

# Elderly Volunteering and Well-Being in Europe. Revisiting Haski (2009) \*

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Volunteering changes with age not only in its popularity but also in its characteristics. The motives are also presumably different (Wilson (2012) dodac inne). From an economic perspective one may distinguish demand for volunteering that is created by unmet demand for public goods and services and supply of volunteering that depends on how a person allocates her or his time to unpaid activities to improve her utility Ziemek (2006). Economic reasoning suggests that volunteering should be related to unsatisfactory level of supply of public good and services that are not delivered by either the market or the government. This implies that unpaid work at the form of volunteering should be more popular in less developed countries where markets are inefficient and quality of government is low. However, this prediction is false and volunteering is rather positively related to the degree of economic development (Oecd (2015)). Participation rates in formal volunteering range from 57.3% in Norway to 17.7% in Czechia. If concentrate on people aged 50 and over in Europe variation in the rates is even larger. It ranges from 37.9% in the Netherlands to as little as 3.2% in Poland (Oecd (2015))<sup>1</sup>

Higher rates of volunteering in highly developed countries suggests a considerable role of supply factors and the role of public policy in overcoming the barriers to volunteering such as transport difficulties, lack of information, perceptions of volunteering and lack of variety in the opportunities. In the times of rising the problem of ageing volunteering among elderly can play important role in sustaining well-being of elderly. Volunteering is beneficial for society (Oecd (2015), Prouteau and Wolff (2006), japonka). Often it is treated as a productive activity (Hank and Erlinghagen (2009)). But it also benefits volunteers. Jenkinson et al. (2013) surveyed forty experimental and cohort studies comparing the physical and mental health outcomes and mortality of a volunteering group to a non-volunteering group and they found that volunteering had favourable effects on depression, life satisfaction, wellbeing but not on physical health. Positive association between volunteering and subjective health was reported in many studies (e.g. Borgonovi (2008), (Anderson et al. (2014), Li and Ferraro (2006), Van Willigen (2000), Detollenaere et al. (2017)).

Quality of life of elderly has become a major social issue. Elderly are likely to experience negative events due to health deterioration, reduction of income and smaller social contact network. Volunteering may improve their QoL through engagement in a socially meaningful role. Volunteering builds up social networks and gives meaning and purpose in life. The positive consequences of being engaged in volunteering by elderly are well known and commonly accepted. Demographic changes combined with progress in health care add to increasing time while people are in relatively good health while being on retirement. This creates additional stock of unused labor

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<sup>1</sup>Fig 5.8 Participation rates in formal volunteering among people aged 50 and over in European countries, data are based on the Survey of Health, Ageing and Retirement in Europe (SHARE), wave 4(2015)

among elderly that may be effectively used with benefit for volunteer and other members of a society. It makes volunteering of elderly to be potentially important policy tool that may help to keep people in better health when they get older.

The positive effect of volunteering has been recognized by many international organizations. In its 2001 recommendations on support for volunteering, the United Nations General Assembly identified volunteering as “an important component of any strategy aimed at . . . poverty reduction, sustainable development, health, disaster prevention and management and . . . overcoming social exclusion and discrimination” (United Nations, 2001). In 2008, the European Parliament spoke of volunteering as “[the] most sustainable form of renewable energy” and encouraged Member States and regional and local authorities to “recognise [its] value . . . in promoting social and economic cohesion” (European Parliament, 2008). The year 2011 was declared the European Year of Volunteering by the European Commission (OECD, p.202). Volunteering by elderly is important and we are expecting that it will be even more important in near future. We believe that the relation between volunteering and QoL should be studied.

The assessment of elderly QoL is challenging. The concept of QoL may have a different meaning for different people depending on the choice of the most important domains of it. That choice can be deeply rooted in cultural and religious factors. Discussion of issues related to the definition of wellbeing among elderly can be found for example in National Research Council (US) (2001). One of proposed measure of QoL for elderly is the CASP-19. It is based on the needs-satisfaction theory (Maslow, 1943; Doyal and Gough, 1991). This scale includes 19 Likert-type items reflecting four different dimensions of QoL: Control, Autonomy, Self-realization, and Pleasure. A shorter version with 12 items, the so-called CASP-12, was proposed and tested in (Wiggins et al., 2008). A 12-item version of the CASP used in the Survey of Health, Ageing and Retirement in Europe (SHARE) differs from the one suggested in Wiggins(2008). A SPAIN paper supports a multidimensional model for the CASP-12 composed by three factors and it concludes has potential to be used as a multidimensional tool to assess QoL in older people.

It is commonly agreed in the literature that helping others positive effects wellbeing of volunteering. Those engaged in such activity report better health and higher scores for subjective well-being (Haski-Leventhal (2009), Morrow-Howell et al. (2003), (Thoits and Hewitt 2001), (Whillans et al. 2016)). (Meier and Stutzer 2008b) showed that volunteering led to increased life satisfaction in a longitudinal study in Germany. One may also expect positive relation between volunteering and quality of life. In his review essay on volunteerism research Wilson (2012) listed the benefits of volunteering for the volunteer. The list included: enhancement in mental health and protection against symptoms of mental illness, lower levels of morbidity and mortality, socioeconomic benefits such as increase in chances of obtaining a better education and a better job. Positive effect of volunteering was also found in a study based on 30 case studies from 11 European countries (Ehlers et al. (2011)). It was stressed that volunteering of elderly people help them to build new relationships with other volunteers but also with those whom they helped. According to findings presented in the study volunteering helps regain a meaningful activities after some adverse events.

A question about volunteering effect on QoL is asked surprisingly rarely. Haski-Leventhal (2009) is an exceptional example of an empirical study in this field. The study was based on data collected in 2005 and 2006 in the first wave of Survey of Health, Ageing and Retirement in Europe (SHARE). It included an extensive discussion of variations in volunteering rates according to main socio-economic variables as age, gender and employment status among people aged 50 or more in 12 Western and Southern European countries. It found the highest rates of volunteering among elderly in Northern Europe and the lowest rates in Southern Europe. Also, a positive relation between volunteering and physical and psychological well-being was identified. All those results confirmed findings known from the previous research. The new and rather unexpected result was on a relation between volunteering and wellbeing. It was found that *“in countries which encourage volunteerism and where volunteering is a social norm, such as in the Northern European countries, the relation of volunteering and wellbeing was rather small. At the same in countries where volunteering was not so popular a*

*correlation between volunteering and three indicators of well-being (health, depression, and chances for longer life) were rather strong.”.*

