

The effects of human capital on social capital: a cross-country analysis

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Version 1.61, 22nd July 2003

Abstract

This paper uses two sets of cross-country micro datasets to analyse individuals' participation in voluntary and community activities and organisations. Analysing countries in the International Adult Literacy Survey and focusing on the impact of human capital I find a consistently positive effect of years of education on participation with the marginal effect of an additional year being around 2 or 3% for most countries. The effects are somewhat higher in English speaking countries. However controlling for functional literacy reduces this significantly with literacy accounting for around half the marginal effect of education. Labour market effects are generally very weak Using instrumental variables for a subset of countries we test and are unable to reject the hypothesis that education is exogenous. Using Eurobarometer data yields higher estimated impacts of schooling for most countries. It is also shown how attitudes towards the "third sector" predict higher participation in some forms of volunteering while a measure of religiosity often predicts more altruistic volunteering.

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1 Introduction

The benefits of education are a subject of perennial fascination to labour economists and the wider community generally. The research literature on measuring the returns to education is voluminous and has attracted the attention of a wide range of scholars¹. The focus of this work has been on the *private* returns to education: the impact on the individual themselves. The outcome of interest is usually hourly earnings but occasionally other outcomes such as labour market status or health are studied.

However there is also a long standing popular view that education generates significant external benefits, that is other people benefit from an individuals education, and hence that the social returns exceed the private returns. If true this would provide a compelling argument for public subsidies to education since we would not expect individuals to take these externalities into account when making the decision to invest in education. Note that these debates typically take place in the context of human capital model where education raises the productive capacity of the educated and hence of society. In a signalling model, where education merely signals to employers who is innately productive, the private returns *exceed* the social returns.

Despite the widespread informal view of the importance of externalities, it has proved rather difficult to isolate and measure these effects. One potential channel that is well established is an inter-generational effect: well-educated parents tend to have well educated children. However this is not typically considered an externality in that one assumes that parents are altruistic towards their children and are both aware of and intend any spill-over effects that occur to their own children. There is moreover an opportunity for the children to, somehow, “pay back” some of the benefits by providing care later in life².

The literature on finding education externalities has been revived in recent years, partly in the light of the now fashionable idea of *social capital*. Associated with Robert Putnam but with many earlier antecedents particularly in sociology, this thesis argues for the importance of social capital, informal networks of individuals or norms that promote co-operation amongst

¹ See Harmon, Walker & Oosterbeek(2003) for a recent survey and Card(1999), Heckman & Carneiro(2003) for important recent contributions.

² See Chevalier, Denny and McMahon(2003) for evidence on the intergenerational link for a large number of countries.

individuals³. Social capital takes many, indeed a bewildering number of, forms but includes participation in community activities and voluntary groups. Indeed Francis Fukuyama defines social capital as “..an instantiated informal norm that promotes co-operation between two or more individuals” (Fukuyama(2001) p7). In that view, the activities considered in this paper are not social capital but merely outcomes of it.

There is a general view by proponents of social capital that higher levels of education increases social capital, according to Fukuyama for example “.. the area where governments have the greatest direct ability to generate social capital is education” (*ibid* p18). The precise mechanism is often not clearly specified but it partly relies on the notion that schools impart good standards of behaviour, help to socialize young people and also enable them to engage in society by virtue of being better informed.

Of course measuring whether such participation is beneficial to society of itself, whether social capital really matters, is far from clear empirically. The technical challenge of inferring the presence of these effects is not trivial (see Durlauf(2002 a, b)) particularly given the sort of data typically available to researchers.

In this paper I side-step the issue of the benefits of social capital and ask whether there is evidence that education does indeed have an impact on individuals propensity to participate in community and voluntary activities (henceforth denoted “volunteering”). Recent papers in this vein include Gibson(2001) , Milligan *et al*(2003) and Dee(2003). Leaving aside - for the moment - the issue of whether an association between volunteering is a causal one, a central question has to be what is the mechanism that causes more educated individuals to volunteer more often. The relatively small economics literature analysis has focussed on volunteering as consumption good for example Brown and Lankford(1992). Perhaps the most obvious argument is that since higher education is associated with a higher opportunity cost of time, through higher earnings, we would expect a negative effect of education on volunteering, other things being equal. However volunteering typically takes place out of work time so there may be little or no trade-off. If the activity permits informal job-search then a positive effect could arise. Banks and Tanner(1998) focus on these wage effects on the supply of volunteer hours. They show that is important to allow for the joint determination of wages and volunteering. Contrary to the opportunity-cost argument, they find that allowing for this, higher wages are associated with *more* hours supplied.

³ Putnam(2001). There are in fact numerous definitions or conceptions of social capital, see Paldam(2000) . OECD(2001) provides a recent overview and Durlauf(2002) presents an alternative view.

They also find, *inter alia*, that higher education levels have a well-determined positive effect on hours.

