data rounded up

Country-dummies are not shown

Significance level: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 7 First stage of 2SLS regression for robustness analysis

Variables	Model 9 Coeff	Model 10 Coeff	Model 11 Coeff	Model 12 Coeff	Model 13 Coeff	Model 14 Coeff	Model 15 Coeff
	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)
Community length of residency	0.029***	0.028***	0.021***	0.031***	0.001*	0.029***	0.091***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.010)
GDP annual growth (%)	0.001**						
	(0.000)						
GDP per capita	−0.000						
	(0.000)						
Human Development Index[a]		−0.167***					
		(0.027)					
Poverty rate			−0.004***				
			(0.000)				
Gini				−0.000			
				(0.000)			
Social transfers as share of GDP[b]					0.003***		
					(0.000)		
Individual level trust						0.313***	
						(0.402)	
Year 2016	−0.056***	−0.054***	−0.054***	−0.049***	−0.079***	−0.031***	0.189***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)
Female	0.003	0.002	0.001	0.003	0.006	0.003	−0.009
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)
Age: 25–34	−0.014*	−0.010	−0.020**	−0.014*	−0.009	0.000	−0.022*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.006)	(0.011)
Age: 35–44	0.002	0.005	−0.008	0.001	0.007	0.014*	−0.007
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.006)	(0.011)

Table 7 (continued)

Variables	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)	(SE)
Age: 45–54	−0.004	−0.002	−0.009	−0.005	−0.003	0.009	0.026*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.006)	(0.011)
Age: 55–64	0.001	0.002	−0.004	0.000	0.005	0.012*	0.020
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.006)	(0.011)
Age: 65+	−0.002	−0.002	−0.009	−0.003	0.005	0.008	0.001
	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.009)	(0.016)
Married	0.005	0.005	0.007*	0.005	0.004	−0.005	0.023***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)
University educated	0.031***	0.028***	0.027***	0.030***	0.034***	−0.003	0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.006)
Unemployed	−0.027***	−0.028***	−0.021***	−0.026***	−0.033***	−0.002	0.004
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.006)
Wealth tertiles	−0.001	−0.004	−0.000	−0.001	0.002	−0.003	−0.007
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.004)
Expenditure tertiles	−0.005*	−0.004*	−0.004*	−0.005*	−0.005*	−0.001	−0.012***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Proportion of younger children	−0.058*	−0.046	−0.086***	−0.059*	0.037	−0.032	−0.057
	(0.024)	(0.024)	(0.024)	(0.024)	(0.030)	(0.022)	(0.039)
Proportion of older children	−0.076***	−0.071**	−0.089***	−0.075***	0.036	−0.034	−0.083*
	(0.023)	(0.023)	(0.023)	(0.023)	(0.029)	(0.021)	(0.037)
Proportion of adult women	−0.083***	−0.067**	−0.122***	−0.083***	0.067*	−0.039*	−0.164***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.027)	(0.019)	(0.034)
Proportion of adult men	−0.084***	−0.067**	−0.121***	−0.084***	0.065*	−0.036	−0.120***

Table 7 (continued)

Variables	Model 9		Model 10		Model 11		Model 12		Model 13		Model 14		Model 15	
	Coeff		Coeff		Coeff		Coeff		Coeff		Coeff		Coeff	
	(SE)		(SE)		(SE)		(SE)		(SE)		(SE)		(SE)	
	(0.021)		(0.021)		(0.021)		(0.021)		(0.027)		(0.019)		(0.034)	
Proportion of pensioners	−0.079*****		−0.062**		−0.115***		−0.080*****		0.069*		−0.033		−0.123*****	
	(0.022)		(0.022)		(0.022)		(0.022)		(0.028)		(0.020)		(0.036)	
F-statistics	24.64***		33.05***		48.43***		25.42***		42.73***		465.76***		311.59***	
R-squared	0.01		0.02		0.02		0.01		0.03		0.43		0.26	
N	39,714.000		38,141.000		39,714.000		39,714.000		31,560.000		27,306.000		39,793.000	

Data rounded up

Country-dummies are not shown

Significance level: $*p < 0.05$; $**p < 0.01$; $***p < 0.001$

[a]Human Development Index is not available for Macedonia

[b]Social transfers as share of GDP is not available for Azerbaijan, Kyrgyzstan, Macedonia, Mongolia, Serbia, Tajikistan and Uzbekistan

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