This paper follows the discussion proposed in that study. We extend it in a few directions. Firstly, we use more current data collected in 2015 in the sixth wave of the SHARE survey. This not only allow to compare changes in time but also opens a possibility to include new countries into the analysis since some Central and Eastern European countries (CEE) that did not participated in the first wave of the SHARE survey were included in the wave 6 of it. This is important extension since as it was noted in (Casiday et al. 2008) the majority of the papers on volunteering are based on data from the United States. The studies on volunteering among elderly from the CEE are rare (LIT. Sokolowski 2001). This is very unfortunate since remarkable different life course of those people from lives of Western Europeans may lead to new insights on volunteering of people 50+. Secondly, in the first wave of the SHARE survey volunteering had to be identified by a question on activities conducted during last 4 weeks preceeding the interview. This is rather unusuall measure since more often the period of 12 months is used in such questions (CHECK, LIT). This may explain why the rates of volunteering obtained from the wave 1 differed significantly to other sources. As we show below replacing 4 weeks span time by 12 month period has resulted in the rates much closer to those published from the other datasets. Third, association between volunteering and health or life satisfaction is measured in the paper by the Kendall tau coefficient while Haski-Leventhal (2009) used the Pearson correlations. Also, we test the statistical significance of differences in the correlations coefficients between countries what was not done in the mentioned paper. Since the differences are often small it is not obvious if a given difference is really meaningfull. As it was mentioned earlier we apply the CASP measure of quality of life that was not used in the reference paper. Finally, we use a regresion analysis to control for possible confounders in the relatin between popularity of volunteering amog elderly and its impact on QoL. We are interested in two hypothesis:

1. H1: volunteering differently influences QoL in different countries
2. H2: How important the volunteering is depends on its popularity. Its impact is either decreasing when the rate of volunteering increases or the relation is convex (inverted U).

The second hypothesis reveals our conviction that the current state of our knowledge on volunteering among elderly requires to treat the relation between the popularity of volunteering and its impact on QoL as the empirical question. Answering this question have important practical consequences. Population aging in Europe asks for new policy tools to keep elderly wellbeing on decent levels. Volunteerism is an interesting option for productive ageing.

## 1 Data

We use data from the wave 6 of the Survey of Health, Ageing and Retirement in Europe (SHARE). The dataset provides wide range of information on the socio-economic status, health, and family relationships of people in age 50 or more in 18 European countries. The dataset includes information from 68 231 interviews (CAPI) conducted in 2015 in 18 countries - 11 countries were included in the wave 1 (Austria, Belgium, Denmark, France, Germany, Greece, Israel, Italy, Spain, Sweden, Switzerland) and 9 countries that entered the survey later on (Czech Republic, Poland, Luxemburg, Portugal, Slovenia, Estonia and Croatia). SHARE applies a concept of ex-ante harmonisation: there is one common generic questionnaire that is translated into the national languages using an internet based translation tool and processed automatically in a common CAPI instrument. In each participating country a probability sample was drawn. Due to different institutional conditions a uniform sampling design was impossible. For example, a simple random selection of households, from the central population register was used in in Denmark, while complex multistage design was applied in Greece. The household level response rate ranged from 30.3% in Luxemburg to 69.3% in Greece. Bergmann et al. (2017)

Volunteering in the study is identified using respondent's answers to a question about activities done in 12 months preceding the survey. We consider as a volunteer a person who gave a positive answer to a question: "Have you done any of these activities in the last month: Done voluntary or charity work." This definition of the volunteering is consistent with the UN definition <sup>2</sup>. Volunteering considered here does not include a help given to close family members. We consider in the paper the formal volunteering that is conducted within a formal organisational structure, is self-governing, is not profit distributing and is independent of government. We do not consider the informal volunteering such as providing unpaid help to a friend or neighbour. We are aware that our approach is not free of a measurement error. The lengthy and detailed discussion of challenges to measuring volunteering can be find in Salamon et al. (2017). Our approach is exactly the same as in Haski-Leventhal (2009) and ?.

Below we comapare the rates of volunteering reported in Haski-Leventhal (2009) with the rates published in ? calculated from the wave 4 and 5 of the SHARE and the rates obtained by us with the wave 6.

**Table 1: Volunteering rates**

	(1)		
	age50pshare1	age50pshare6	age50p
AT	8.482871	20.14157	27.11111
BE	15.55375	26.6472	26.125
DK	17.68369	31.42221	23.88889
FR	14.23717	22.86863	28.33333
DE	10.77763	23.85213	25.44444
GR	3.101644	7.022412	4.625
IS	11.9421	15.53073	21.66667
IT	6.738869	11.82818	16.66667
NL	21.89474	.	37.375
SE	2.448454	6.268717	14
S	18.00267	14.65221	12.77778
CH	14.4958	29.53292	31.8
CZ	.	8.876772	12.125
PL	.	3.428239	9.222222
IR	.	.	36.88889
LU	.	24.74916	29.28571
HU	.	.	7.375
PT	.	9.552845	10.11111
SL	.	12.15442	30.25
EE	.	8.756568	14
Total	12.11328	16.31088	20.95359
N	20		

The rates obtained from the wave 1 are noticable lower than others. The rates from the wave 6 exceeds those from the wave 1 except Sweden (18% vs. 15%). For example, for Switzerland the rate is almost 30%, while previously it was 15%. For Germany the rate changed from 17% to almost 25%. The rates in countries that did not participated in the wave 1 are low - Poland 3.4%, Czech Republic 8.9%, Estonia 8.7%, Portugal 9.5%, Slovenia 12.1%. Only for Luxemburg the rate is high - 24.7%. As in the previous studies, there is a significant country variation in volunteering rates in th wave 6 data. The pattern found in the SHARE data is well know in literature - the highest rates are in Northern and Western Europe: Denmark (31.4%), Switzerland (29.5%) and Belgium (26.6%), and the lowest rates are in Eastern and Southern Europe: Poland (3.4%), Spain (6.3%), Greece (7.0%) and Czech Republic (8.9%).

The low rates of formal volunteering observed in Southern and Eastern European countries may be partly due to tight family bonds in these countries and low welfare services. For example, elderly in Southern and Eastern European countries may more often take care of grandchildren what limits their possibility to be involved in formal volunteerig (Dykstra and Fokkema, 2011; Hank, 2007). It is intresting that volunteering in formerly centrally-planned economies such as Czech Rep., Estonia or Croatia are higher than in Southern Europe. We may speculate that an economic progress in Eastern and Central Europe that have been observed since the collapse of the communism is an one possible explanation.

<sup>2</sup>United Nations Volunteers Programme: Preparatory Committee for the Special Session of the General Assembly on the implementation of the outcome of the world summit for social development and further initiatives. Volunteering and social development. A/AC.253/16/Add.7. United Nations; 2000.