However this is probably not the sort of mechanism that advocates of education externalities have in mind. Offe and Fuchs(2002) suggest that school “...is the first nonfamilial context in an individuals life that trains...moral and cognitive capacities favouring cooperation”. Furthermore, they argue, schools serve as institutional environments that favour informal associability amongst peers and fellow members. They note a counter-argument namely that education may foster individualistic and competitive attitudes and hence reduce voluntary activities. One could also argue that insofar as these voluntary activities are altruistic, educated people maybe more aware of the deficiencies in society, that is those that are not adequately catered for by either market mechanism or the public sector. An additional hypothesis to the *awareness* argument is a *niceness* one, that educated people are more altruistic. There seems to be no obvious reason to subscribe to this in the absence of good evidence. Ellison(1992) provides evidence that educated people are , in a particular sense, “nicer” but given the somewhat subjective nature of the measurement (an assessment by the interviewer) and the sample (a survey of black Americans) its not clear how much one can generalize from this. Uslaner(1999) measures the effect of education on a set of eight indicators of moral behaviour but it is not significant in any of them contrary to his prior.

The precise nature of the voluntary activity may be informative about the mechanism. For example Milligan *et al*(2003) model the impact of education on the probability of voting, another form of voluntary behaviour. Political scientists argue that education would have the effect of raising people’s awareness of political issues and thus, to some extent, politicising them⁴. For example the higher literacy caused by greater education might enable individuals to be more aware of current affairs, to read political literature and so on.

As noted earlier, all of this discussion assumes that we are observing a causal effect of education on volunteering. A rival explanation is that we are observing a spurious correlation i.e. that the association in the data reflects the effect of some omitted variable which is correlated with education or that there is feedback from the dependent variable to education. If for example some people have more initiative or energy in general then we may well observe them having both higher levels of education and of volunteering. Assuming that we don’t directly observe this “get up and go” factor, the results will at least partly reflect a spurious correlation. Concerns about such unobserved heterogeneity motivate the paper by Gibson (2001). Using a sample of

⁴ See Rosenstone and Hansen(1993) for example.

eighty five sets of identical twins in New Zealand, he shows that the cross-section data are consistent with the expected result: higher education is associated with a higher probability of volunteering. However using the difference between twins to eliminate unobserved heterogeneity, assumed to be identical within pairs, reverses this result: education is associated with a lower probability of volunteering and a lower supply of hours volunteered. Remarkably, this negative effect is statistically significant⁵.

Concern over identifying causal effects is also behind Dee(2003) who analyses the impact of education on “civic engagement” defined here to include voting and support for free speech. Using state (US) child labor laws as an instrument variable for education, he finds that the instrumental variable estimates on voter participation are twice as big as in the OLS estimates: an additional year of schooling causing a 6% higher probability of voting. On the other hand, analysing the effect of education on membership of or participation in groups, as this paper does, has the opposite effects. He finds that the instrumental variable estimates are lower than OLS, marginal effects falling from around .22 to about .15 . The implication is that least squares overestimates the impact of education because it is positively correlated with some omitted variable which also has a positive effect on voting.

Milligan *et al* (2003) also analyse a number of outcomes of interest using both child labour laws and changes in minimum schooling leaving age. Their results are mixed. For the most part the use of IV increases or doesn’t change the marginal effect of education on the probability of voting but this depends on whether one conditions on whether individuals are registered to vote. The endogenous variable of interest here is binary whether an individual has high school education or more. Unfortunately, applying IV/2SLS to such a model does *not* produce consistent estimates of the parameters of interest (unlike where the endogenous variable is continuous) and maximum likelihood methods should be used or a semi-parametric estimator⁶.

Regrettably neither of the above papers present tests for endogeneity. This is important because there is a price to be paid for using IV: much lower precision typically and small sample bias. That education is endogenous in an earnings equation (say) does not imply that it is endogenous with regard to some other outcome and of course there is no guarantee that “good instruments” for an earnings equation will be good for something else.

An interesting theoretical perspective on the interaction between social capital is presented in Glaeser, Laibson and Sacerdote (2002). They model an individual’s decision to

⁵ The inferences are based on “heteroscedastically-robust standard errors”, the use of which is questionable in a probit, see Wooldridge(2002) p461.

invest in social capital much like a standard neo-classical investment problem for physical and human capital. Hence they find that such investment is decreasing in the discount rate and this generates a positive correlation with schooling though of course neither causes the other. They also predict that investment in social will be concave in age.

Following an overview of the raw data in section 2, section 3 analyses the determinants of one measure of social capital for a large number of countries in using the International Adult Literacy (IALS) data. Section 4 addresses the issue of endogeneity for a smaller number of countries in the IALS while section 5 uses Eurobarometer data to address these issues. Section 6 concludes.

2 Data

The first dataset we analyse is the International Adult Literacy Survey. The dataset was collected in the 1990's and was a joint effort between OECD, Statistics Canada and UNESCO⁷. The second set of data used here is one of the Eurobarometer surveys (from November 1998) collected by the European Commission (DG X).

