Impact of Social Capital on Income

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1. Introduction[1]

Economic growth and prosperity do not always lead to an increased quality of life. Rapid technological development and scientific progress are often accompanied by social change. The concept of social capital has been gaining importance over the last few decades as it is used to explain certain aspects of an individual's overall well-being. An important question articulated by various stakeholders and social researchers is why some individuals or communities with a given set of material assets are able to prosper over others. The principles behind social capital help provide an answer to this question.

The objective of this paper is threefold. First, we look into the concept and determinants of social capital on the basis of a Polish socio-economic survey data. Following Putnam's [1995] approach we select key social capital components and identify their measures. Second, we analyse the distribution of the chosen determinants across the examined population and construct a synthetic index of social capital based on the selected manifest variables. Finally, we estimate the relationship between individual income and three kinds of endowments: physical, human and social capital in order to quantify the impact of social capital on individual well-being.

We employ a multivariate probit model to construct a single index of social activity. The unique and detailed individual socio-economic dataset collected at the level of local government allows us to make inter-regional comparisons of social development. The paper is organised in the following way. Section 2 reviews the literature on determinants and definitions of social capital. Section 3 provides a descriptive analysis of the dataset, describes our modelling strategy and summarises empirical findings and their implications. Section 4 concludes.

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2. Social capital

The interest in social capital theory has been increasing in recent years mostly due to its wide application to numerous disciplines and subject areas. One interesting feature of social capital is the fact that it integrates sociology and economics, combining a number of diverse ideas such as civic tradition, social engagement, norms, trust, formal and informal interpersonal bonds [Claridge, 2004].

Putnam [1995] argues that social capital has forceful, quantifiable effects on many different aspects of our lives. These quantifiable effects include: lower crime rates [Buonanno et al., 2009; Halpern, 2009], better health [Hendryx et al, 2002; Wilkinson and Pickett, 2009], improved longevity [Putnam, 1995], better educational achievement [Coleman, 1988], greater levels of income equality [Wilkinson 1996, Kawachi et al., 1997], improved child welfare and lower rates of child abuse [Cote and Healy, 2001; Gordon and Jordan, 2006], less corrupt and more effective government [Putnam, 1995; Kingston, 2005] and enhanced economic achievement through increased trust and lower transaction costs [Fukuyama, 1995]. Hall and Jones [1999] argue that social infrastructure is a fundamental determinant of productivity. Knack and Keffer ([997] use cross-country data to show that association activity, measured as membership in formal groups has no direct economic effect but they stress the role of trust and civic norms in contributing to joint actions and a collective economic success.

Another strand of literature deals with determinants of social behaviour. Fukuyama [1995] and Putnam [1993] argue that social capital's roots are buried in centuries of cultural evolution while other researchers (e.g. [Brown & Ashman, 1997]) believe that social capital can be created in the short term to support political and economic development. Aldridge, Halpern et Fitzpatrick [2002] suggest that the main determinants of social capital include: history and culture; whether social structures are flat or hierarchical; family; education; the built environment; residential mobility; economic inequalities; social class; the strength and characteristics of civil society; and patterns of individual consumption and personal values. Pantoja [1999] identifies a different set, including: family and kinship connections; wider social networks covering formal and informal horizontal arrangements; networks; political society; institutional and policy framework which includes rules that regulate public life; and social norms and values. De Blasio and Nuzzo [2010] claim that there exists a considerable individual heterogeneity in the determinants of various aspects of social life. The authors show that older and more educated individuals display a more intense association activity as they meet friends more often and are more involved in local organisations. De Blasio and Nuzzo [2010] also find that home-ownership is associated with good social conduct, while urban residence has mostly a negative impact on public behaviour. Allesina and La Ferrara [2002] show that both individual experiences and community characteristics influence how much people

trust each other. Using data drawn from US localities, the authors find that the main factors associated with low trust are: a recent history of traumatic experiences, belonging to a minority group, being economically unsuccessful, living in a racially mixed community or in an income diverse area. In a similar study, Glaeser at al. [2002] use organisation membership as a proxy for social behaviour. Hendryx et al. [2002] examine the impact of access to health care on social capital and prove that persons with a better access to health services not only live longer but are also more sociable.