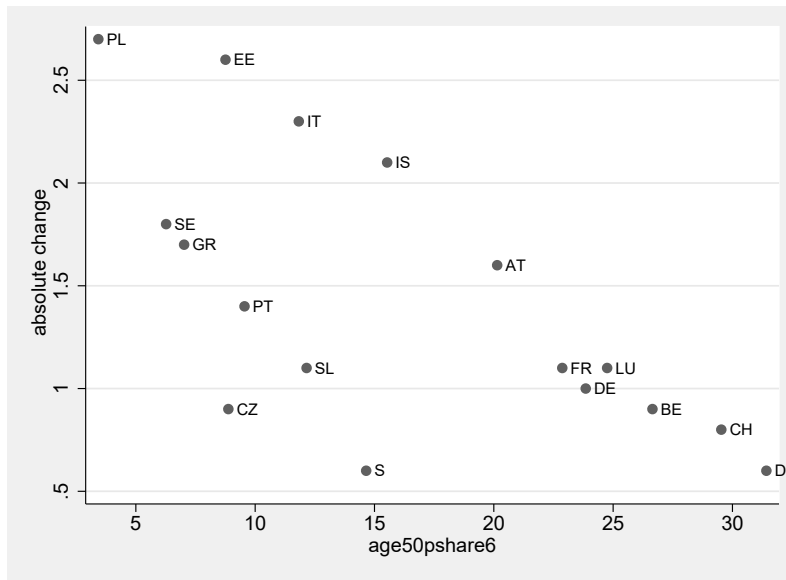
We use the CASP-12 index as a measure of QoL. The CASP-12 is a shorter version of the CASP-19 that was created as a measure of quality of life (QoL) in older ages. QoL using the CASP is assessed depending on the level of implementation needs in areas relevant to the positive experience of older age Hyde (2003): the possibility of influencing one's own needs in areas relevant to the positive experience of older age (Hyde et al., 2003): the possibility of influencing one's own surroundings (Control), autonomous decision-making (Autonomy), self-realization and taking pleasure in surroundings (Control), autonomous decision-making (Autonomy), self-realization and taking pleasure in life (Pleasure). The CASP-19 draws upon on the discussion of Maslow's theory of needs (1968)(Borrat-Besson et al. 2015). Maslow's theory was compared with the view presented in the article by Doyal and Gough (1991) that the priority of physiological needs over social may be dependent on circumstances. As an example we can consider elderly people saving on heating to buy Christmas presents for grandchildren. From Maslow, the authors of the CASP adapt an important view that people share a universal set of needs, which translates into measurable level of satisfaction of needs that is comarable for different people. The important feature of the CASP measure is its higher resistant to short-term factors such temporary mood or time of day than of life-satisfaction qustion (White, 2007.)

Table X compares average casp values for volunteers and non-volunteers in age 50+ from the wave 6 of the SHARE survey. In each country the value for volunteers is higher than for non-volunteers. All differences between the averages are statistically different from zero. The distributions of casp for volunteers and non-volunteers are given in the Appendix. In all countries declarations of volunteers are more concentrated among large values.

**Table 2: Casp**

	0	1	b	p
AT	40.746261	42.304745	-1.5584836	2.033e-12
BE	39.679801	40.553373	-.87357198	1.950e-07
DK	42.030572	42.552391	-.52181865	.00052022
FR	39.383067	40.455224	-1.0721573	7.245e-07
DE	40.010277	40.981818	-.9715415	3.858e-08
GR	33.224563	34.922481	-1.6979181	1.119e-07
IS	35.826884	37.928177	-2.1012929	1.228e-06
IT	36.379366	38.69181	-2.3124442	6.025e-18
ES	37.854395	39.69697	-1.8425749	2.627e-08
S	40.232082	40.777778	-.54569587	.01454333
CH	41.272021	42.127219	-.85519821	6.888e-06
CZ	36.521263	37.411079	-.88981543	.00102886
PL	38.20719	40.891304	-2.6841142	.00148375
LU	40.815981	41.875399	-1.0594187	.00028108
PT	35.387578	36.82	-1.4324224	.00403019
SL	39.702349	40.778555	-1.0762059	.00001613
EE	37.061064	39.706897	-2.6458327	8.952e-19

Conditonal means for casp for volunteers and non-volunteers reveal positive associaton between volunteering and QoL. Differences in the scores are smaller in high income countries. The absolute difference for Denmark is 0.9, for Switzerland 1.1 while for Greece 2.1, for Portugal 2.4 and for Isreal 2.9. The highest absolute difference of 3.8 is for Poland and the second to the highest if for Estonia (3.6). Negative relation between the country volunteering rate and its relation to average casp may be summerized as "more volunteers in a country makes smaller increase in volunteer wellbeing". Higher heterogeneity among low rate countries should be noticed. The rates in Czech Republic, Portugal and Estonia are similar but the differences in conditonal means are significant. Relatively small differences in Czech Republic and Slovenia make them close to the differences in much richer countries such as France, Germany, Luxemburg.