The first set of results focuses on one question in the IALS that was administered to all participants "How often do you participate in community and voluntary activities?" Respondents were offered five possible answers daily, weekly, monthly, several times a year or never. No information was sought on what the nature of these activities was. Table 1 below provides a cross tabulation of the responses where the first two categories have been merged. The two language groups in Switzerland and Canada are kept apart, as they were collected separately⁸.

One can see that there is considerable variation between countries. The easiest way to see this is to look at the "never" column where over 80% of the Italian and Polish are compared to a low of 36% in Sweden. It is difficult to discern many other obvious patterns but it is noticeable that the four Eastern European countries all report a low incidence of volunteering on a daily/weekly basis. It may be the case that in countries where there has been a strong, not to say heavy handed, role for government, that either the opportunity or desire for voluntarism is diminished. While Sweden is clearly the leading country this is not particularly a Scandinavian or

⁶ See Wooldridge(2002) pp 477-478.

⁷ See OECD(2000) for more details.

⁸ I have omitted the Italian speaking Swiss since they are a small proportion of the population. The Australian data is not available to researchers outside of Australia. Belgium here refers to Flanders only and Germany is the region formerly known as West Germany. I also omit all students and those less than 18 years.

Nordic effect since its neighbouring countries are not that similar. There is no particular North American effect either, indeed the differences within the language groups in Canada are as big as between many countries. That the United States emerges well from these numbers would come as no surprise to De Tocqueville(1945) who found in the mid nineteenth century that Americans were more willing to help others than Europeans and overcome collective action problems through “self-interest rightly understood”. A glance at the numbers also suggests a religious effect with Catholic countries having a low incidence of volunteering⁹.

3 Results from the International Adult Literacy Survey

This section presents the results of a simple econometric analysis of the probability of an individual participating in voluntary and community activities. The dependent variable is a binary variable indicating whether an individual ever participates in such activities (i.e. the first three columns in Table One against the fourth). This throws away some information but it has the advantage that marginal effects are easier to compute and the treatment of endogeneity, later in the paper can use standard linear methods. Models for ordered responses exploiting all the variation in the dependent variable yield qualitatively similar results. As the key measure of human capital I use years of schooling completed by an individual. An alternative would be to use highest level of education completed. Again this yields similar results to the linear-in-schooling model but is more cumbersome to deal with.

Since it was important to have a comparable specification across countries it would have been unhelpful (not to say time consuming) to “fine tune” each country’s specification. The other covariates used are age, age squared, the number of people in the household and dummy variables for sex, living in a rural area, being unemployed, retired, a homemaker, an immigrant and living alone. Immigrant status is simply based on country of birth and does not take into account how long one has lived there. One could do this for some countries but not all. Marital status is not included, as some countries data did not include this. Earnings, which is banded into five categories in IALS, is not included because it was in general not significant. This was, surprisingly, quite a robust finding. As Banks and Tanner(1998) show the coefficient on earnings is sensitive to whether one models the decision to volunteer jointly with the determination of earnings.

⁹ In fact the correlation between the proportion of the population who are Protestant and the proportion never volunteering is -.87. By contrast in Offe and Fuch’s(2002) study of Germany they argue that Roman Catholicism should correlate *more* strongly with social capital than Protestantism (p208).

The covariates chosen are an attempt to pick up some of the more obvious demographic characteristics of an individual. The labour market variables will reflect the amount of time an individual has. What the data lacks is other attitudinal variables reflecting the character of an individual or their general views about society.

Table 2 shows the marginal effect of two variables of interest on the probability of “ever volunteering”. The first specification shows the marginal effects from a probit¹⁰. So other things being equal, each additional year of full time education for English speaking Canadians, increases the probability that they will do some voluntary or community activity by nearly 4%. The second specification estimates the same model but by OLS. In general one can see that this, linear probability model, gives very similar results to the probit so we use OLS hereafter. The education coefficient is everywhere positive and statistically significant at conventional levels of significance. There is relatively little variation in the parameter with most values clustered around about .025, the two extremes (USA & Netherlands) not being very different. So in general acquiring a four year university degree is going to be associated with about a 10% higher probability of an individual volunteering.

Distinguishing a pattern across these parameters is not straightforward. It is weakly correlated (0.28) with the mean of the dependent variable (1 minus the proportion given in the last column of Table 1). However there is one variable which stands out namely whether English is the spoken language. A simple regression of the marginal effect of a years schooling on a dummy for English speaking countries yields a coefficient of .013 (and a t statistic of 3.71) and this explains 40% of the variation in the parameter¹¹. So the marginal effect of education on the probability of volunteering is about 1.3 percentage points higher (3.3% as against 2%) in English speaking countries.

The existing literature is somewhat vague on why exactly education might make one more civic minded but there seems to be a general suggestion that education plays an enabling role. In this case a better measure of this would be an individual’s functional literacy. In the second specification I include a measure of literacy. In the IALS literacy is measured in three dimensions, prose, document and quantitative. Unlike conventional measures of literacy, which tended to be binary, these measures are continuous and reflect individual’s capacity to extract information from one or more texts and to use this information. This paper takes the average over

¹⁰ I use the “dprobit” routine in Stata 7. Estimates of the other parameters are available on request.

¹¹ Of course such a regression is *ad hoc* and fails to take account the stochastic nature of the data.

all three rather than attempting to distinguish between different forms of literacy since they are highly correlated.

The coefficients for schooling and literacy are shown in the third specification in Table 2. Without exception the coefficient on literacy is positive and well determined. Introducing this variable reduces the coefficient on schooling significantly, by around a half or more on average. In Chile, Denmark, Netherlands and Slovenia one can no longer reject the hypothesis that the coefficient is zero suggesting that all of the impact of education on volunteering is associated with greater literacy. This is a significant finding in that one can see that the direct effect of education is typically rather small when one strips out functional literacy. The standard deviation of years schooling in most countries is around 3 and that of literacy is normalised to be one for each country so one can make the coefficients comparable, approximately, by multiplying the schooling coefficient by three. In most cases the literacy effect dominates but there are exceptions like Germany, Hungary and the Czech Republic. Of course this is not to undermine the value of education in generating voluntary behaviour since formal education is an important input into literacy.

The final specification in table 2 uses an alternative dependent variable, a dummy which is one if the individual participates in voluntary activity at least monthly. The results are quite similar to the preceding one. The marginal effects for schooling are generally smaller. Schooling is now no longer significant in Switzerland whereas it now is in Chile and Slovenia. It remains statistically insignificant in Denmark and the Netherlands. One noticeable difference with the third specification is that literacy does not have a well determined effect in five countries.

A number of interesting patterns emerge, the effect of being female is mixed 'though it is predominantly negative. Those living in rural areas (defined as a community of less than 20,000 people) are without exception more likely to volunteer. Household size has a non-linear effect: those living alone are more likely to volunteer presumably so as to meet people. In general though the probability of volunteering is increasing in household size. This may reflect the presence of children and participation in activities associated with them. Where there is a significant effect, being an immigrant has a negative effect on volunteering. This could reflect the fact that immigrants may feel less incentivised to invest in social capital if they have a lower attachment to their host society or they maybe inhibited from joining existing networks. This is somewhat inconsistent with the "free social space" argument mentioned above that marginalized individuals may be *more* likely to participate to overcome the inherent difficulties that face them.

Labour market effects are rather weak, unemployment for the most part doesn't matter but where it does it has a negative effect suggesting that the extra free time the unemployed experience isn't translated into hours volunteering. If unemployment has a scarring on individuals leading to feelings of alienation or low self-worth then we would expect a negative effect. The effect of being retired is also, if anything, negative. Age has an increasing concave impact but they are not always well determined.

Of the many other potential covariates, two are worth mentioning. Firstly, since values and attitudes are seen as central to social capital it might be thought that parental effects would be important. The only parental variables in the data are the highest level of education completed by each parent. I have excluded them because in almost every country in our data one could not reject the restriction that the coefficients were jointly zero. Secondly in tracing the decline of social capital in the United States, Putnam(2000) points to the baleful influence of television: becoming a nation of "couch-potatoes" leads to lower engagement in society¹². This is a plausible hypothesis that is worth testing. The data contains a question on frequency of television watching. Using this as a covariate would indeed produce a well-determined negative effect on the probability of volunteering. However there is no compelling reason to take this as a *causal* effect. Individuals have so much to allocate between rival activities so if they spend more on one then they necessarily spend less on another.

4 Endogeneity of schooling

As discussed above, some of the recent work in this area raises the question of whether one can think of schooling as an exogenous determinant of measures of citizenship/social capital if one is serious about recovering the causal effects of human capital. To use instrumental variables requires having exclusion restrictions (variables that affect education but do not directly affect volunteering in this case) and many researchers have relied on various "natural experiments" in the data¹³. It is therefore difficult to make comparable IV estimates for all countries in the data since not at all countries will have similar experiments.

This section applies a similar identification strategy to estimation for four of the countries in the data, Great Britain, Italy, Northern Ireland and the Republic of Ireland. The first three experienced an increase of the minimum legal school leaving age. Harmon & Walker(1995) use

¹² See also OECD(2003) p50.

¹³ In fact one can avoid the traditional exclusion restrictions, see Vella and Verbeek(1997) and Hogan and Rigobon(2003) for such alternative approaches to IV in the schooling returns literature.

this in their IV estimates of schooling returns in Great Britain with the result that the IV estimates are considerably bigger than the OLS estimates. Brunello, Comi and Luciforo (2001) also use an increase in the minimum schooling leaving age and a measure of risk aversion for Italy with IV estimated returns being significantly (almost 50%) bigger. For the Republic of Ireland, the abolition of fees for secondary schools in the late 1960's had a similar effect and Denny and Harmon(2001) use this to estimate the schooling returns with the IV returns double that of OLS. The latter paper relies on instruments that are interactions of the dummy variable representing the reform with family background. This is because one would expect the reform to have differential effects by family background with the better off unconstrained individuals responding less. The direct effect of parental education is not used here as an instrument since it might be correlated with the outcome of interest (volunteering) through for example the transmission of value or attitudes that are correlated with education. It also obviates Card's(1999) criticism of Harmon & Walker(1995) that the reform dummy may simply be picking up aggregate trends. A similar identification strategy is used by Card(1995) and Kling(2001) who interact distance from college with family background.