**Figure 1:** volunteering shares

Comment: heterogeneity or non-linearity

## 2 Results

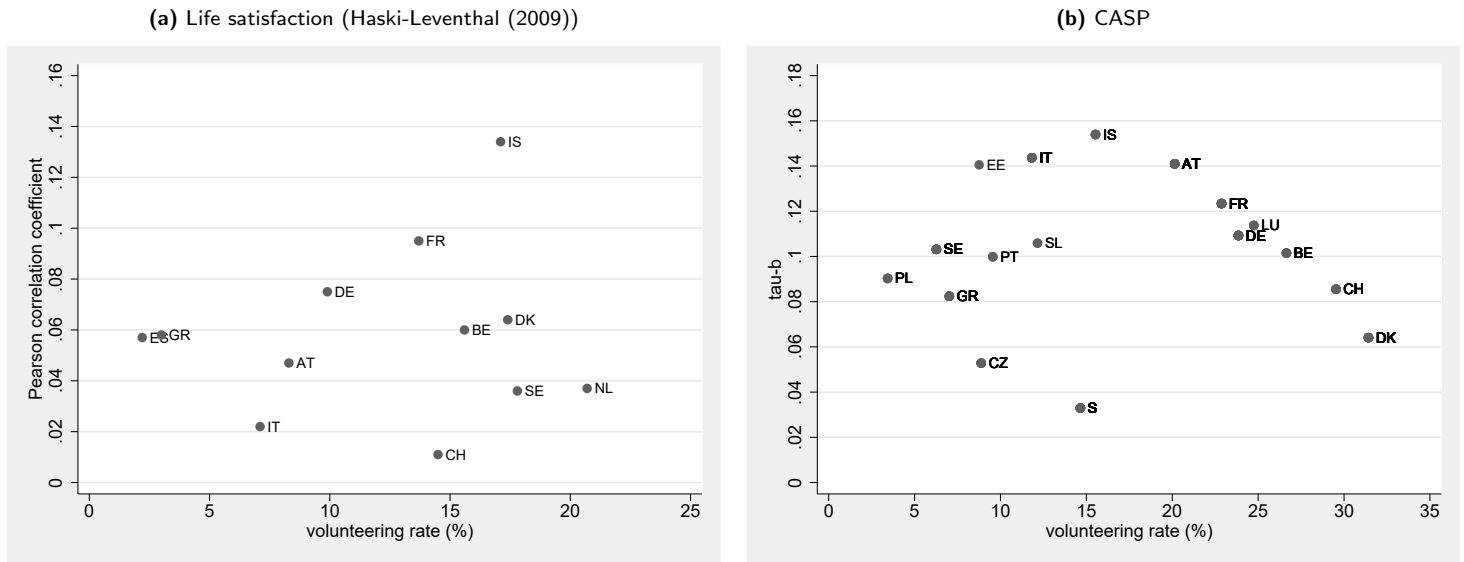
3

Haski-Leventhal (2009) analyzed association between volunteering and life satisfaction measuring it using the Pearson's correlation coefficient. Here we use this relation using casp index as a measure of QoL and Kendall's tau-b correlation coefficients as an association measure. We apply it since the Pearson correlation coefficient may be used only for interval data, while the Kendall's correlation coefficients can be used for either ordinal or interval data. According to Khamis () Kendall's tau is the appropriate measure if at least one variable is ordinal one <sup>4</sup>. Also, Kendall's tau is less sensitive to outliers. The Kendall's tau-b correlation coefficients together with the rates of volunteering are presented below. They are compared with the results in Haski-Leventhal (2009).

<sup>3</sup>based on PEARSON'S VERSUS SPEARMAN'S AND KENDALL'S CORRELATION COEFFICIENTS FOR CONTINUOUS DATA, Nian Shong Chok, 2008

<sup>4</sup>Khamis H. Measures of Association: How to Choose? Journal of Diagnostic Medical Sonography. 2008;24:155-162.

**Figure 2: Volunteering and wellbeing**



Notes: (a) wave 1 (2006-2007), (b) wave 6 (2015)

Source: Haski-Leventhal (2009) [Table 3] and own calculations based on SHARE Wave 6.

The Kendall's correlation coefficients range from 15.4% (Israel) to 3.3% (Sweden) showing positive association between volunteering and CASP. The inverted U-shaped relation is easily observed. The values for Germany and Belgium are similar to those in Slovenia, Portugal and Spain despite the difference in the rates of volunteering reaching 10 pp. At the same time the differences between Czech Republic on one side and in Italy and Estonia on another are highly significant (p-values about 1%) while the rates are similar. Those results confirm the unexpected pattern of correlations between popularity of volunteering and wellbeing identified in Haski-Leventhal (2009). As we see the more recent data from the SHARE survey with more countries, a different measure of volunteering and a different measure of association confirms that similar volunteering effect on QoL may exist in low rate countries (Czech Republic, Greece, Portugal, Slovenia) and in high rate countries (Denmark, Switzerland, Belgium, Luxembourg, Germany). The added result is quite strong suggestion on non-linearity between the rate of volunteering and the effect of it. The strongest impact should be expected in countries with the mid-range rates. This is not so clearly observed in Haski-Leventhal (2009).

Haski-Leventhal (2009) sees two possible explanations of no difference in relation between volunteering and wellbeing according to the rates of volunteering. The first explanation assumes different motives behind volunteering according to the economic development of a country. In countries where the welfare system is strong people volunteer not because there are real problems to be solved but because there is a such social norm. Lack of necessity is suggested explanation of the weak effect of volunteering. In countries where the welfare state is weak people involved in volunteering may feel the sense of fulfillment. The second explanation is based on the Social Origins Theory (Salamon and Anheier 1998) and it seems to be similar to the crowding out argument. This argument states that the state through its generous social welfare policy satisfies demand for most social needs efficiently constraining supply of volunteering by non-governmental organizations.

Both explanations rely on an economic development of a country. They help to understand why volunteering may have limited impact on wellbeing in rich countries. However, they do not tell us why the association is low in less developed countries. [more... country effect]

Also, neither the Pearson's correlation coefficients calculated in Haski-Leventhal (2009) nor the Kendall's correlation coefficients calculated by us do not control for confounding variables that may contaminate the relation between volunteering and well being. Descriptives statistics show that are significant differences in characteristics of volunteers and non-volunteers (Appendix - table). [Rewrite it] Volunteers are generally younger and better educated than non-volunteers. The age distributions conditional on volunteering for Austria, and Germany quite similar. In Greece, Poland, Slovenia and Estonia volunteers are concentrated among people below age of 60. In Belgium, Denmark, France, Israel, Italy, Spain, Switzerland and Luxembourg volunteers are concentrated more among those in the age range 60-70. To check the robustness of the relation to confounding variables we run a regression analysis.

## Volunteering and casp (regression analysis)

The relation between the rate of volunteering and its impact on wellbeing may be modelled under different assumptions. One possibility is to assume that the universal relation between volunteering and QoL conditional on the rate of volunteering. In this approach the country effect depends on observed variables and any deviation from conditional expected value is treated as a random event. So, the deviations from the grand average are assumed to be not related to country level variables included into the model.

### Fixed effect approach

Another approach assumes the unique relation for each country. Here, the country effect encompasses the differences in history, cultural factors and institutions that are seen as the unique characteristic of a country. Hence, the estimated effect for one country does not give us any extra information on the effect for another one. This approach does not allow for predicting changes in relation between volunteering and QoL using the predictions for other countries. This approach is equivalent to fitting separate models for each country:

$$casp_{i,c} = \beta_{0c} + \beta_{1c} * v_{i,c} + \gamma_c * Z_{i,c} + \epsilon_{i,c} \quad (1)$$

where  $v_{i,c}$  is a binary variable equal to 1 if a person  $i$  from a country  $c$  is involved in volunteering and a matrix  $Z_{i,c}$  includes the following controls : age, gender, education measured in years of formal education, a country average gdp per capita expressed in purchasing power parity in years X-Y and a equivalized household level income also in ppp units.

In the model  $\beta_{0c}$  controls for country-specific factors and  $\beta_{1c}$  describes impact of volunteering on QoL. For each country we get the separate coefficient while controlling for the general country effect  $\beta_{0c}$  and a set of confounders. No restrictions are assumed on the variance of the error terms for each country.

Almost all coefficients on the volunteering variable are positive at 10% or less significance levels. Luxembourg is the only estimate that does not allow us to reject the non-significance hypothesis. It confirms common finding about positive association between volunteering and QoL. The high point estimates can be found among the low rate countries such as: Greece, Italy, Spain, Israel, Poland, Estonia. The low point estimates are for: Luxembourg, Denmark, Belgium, Germany, Switzerland and Czech Republic.