Table 3 presents the IV results of estimating the third specification in Table 3. For each of the four countries there are four specifications. The first treats schooling only as endogenous and uses the policy reform dummy as an instrumental variable. The model is therefore exactly identified. For each of the four countries schooling is no longer well determined and indeed with the exception of Great Britain literacy is no longer statistically significant. However the p-value associated with the exogeneity shows that we cannot reject the hypothesis that schooling is in fact exogenous. The second specification includes three additional instruments: these are the interactions of the reform dummy with those representing the fathers education : these main effects of father's education are covariates in the main equation.

Father's education in the data is represented by highest level completed . I define three dummies corresponding to father having completed the junior cycle of secondary school, having completed the senior cycle of secondary schooling or having completed a third level education (ISCED2, ISCED3 and ISCED5-7 respectively). The omitted category is father having only completed primary school or having no education at all (ISCED0 or ISCED1). This has little effect on the schooling coefficient but has the effect for Ireland and Northern Ireland of returning the literacy coefficient to statistical significance and somewhat higher in magnitude than the OLS estimates. In any event since the exogeneity test does not allow us to reject the exogeneity of schooling so it is far from clear that IV is required. The Hansen/Sargan test for over-

identification does not reject the over-identification restrictions. Using the Basman test leads to identical conclusions.

In the third specification, using the same instruments as before, literacy is also treated as endogenous. As one would expect this leads to loss of precision for literacy. The test for exogeneity applied to either or both of the endogenous variables again does not allow one to reject exogeneity. Note however that the point estimate of the effect of literacy (.583) is enormous, albeit poorly determined, relative to almost any of the other estimated effects of literacy.

As a final attempt to deal with any endogeneity, the direct effects of fathers' education are treated as instruments not as covariates. The results are more complicated. In Italy and Ireland we can still no longer reject exogeneity and both coefficients of interest are not well determined. For Great Britain one can reject the exogeneity of literacy and the estimated coefficient on literacy .224 is much larger than the corresponding OLS estimate, .095 and is significantly different from zero. However the over-identifying restrictions only just pass at the 95% level. This is not too surprising since Great Britain is one of the very few countries in which the direct effects of parental education on an individual are statistically significant. In Northern Ireland there is also evidence that literacy is endogenous in this model.

What then is one to conclude about allowing for endogeneity of human capital in estimating its impact on the probability of participating in voluntary and community activity? Using instrumental variables that have been used with some success in estimating the effects of schooling on wages it is not clear that there is an endogeneity problem in the first place. Given the inevitable loss of precision using two-step methods it is not obvious that the "cure" is worse than the "disease" if indeed the disease exists in the first place.. Of course applying IV makes strong assumptions especially given the existence of a limited dependent variable. An alternative strategy would be to use semi-parametric methods but it seems doubtful if this would lead one to substantially different conclusions.

5 Further results from Eurobarometer

The IALS data tells us nothing about what sort of activities individuals are participating in. To find out more we turn to another dataset, the Eurobarometer. This data asks individuals which of a number of voluntary activities they participate in. Unlike the IALS however it does not ask about the frequency of participation. Only countries in the European Union are surveyed.

The sample size per country is much smaller, around 1000¹⁴. The background variables are in some respects richer than in the IALS with questions on individuals' attitudes including some on the role of the private and public sector. I have tried to make the estimates based on the two datasets roughly comparable but have taken advantage of some of the additional possibilities permitted by Eurobarometer.

Individuals are asked whether they participate in organisations associated with charity, human rights, sports, culture, consumer affairs, religion, nature, youth, politics, hobbies and others. They may engage in more than one. The first two of these can be best described as altruistic. The remaining eleven categories could be activities that one engages in pursuit of ones private interests. "Religion" here excludes charitable work. The distinction is not clear cut: one can pursue an interest in politics out of selfish or non-selfish motives. Indeed one could be motivated by less than generous motives in supporting charity for example publicity seeking or simply an ego-trip. Nevertheless on balance of probability it seems useful to draw a distinction between the first two categories and the remainder.

Some descriptive statistics are provided in Tables 4A to 4C. The proportion who never, 48%, participate is comparable to that in the IALS data. Human rights and sporting organisations attract the greatest participation. Looking across countries, there is a pronounced Nordic effect with these countries having a low level of no participation, Sweden again coming out best. At a glance there would also appear to be again a correlation with religion, with the obviously Catholic countries participating least¹⁵. Very few people participate in more than about two or three separate activities.

To analyse the data , I define two binary variables, the first ("altruism") is one if either of the first two activities are engaged in and the second "non-altruism" is if any of the others are. Using a set of common covariates, I model the probability of an individual volunteering for these two activities using a bi-variate probit The parameters of interest is the marginal effect of years schooling on the two outcomes shown in Table 5¹⁶.

In general one finds a consistent pattern of well determined positive effects of years schooling on both form of volunteering. The principal exception is Belgium where education has

¹⁴ However for Northern Ireland and Luxembourg they are 322 and 598 respectively so I omit these.

¹⁵ Particularly if one defines "Catholic" as including Greece Orthodoxy. Given that Ireland is something of an exception to this trend, it may be better to describe it as a "Mediterranean" or Southern European effect.

¹⁶ The controls are , years schooling, age, household size, dummy variables for being married, female, self employed, retired, single person occupancy, population of local community and a measure of the extent to which individuals believe that a range of ten services should be provided by private associations. Details of the other parameters are available on request. In all cases the estimated correlation between the two equations is statistically significant.

a small but well determined negative effect on non-altruistic volunteering and no significant effect on altruistic. For Greece and Portugal there are also no statistically significant effects of education on altruism. The marginal effects are typically of the order of 3 or 4% per additional year of education which is somewhat higher than the results from the IALS reported in Table 3. One cannot tell the extent to which is due to not controlling for literacy. One noticeable outlier is Ireland where both of the marginal effects are around 10%, a multiple of the marginal effect in Table 3 with or without controlling for literacy.

Volunteering one's time is not the only form of altruism of course. The form that we are probably most familiar with is financial: large numbers of people donate money to charities. Looking at data for Great Britain, Banks and Tanner(1997) find that the probability of an individual being a donor to charity increases with education. This is while controlling for income and wealth. Interestingly, they also find that the size of donations increase more than proportionately with income: the rich give a higher proportion of their income.

Of the other parameters in these estimates two are unique to Eurobarometer , firstly a dummy variable measuring of religiosity (based on a yes/no response to the question of whether religion is important to the respondent) and secondly a measure of the respondents belief in the importance of the "third sector" based on asking the individual whether certain roles are best carried out by government, private companies or associations¹⁷. For want of a better term this is labelled "NGO".

The estimated effects of these parameters differ widely in size and significance. Religiosity has a significant positive effect on altruism in around half the countries and is not significant otherwise. With the exception of France and Italy, religion is not significant in the most Catholic countries. The sizes of these marginal effects are generally quite substantial, from a low of .27 in Italy to a high of .79 in Britain. So in Britain being religious has the equivalent effect of 13 years of schooling on the probability of altruistic volunteering. Only in Britain and France is religion associated with non-altruistic volunteering.

By contrast NGO has a positive effect of non-altruistic volunteering in around half the countries and is not statistically significant otherwise. It is associated with greater altruism in only two countries. The size of the effects don't vary much, an increase in the index (which runs

¹⁷ The areas are child care, care for old people, health services, culture and leisure for adults and for children (separately) , education, environment, public amenities, humanitarian aid, helping the disadvantaged and socially excluded. The variable NGO is the number out of these ten who should be taken care of by associations.

from 0 to a maximum of 10) of 1 increases the probability of non-altruistic volunteering by around 7 to 9%. So these two measures to some extent separate the two forms of volunteering.

6 Conclusions

This paper adds to a growing literature examining “social returns” to education, estimating the impact of years of completed schooling on the probability of an individual participating in community or voluntary activities. By social returns one means benefits to society other than those that accrue to the individual such as increased earnings. Clearly individuals volunteer for a number of reasons some of which may be altruistic or they may be more “selfish”. In fact the evidence that individuals who live alone are more likely to volunteer suggests that there is at least some non-altruistic motivation for volunteering.

The implicit assumption made here is that the outcomes that arise from voluntary and community behaviour are by themselves a social “good”. Yet this is not necessarily true. For example participation in the activities of the Klu Klux Klan is, at least to many of us, not an especially desirable phenomenon.

A number of clear results emerge. In general years of schooling is associated with a well determined but, arguably, rather small impact on individuals’ volunteering: each additional year being associated with around a 3% higher probability. The effect is generally higher in English speaking countries. However once we control for individuals level of functional literacy this number is approximately halved and in some countries it is no longer statistically significant. Literacy in general has a robust positive effect on volunteering. There is more heterogeneity in this effect (across countries) than with schooling with a one standard deviation change being associated with between about 3 and 10% higher probability of volunteering.

We consider whether endogeneity of schooling is an issue as some of the most recent econometric literature has. Using instrumental variables based on natural experiments for a subset of countries we are generally unable to reject the exogeneity assumption for education. The IV estimates themselves are badly determined. There seems no compelling reason not to use the OLS estimates.

Using the Eurobarometer data, I distinguish between participation in altruistic organisations and others that are likely to be less altruistic. Education has a well determined positive impact on both with the estimated marginal effects somewhat higher at around 3 or 4%. However there are some countries where education is not associated a higher probability of altruism.