Estimates on the control variables have expected signs. Better subjective health and higher income increase QoL. Estimates on age are positive in rich countries: Belgium, Denmark, Germany, Israel, Luxembourg. Negative values are in Austria, Greece, Spain, Sweden, Czech Rep., Portugal, Slovenia, Estonia. Female effect has differential directions but in more countries females report lower QoL. The positive effect is found in: Denmark, Sweden and Estonia. Education more often has positive effect but in Austria, Denmark, Sweden it lowers QoL.



### Random effect approach

An alternative approach to the analysis of a relation between volunteering and QoL is to assume that the common relation for all countries. Here we treat differences as a random deviation from the expected value. This leads to a multilevel linear regression model. Below we consider a model with a varying intercept for countries and varying coefficient for impact of volunteering on QoL. Random intercept for each country allows for different values of QoL within a country by gender, age and other control variables. At the same time we allow for a variation in mean QoL between countries. We make the volunteering parameter to depend on the rate of volunteering :

$$casp_{i,c} \sim N(\beta_0 + u_c + \beta_{1,c} * vol_{i,c} + \gamma * Z_{i,c}, \sigma_y^2) \quad (2)$$

$$\beta_{1,c} \sim N(\gamma_r * \ln(r_c), \sigma_r^2) \quad (3)$$

where  $r_c$  is a country volunteering rate calculated from the wave 6 of the SHARE survey.

### Decomposition - volunteering v characteristics

The within country difference in mean values in linear regression fixed effect model of QoL may be decomposed into the volunteering effect and the effect due to differences in characteristics (the endowment effect): <sup>5</sup>

$$E[casp_c | v_{i,c} = 1] - E[casp_c | v_{i,c} = 0] = \beta_{1c} + \gamma_c * [\bar{Z}_c(1) - \bar{Z}_c(0)] \quad (4)$$

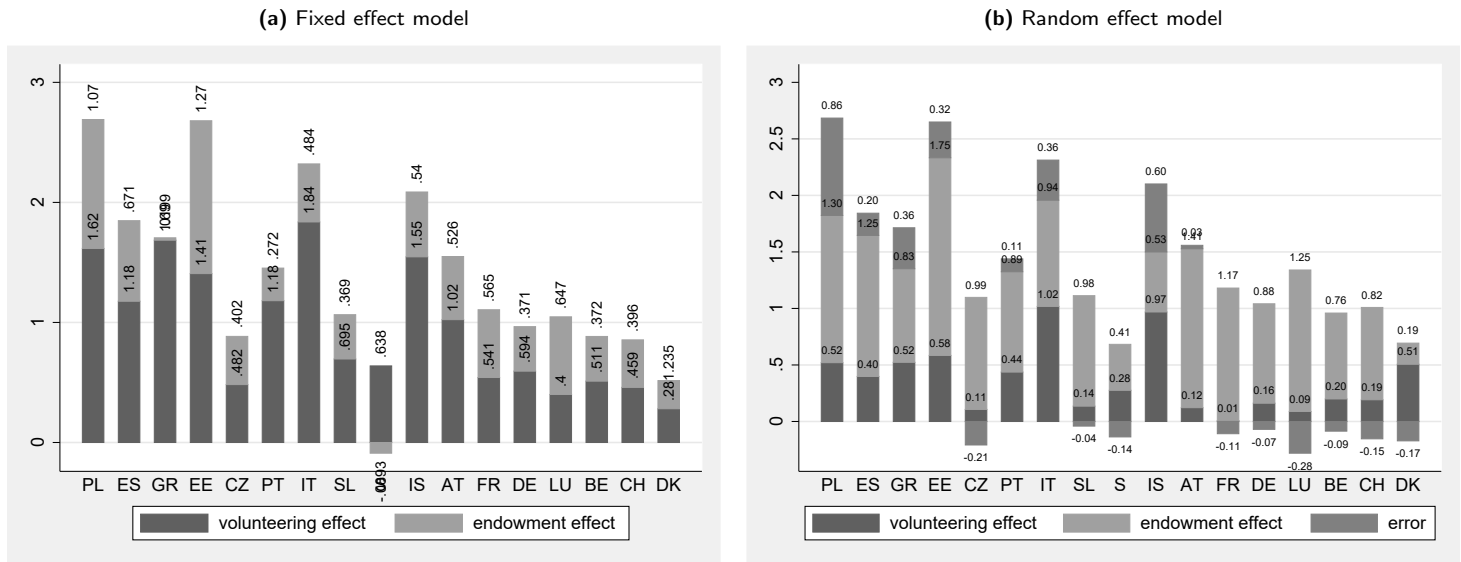
with  $\bar{casp}_c(1)$  being a predicted average QoL for a volunteer and  $\bar{casp}_c(0)$  being a predicted average QoL for a non-volunteer. The first term measures the volunteering effect for country  $c$ , the second term absorbs the effect of the difference in the values of covariates among volunteers and non volunteers (the endowment effect) with  $\bar{Z}_c(1)$  being average endowment among volunteers and  $\bar{Z}_c(0)$  among non-volunteers. The mean difference in QoL in the random effect approach can be decomposed as:

$$E[casp_c | v_{i,c} = 1] - E[casp_c | v_{i,c} = 0] = [\beta_1 + u_r(c)] + \gamma * (\bar{Z}_c(1) - \bar{Z}_c(0)) + [\bar{\epsilon}_{i,c}(1) - \bar{\epsilon}_{i,c}(0)] \quad (5)$$

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<sup>5</sup>It is possible since  $\bar{casp}_c = \bar{casp}_c$

**Figure 3: Volunteering and wellbeing (OLS)**



Notes:

Source: Own calculations based on SHARE Wave 6.

The volunteering effect is positive regardless the used approach. The results of both models are consistent with the previous finding on a weak relation between volunteering and QoL in highly developed countries. However, controlling for confounders reveals the stronger effect among countries with the low rates what was suggested by the Kendall's correlations. This decreasing relation between the popularity of volunteering and its impact on QoL is consistent with the two explanations given in the Haski-Leventhal (2009).

The models disagree in the importance of the effect among the low rate countries. The fixed effect model shows higher effect in those countries (Italy, Greece, Israel and Poland) than in the countries where the rates of volunteering are high (Denmark, Switzerland, Luxemburg, Sweden but also in Czech Rep.). The random effect model shows the highest impact of volunteering on QoL among the countries with the middle range of the volunteering rates (Italy and Israel). In countries where the rates are either low or high the impact is weaker. The random effect results are more similar to the previous one based on unconditional correlations.