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Table 1 Frequency of participation in community or voluntary activities

	Daily/ weekly	Monthly	Several times p.a.	Never
Canada (English)	0.156	0.111	0.202	0.530
Canada (French)	0.090	0.061	0.200	0.649
Swiss (French)	0.144	0.087	0.099	0.670
Swiss (German)	0.126	0.076	0.138	0.660
Belgium	0.148	0.094	0.096	0.661
Chile	0.127	0.082	0.077	0.713
Czech Republic	0.060	0.083	0.312	0.545
Denmark	0.190	0.105	0.071	0.633
Finland	0.103	0.120	0.276	0.500
Germany	0.131	0.124	0.103	0.641
Great Britain	0.125	0.066	0.162	0.647
Hungary	0.033	0.080	0.300	0.588
Ireland	0.163	0.128	0.135	0.574
Italy	0.090	0.033	0.068	0.808
Netherlands	0.246	0.068	0.078	0.608
New Zealand	0.211	0.118	0.187	0.483
Northern Ireland	0.149	0.083	0.164	0.604
Norway	0.173	0.148	0.137	0.543
Poland	0.043	0.046	0.095	0.816
Slovenia	0.091	0.081	0.110	0.718
Sweden	0.281	0.184	0.174	0.361
USA	0.204	0.130	0.188	0.478

Key: row proportions, weighted averages.

Table 2: Marginal effects of human capital variables in the IALS data

	1	2	3		4	
	Probit	OLS	OLS		OLS	
	Schooling	Schooling	Schooling	Literacy	Schooling	Literacy
Canadian (English)	0.039 (13.27)	0.036 (14.11)	0.018 (5.61)	0.099 (8.88)	0.015 (4.98)	0.078 (7.89)
Canadian (French)	0.036 (9.19)	0.034 (10.10)	0.024 (4.78)	0.060 (2.78)	0.027 (6.21)	-0.005 (0.30)
Swiss (French)	0.015 (3.78)	0.014 (3.74)	0.008 (2.05)	0.047 (3.06)	0.006 (1.72)	0.039 (3.51)
Swiss (German)	0.021 (4.65)	0.020 (4.64)	0.013 (2.63)	0.054 (3.45)	0.008 (1.78)	0.054 (3.91)
Belgium (Flanders)	0.029 (7.16)	0.028 (7.41)	0.015 (3.44)	0.080 (5.99)	0.011 (2.51)	0.075 (6.25)
Chile	0.013 (5.55)	0.012 (5.63)	0.005 (1.60)	0.046 (3.68)	0.007 (2.54)	0.036 (3.17)
Czech Republic	0.021 (6.03)	0.021 (6.14)	0.016 (4.26)	0.031 (2.97)	0.010 (3.45)	0.009 (1.21)
Denmark	0.014 (4.61)	0.014 (4.67)	0.006 (1.60)	0.053 (4.81)	0.005 (1.58)	0.045 (4.36)
Finland	0.019 (6.06)	0.018 (6.31)	0.014 (4.22)	0.035 (2.77)	0.013 (4.38)	0.023 (2.16)
Germany	0.021 (6.10)	0.021 (6.11)	0.019 (5.27)	0.024 (2.03)	0.014 (4.32)	0.005 (0.44)
Great Britain	0.034 (11.05)	0.034 (10.95)	0.019 (5.74)	0.095 (10.98)	0.012 (4.18)	0.063 (8.52)
Hungary	0.033 (9.32)	0.031 (9.54)	0.025 (6.88)	0.043 (3.82)	0.019 (7.12)	0.000 (0.00)
Ireland	0.030 (7.35)	0.029 (7.58)	0.010 (2.29)	0.114 (9.96)	0.009 (2.22)	0.081 (7.58)
Italy	0.020 (9.58)	0.020 (9.64)	0.015 (5.63)	0.043 (4.13)	0.012 (5.18)	0.023 (2.65)
Netherlands	0.008 (3.49)	0.008 (3.44)	-0.000 (0.15)	0.091 (8.89)	0.002 (0.80)	0.077 (7.97)
New Zealand	0.027 (7.83)	0.025 (7.97)	0.018 (5.43)	0.047 (4.67)	0.015 (4.22)	0.035 (3.60)
Northern Ireland	0.029 (8.00)	0.029 (8.00)	0.018 (4.50)	0.071 (7.14)	0.011 (3.14)	0.054 (6.35)
Norway	0.024 (7.22)	0.023 (7.36)	0.009 (2.53)	0.074 (6.52)	0.007 (2.04)	0.062 (5.82)
Poland	0.024 (8.83)	0.025 (8.55)	0.020 (6.11)	0.029 (3.43)	0.016 (6.04)	0.010 (1.57)
Slovenia	0.012 (3.76)	0.011 (3.65)	0.004 (0.99)	0.041 (3.47)	0.007 (2.25)	0.022 (2.23)
Sweden	0.019 (6.96)	0.019 (7.29)	0.010 (3.46)	0.095 (8.75)	0.010 (3.35)	0.066 (5.78)
USA	0.044 (13.34)	0.040 (14.49)	0.023 (6.65)	0.110 (8.60)	0.019 (5.78)	0.078 (6.69)

Notes: Coefficients are marginal effects, t ratios below the coefficients. The dependent variable in the first three models is a binary variable indicating whether an individual ever participates in community or voluntary activities. In the fourth column it's a dummy variable for participation at least monthly.

Table 3: Instrumental Variable estimates

	<i>Ireland</i>				<i>GB</i>				<i>NI</i>				<i>Italy</i>			
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Schooling	.298	-.009	.011	.022	-.046	-.026	-.049	.014	-.175	-	-	-	0.176	.020	.024	.008
	0.53	0.24	0.23	0.58	0.82	0.57	0.75	0.69	0.63	0.011	.008	.009	0.45	0.78	0.78	0.63
										0.22	0.17	.20				
Literacy	-.236	.139	-.142	.055	.158	.136	.583	.224	.260	.094	-	.308	.0345	.029	-	.134
	0.34	2.88	0.43	0.33	2.53	2.67	1.06	3.13	0.92	1.91	.040	1.82	0.45	0.56	.013	1.51
											0.09				0.06	
n	2106	2106	2106	2106	3686	3686	3686	3686	2798	2798	2798	2798	2665	2665	2665	2665
Overid		0.731	.855	.628		.593	.796	.058		.524	.364	.622		.413	.247	.611
<u>Exog tests</u>																
Schooling	.379	.619	.367	.848	.239	.334	.970	.221	.358	.582	.576	.614	.926	.805	.897	.300
Literacy			.341	.715			.301	.009			.760	.066			.828	.226
-both			.562	.935			.347	.000			.819	.006			.947	.317

Dependent variable: dummy variable equal to one if ever participates in voluntary and community activity

Controls: age, age squared, sex, number of people in household, dummy variables for being rural, single person household, immigrant status, retired, unemployed and homemaker, father's education level. T ratios beneath coefficients. P values for Over-identification (Hansen) & Exogeneity (Durbin-Wu-Hausman) test

Spec 1 : Schooling endogenous, reform dummy as instrument

Spec 2 : " " , " " " plus interactions of reform with father's education level

Spec 3: Schooling & Literacy endogenous, instruments as in Spec 2

Spec 4: as in Spec 3 but with dummies for father's education level as instruments not controls.

The reform dummy equals one as follows:

Ireland:

Born in 1956 or later. It is equal to 0.5 if born between 1952 and 1955 inclusive

Great Britain:

Born in 1958 or later in England and Wales. Born in 1956 or later in Scotland

Northern Ireland

Born in 1958 or later

Italy:

Born in 1951 or later

Table 4: Descriptive statistics: Eurobarometer data

A: Participation by type of activity

	Proportion	Std error
Charity	.079	.0023
Religion	.024	.0013
Culture	.063	.0021
Political	.072	.0022
Human rights	.151	.0031
Nature protection	.070	.0022
Youth	.033	.0015
Consumer rights	.030	.0015
Sports	.218	.0035
Hobbies	.088	.0024
Other	.064	.0022
None	.484	.0043

B: Zero participation by country:

	Proportion	Std error
Austria	.470	.0160
Belgium	.521	.0156
Denmark	.156	.0124
Finland	.279	.0148
France	.600	.0165
Germany (West)	.440	.0159
Germany (East)	.589	.0167
Great Britain	.466	.0160
Greece	.764	.0138
Ireland	.493	.0168
Italy	.664	.0153
Netherlands	.207	.0136
Portugal	.738	.0149
Spain	.723	.0151
Sweden	.154	.0153

C: Number of activities participated in:

	Proportion	Std error
0	.484	.0043
1	.284	.0039
2	.137	.0030
3	.061	.0020
4	.022	.0013
5	.007	.0007
6	.003	.0004
7	.001	.0002

Notes: Data are weighted to take account of country size as well as within sample under/over weighting.

Table 5 Marginal effects of years schooling on volunteering

	Non-altruistic	Altruistic
Austria	0.051 3.21	0.067 3.37
Belgium	-0.008 1.93	0.006 1.01
Denmark	0.038 3.13	0.038 3.32
Finland	0.027 2.91	0.059 5.67
France	0.048 3.56	0.047 2.34
Germany (West)	0.04 3.35	0.046 3.1
Germany (East)	0.038 3.84	0.039 2.81
Great Britain	0.05 3.9	0.058 4.05
Greece	0.044 3.59	-0.002 0.11
Ireland	0.092 4.65	0.107 4.5
Italy	0.039 4.08	0.027 2.32
Netherlands	0.031 2.56	0.051 4.43
Portugal	0.038 2.81	0.034 1.57
Spain	0.051 4.45	0.065 3.74
Sweden	0.035 3.05	0.037 4.11

Notes: Estimates are marginal effects from a bivariate probit. T ratios are below the coefficients. "Altruistic" refers to human rights and charities organisations. "Non altruistic" refers to participation in organisations associated with sports, culture, consumer affairs, religion, nature , youth, politics, hobbies and others.