#### Importance of selection

Controlling for covariates - age, gender, education, economic development of a country and household's income - decreases relative importance of volunteering. The fixed effect approach shows especially large effect of selection into volunteering in Poland and Estonia and relatively smaller in Italy, Greece, Spain, Portugal and Israel. It is interesting to notice that in two formerly communistic countries - Poland and Estonia - selection into volunteering is more important than in Southern Europe. It suggests that nowadays volunteering of elderly in CEE countries adds relatively less to average QoL than in Southern Europe. Volunteers in CEEs are more often selected from those who had high level of QoL even without the volunteering. It confirms consistent regional differences between some CEE countries (Poland and Estonia), Western Europe and South Europe.

A random effect approach shows different pattern of the volunteering effect but the pattern of selection into it seems to be similar. Here a role of the selection in Southern Europe is smaller than in Poland and Estonia, also.

### 3 Discussion

We applied three empirical approaches to discuss a relation between popularity of volunteering and its impact on individual QoL. We calculated the Kendall tau correlation coefficients and compared our conclusions with those discussed in Haski-Leventhal (2009). Then, we estimated a multivariate linear regression model for QoL in order to control for socio-economic confounding factors. We estimated the model using the fixed effect and the random effect estimators.

Both approaches showed higher QoL among volunteers than non-volunteers. The result holds even after controlling for socio-demographic characteristics such as age, education, gender and income. The multivariate approach showed that the unconditional approach overestimated the effect of volunteering since it did not take account of the selection bias since volunteers are recruited from people whose characteristics are positively correlated with QoL. Both regression approaches showed the weak effect of volunteering in countries where the rates of it are high. However, the estimation methods differed in their predictions of the consequences of volunteering among low rate countries. The fixed effect approach suggested stronger effect in those countries than in the first group. On the other hand, the random effect estimator suggested similar effects in both groups and slightly bigger in some countries where the rates are in a middle range.

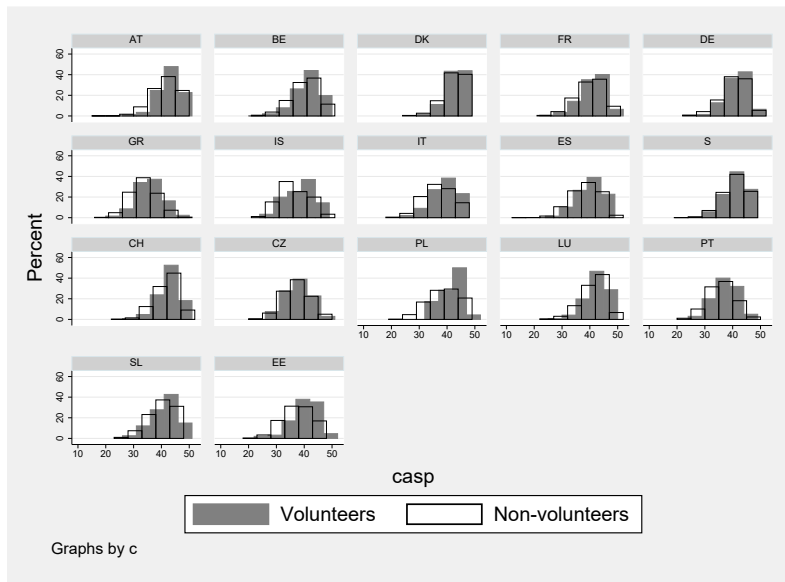
This study delivers arguments for putting a popularization of volunteering among elderly into social policy agenda. The results suggest that it should be put high on the agenda especially in countries where the rates of volunteering among elderly are low. [...]

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## 4 Appendix: additional descriptive statistics



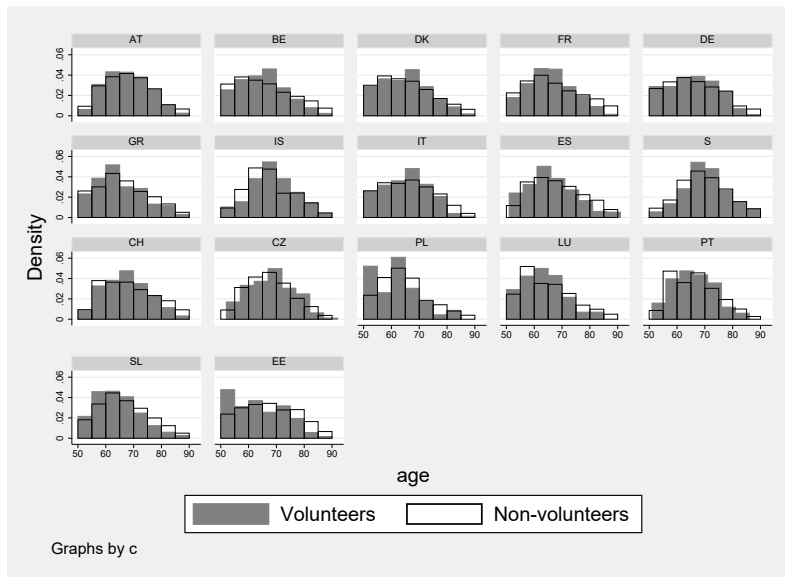
**Figure 4:** Distribution of CASP by countries

**Table 3:** Descriptive statistics

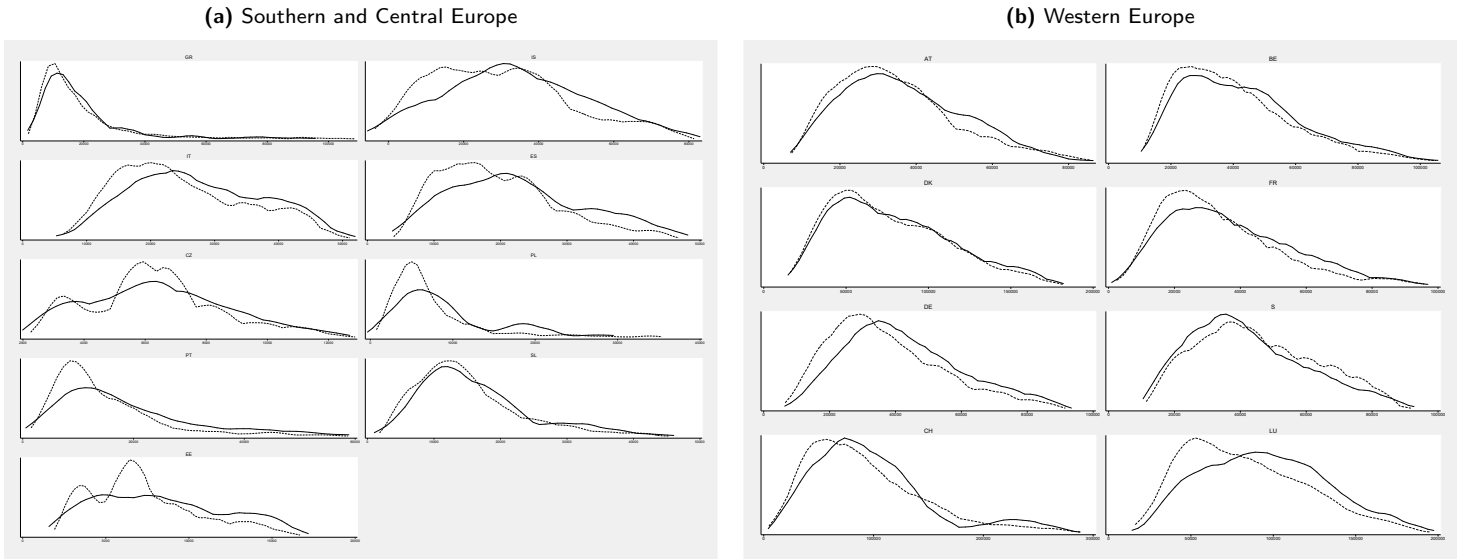
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AT	9.2033829	10.265699	1.360e-06	67.572014	67.137931	.28412576	1.5648385	1.5680581	.89295596
BE	12.452503	13.448703	9.563e-15	65.192629	64.56318	.05577154	1.5114743	1.4912134	.23911998
DK	13.430956	14.09577	4.908e-07	64.853954	64.448137	.25346442	1.5162542	1.5216516	.77985525
FR	11.662631	13.328467	2.548e-24	66.449725	65.589781	.04058251	1.5317659	1.4919708	.0720034
DE	12.735886	13.784978	5.483e-14	65.765275	65.11435	.06395826	1.5116009	1.4697309	.0310427
GR	9.9803405	10.585328	.02886033	65.524253	64.698842	.16674702	1.502088	1.6833977	1.897e-08
IS	12.800777	14.604124	2.533e-09	67.051456	68.190722	.07702694	1.5398058	1.5618557	.57204281
IT	9.3950339	10.828326	7.288e-11	65.653015	64.7897	.05535885	1.4837149	1.5450644	.01350508
ES	9.2916159	12.178195	7.161e-20	67.356542	65.81203	.00786683	1.5004352	1.5676692	.03458958
S	11.754062	12.285895	.00590244	68.954579	69.791579	.04430577	1.5059084	1.5705263	.00933336
CH	8.6844981	9.339562	.00711719	67.679161	66.957664	.07811219	1.5400254	1.5138686	.25229896
CZ	12.369096	13.717514	6.253e-15	66.968976	67.694915	.10751336	1.5689759	1.6045198	.19890075
PL	10.612734	13.23913	3.448e-08	64.133895	61.152174	.01956245	1.5018727	1.5652174	.40060272
LU	11.881925	13.996835	2.255e-13	64.231221	62.958861	.02435831	1.5117371	1.4905063	.51952142
PT	6.7441176	9.1980198	5.893e-08	65.829657	65.613861	.79987422	1.4485294	1.5346535	.10148169
SL	10.809091	11.794966	8.094e-09	65.984091	63.87643	2.799e-06	1.5424242	1.5240275	.47494739
EE	12.009848	14.000568	8.930e-26	66.85847	63.28125	4.553e-11	1.5905853	1.6193182	.29747864

**Table 4:** Descriptive statistics

	0	1	psphusPlus	0	1	psphusMinus	0	1	pincppp
AT	.34392619	.48638838	9.448e-10	.02050231	.01088929	.13811809	42.841735	45.603749	.16827889
BE	.31432545	.40585774	1.925e-08	.01773296	.00669456	.00727404	48.59746	50.30757	.25995231
DK	.59340126	.67774421	6.614e-06	.02814168	.01812689	.09612144	91.833014	91.744422	.97792834
FR	.24412206	.31094891	.00058528	.04952476	.02627737	.01011029	40.668045	43.580263	.10493138
DE	.20417633	.28139013	1.790e-06	.04408353	.02017937	.00126879	44.080265	48.208827	.00430595
GR	.39318985	.43243243	.21485339	.02377128	.04247104	.06512276	24.780007	22.002331	.1628732
IS	.46601942	.47938144	.73249604	.03398058	.01030928	.07743092	33.474285	39.193588	.00157563
IT	.26636569	.29184549	.24797442	.02450822	.02145923	.68919477	26.696711	29.797211	1.936e-07
ES	.2686394	.30451128	.20492206	.03684363	.02255639	.22711737	22.459188	27.40392	8.221e-06
S	.44239291	.45684211	.55900137	.0217873	.02315789	.85103482	48.492528	45.69721	.00947425
CH	.39771283	.50510949	2.054e-06	.02096569	.00583942	.00921271	107.24481	115.36384	.0487876
CZ	.1876506	.30225989	2.679e-07	.06746988	.03107345	.00779576	6.9372808	7.2616364	.11600891
PL	.11610487	.15217391	.4575784	.09363296	.02173913	.09652486	9.3086431	10.077191	.63712334
LU	.30399061	.44936709	3.084e-06	.03286385	.01265823	.06028614	94.63365	104.50259	.02108777
PT	.10661765	.15841584	.12016979	.07352941	.06930693	.87791675	18.635207	20.956911	.26586505
SL	.18068182	.22425629	.03042892	.06098485	.04347826	.14871336	18.323609	19.031487	.43316245
EE	.06596469	.17045455	1.969e-12	.09043047	.03977273	.00123954	7.8953736	9.6478665	2.085e-13



**Figure 5:** Age distribution

**Figure 6: Income and volunteering**

Notes:

Source: Own calculations based on SHARE Wave 6.

**Table 5: Tau CASP**

	IS	AT	IT	FR	DE	SE	BE	PL	CH	GR	DK	CZ	S
	0.155	0.201	0.118	0.229	0.239	0.147	0.266	0.03	0.295	0.07	0.314	0.089	0.063
	0.154	0.141	0.144	0.123	0.109	0.103	0.101	0.09	0.086	0.082	0.064	0.053	0.033
IS	0.584												
IT	0.641	0.879											
FR	0.19	0.362	0.237										
DE	0.05	0.089	0.036	0.434									
SE	0.021	0.034	0.009	0.24	0.711								
BE	0.018	0.026	0.006	0.203	0.636	0.914							
PL	0.015	0.025	0.01	0.136	0.38	0.538	0.593						
CH	0.006	0.009	0.003	0.067	0.238	0.362	0.41	0.84					
GR	0.002	0.001	0	0.022	0.117	0.201	0.241	0.71	0.875				
DK	0	0	0	0.002	0.015	0.027	0.035	0.25	0.309	0.316			
CZ	0	0	0	0	0.001	0.002	0.003	0.09	0.105	0.087	0.546		
S	0	0	0	0	0	0	0	0.01	0.012	0.006	0.109	0.281	

**Table 6: CASP vs. volunteering (OLS)**

	AT	BE	DK	FR	DE	GR	IS	IT	ES
vol	1.02***	0.51**	0.28*	0.54**	0.59***	1.69***	1.55***	1.84***	1.18***
age	-0.02+	0.03***	0.01+	0.01	0.03***	-0.05***	0.05**	0.00	-0.05***
female	-0.26	-0.18	0.24+	-0.41*	-0.01	-0.61***	0.00	-0.47**	-0.20
edu	-0.05**	0.04+	-0.03+	0.12***	0.07**	0.12***	0.22***	0.03	0.06***
1b.sphus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.sphus	-0.90**	-0.83**	-1.38***	-0.67+	-0.81*	-1.27***	-1.18*	-2.15***	-0.45
3.sphus	-2.44***	-2.51***	-2.20***	-2.04***	-2.14***	-2.60***	-0.84	-2.73***	-2.19***
4.sphus	-4.98***	-5.10***	-3.99***	-4.39***	-4.37***	-4.70***	-1.88**	-4.58***	-4.43***
5.sphus	-6.12***	-8.30***	-6.25***	-6.22***	-6.68***	-6.26***	-4.75***	-5.90***	-7.34***
income	0.00	0.00	0.00+	0.00	0.01***	0.00	0.01	0.08***	0.02***
constant	45.02***	39.96***	43.05***	40.12***	39.66***	38.04***	30.38***	36.93***	42.85***
N	2487	3988	3011	2607	3410	3364	1163	3556	3643

**Table 7: CASP vs. volunteering (OLS)**

	S	CH	CZ	PL	LU	PT	SL	EE
vol	0.64**	0.46*	0.48+	1.62*	0.40	1.18*	0.70**	1.41***
age	-0.04***	0.00	-0.01	0.01	0.05***	-0.00	-0.03**	-0.03***
female	0.28+	-0.17	-0.07	-0.28	0.20	0.01	-0.00	0.76***
edu	-0.08***	-0.01	-0.02	0.23***	0.06*	0.04	0.11***	0.06*
1b.sphus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.sphus	-0.95***	-0.95**	-1.24**	-1.17	-1.35**	-1.82*	-0.93*	-1.39*
3.sphus	-2.51***	-2.92***	-2.87***	-3.19**	-2.74***	-2.56***	-2.82***	-2.50***
4.sphus	-3.96***	-4.52***	-4.19***	-5.03***	-4.63***	-4.12***	-4.23***	-4.57***
5.sphus	-6.06***	-5.33***	-6.73***	-7.16***	-7.51***	-6.87***	-6.44***	-7.40***
income	0.02***	0.00	0.05*	0.00	-0.00+	0.01*	0.01	0.15***
constant	44.90***	43.57***	40.12***	39.23***	39.94***	38.49***	43.35***	40.44***
N	3096	2220	3541	1103	1139	907	3031	3527

**Table 8: Wellbeing v. volunteering (Multilevel Linear Model)**

	(1)
casp	
vol	0.91***
age	-0.01***
female	-0.10*
edu	0.06***
o..lsphus_2	0.00
.lsphus_3	6.79***
.lsphus_4	5.72***
.lsphus_5	4.35***
.lsphus_6	2.38***
o..lsphus_7	0.00
income	0.00***
averageGDP	0.26***
avGDP2	-0.00**
.lcountrySH_2	-1.78***
.lcountrySH_3	-0.14
.lcountrySH_4	-1.56***
.lcountrySH_5	-0.85***
.lcountrySH_6	-6.87***
.lcountrySH_7	-4.42***
.lcountrySH_8	-3.87***
.lcountrySH_10	-2.48***
.lcountrySH_11	-1.21***
.lcountrySH_12	1.75+
.lcountrySH_13	-3.06***
.lcountrySH_14	1.44**
.lcountrySH_16	22.54**
.lcountrySH_18	-3.01***
o..lcountrySH_19	0.00
o..lcountrySH_20	0.00
o..lcountrySH_47	0.00
constant	22.91***
sd(vol)	0.22***
sd(Residual)	4.52***
N	45764

## 5 Statistical Appendix

Mean decomposition for a fixed-effect model

$$casp_{i,c} = \beta_{0c} + \beta_{1c} * v_{i,c} + \gamma_c * Z_{i,c} + \epsilon_{i,c} \quad (6)$$

$$E[casp_c | v_{i,c} = 1] = \beta_{0c} + \beta_{1c} + \gamma_c * E[Z_c | v_{i,c} = 1] = \beta_{0c} + \beta_{1c} + \gamma_c * \bar{Z}_c(1)$$

$$E[casp_c | v_{i,c} = 0] = \beta_{0c} + \gamma_c * E[Z_c | v_{i,c} = 0] = \beta_{0c} + \gamma_c * \bar{Z}_c(0)$$

$$E[casp_c | v_{i,c} = 1] - E[casp_c | v_{i,c} = 0] = \beta_{1c} + \gamma_c * [\bar{Z}_c(1) - \bar{Z}_c(0)]$$



Mean decomposition for a random-effect model

$$casp_{i,c} = \beta_0 + \beta_{1c}(r_c) * vol_{i,c} + \gamma * Z_{i,c} + \epsilon_{i,c} \quad (7)$$

where:

$$\beta_1 \sim N(\gamma_{1r} \ln(r_c), \sigma_r^2) \quad (8)$$

$$\begin{aligned} [E[casp_c | v_{i,c} = 1] &= \beta_0 + E[\beta_1(r_c) | v_{i,c} = 1] + \gamma * E[Z_c | v_{i,c} = 1] + E[\epsilon_{i,c} | v_{i,c} = 1] = \\ &= \beta_0 + [\beta_1 + u_r(c)] + \gamma * \bar{Z}_c(1) + \bar{\epsilon}_{i,c}(1) \end{aligned}$$

$$E[casp_c | v_{i,c} = 0] = \beta_0 + \gamma * E[Z_c | v_{i,c} = 0] + E[\epsilon_{i,c} | v_{i,c} = 0] = \beta_0 + \gamma * \bar{Z}_c(0) + \bar{\epsilon}_{i,c}(0)$$

$$E[casp_c | v_{i,c} = 1] - E[casp_c | v_{i,c} = 0] = [\beta_1 + u_r(c)] + \gamma * (\bar{Z}_c(1) - \bar{Z}_c(0)) + [\bar{\epsilon}_{i,c}(1) - \bar{\epsilon}_{i,c}(0)]$$