The notion of social capital has been around for decades and although its importance is increasing, it remains poorly understood. A wide range of definitions trying to capture the phenomenon exists. The term social capital came into prominence through the work of three authors: Bourdieu [1983], Coleman [1988] and Putnam [1995]. Coleman [1988] and Bourdieu [1997] define social capital as the network of connections that one can mobilize. For Putnam [1995] social capital consists of social life-networks, norms and trust which enable participants to act together and pursue shared objectives. An important difference between Putnam and his predecessors is that Coleman and Bourdieu consider social capital as an attribute of an individual whereas Putnam perceives it as a collective feature. While Bourdieu's definition [1997] puts forward the individual advantage of maintaining social networks, Putnam [1995] sees benefits for effective functioning of communities and society as a whole.

Putnam is undoubtedly one of the most well-known theorists within the social capital paradigm. His definition emphasises the role of networks and civil norms.

> **Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them [Putnam, 1995].**

International organizations have developed their own definitions of the term. OECD [2001] describes social capital as "networks, together with shared norms, values and understandings which facilitate cooperation within or among groups". The World Bank [1999] defines social capital as institutions, relationships, and norms that shape the quality and quantity of interactions with family members, peers, community members, local institutions, and at the broadest level, with society.

> **Social capital is not just the sum of the institutions which underpin a society—it is the glue that holds them together [World Bank, 1999].**

There is considerable debate and controversy over the possibility of measuring social capital. Both OECD and the World Bank are currently progressing

work on the measurement of social capital. Measurement attempts are flawed by problems with separating form, source and consequences [Onyx and Bullen, 2000; Adam and Roncevic, 2003]. Trust may be an example, for it is commonly seen as a component of social capital but some authors equate trust with social capital [Fukuyama, 1995], some see trust as a source of social capital [Putnam et al., 1993], some see it as a form of social capital [Coleman, 1988], and still others see it as a collective asset resulting from social capital construed as a relational asset [Lin, 1999].

Due to the difficulties described above, the measurement of social capital heavily relies upon pre-assumptions and available socio-economic indices. The search for a universal measure continues, with improvements in information systems and increasing availability of local information driving the development of more complex and more comprehensive indices.

An important approach comes from Putnam [1995] who distinguishes five components of social capital: community organizational life; engagements in public affairs; community volunteerism; informal sociability, and trust. Based on these five axes Putnam [1995] puts forward a set of observable measures expressing every dimension.

Putnam proposes various measures for community organisational life, such as: number of memberships in local organisations or clubs, number of civic and social organisations per inhabitant, number of club meetings attended per inhabitant during a year. As a measure of involvement in public affairs Putnam suggests: the turnout in presidential election and participation in public meetings on town or school affairs. As a measure of community volunteerism Putnam proposes: the number of non-profit organisations per inhabitant, percentage of population working on community projects or the number of volunteer placements per year. As a measure of informal sociability Putnam suggests: the amount of time spent with friends per inhabitant or the number of visits to friends or relatives per inhabitant during a year. Trust is measured by Putnam on the basis of individuals' past trusting behaviour and expressed belief that most people are honest.

3. Data and results

We quantify social capital based on the COMPETE database, which is an independent socio-economic survey covering various aspects of life, i.e. households' demographic structure, economic activity, work situation, wealth, living conditions, income, involvement in sports and cultural activity. The sample is representative but covers only five selected municipalities (gminas) at the lowest level of territorial division in Poland: Gostyń, Gliwice, Manowo, Małogoszcz and Zgierz. The selection of municipalities is not random but the dataset is aimed to represent specific features of various regions of Poland.

Gostyń represents economically developed local municipalities from Wielkopolskie and is rich in civic associations and cultural organisations.

Gliwice lies in the Upper Silesia conurbation, a large industrial and post industrial area where mines and steel mills used to be dominant manufactories. Manowo municipality represents a poor, rural area of Zachodniopomorskie. Małogoszcz lies in a poor rural area of central Poland, in the Świętokrzyskie region. Zgierz is a rural area in the suburbs of Łódź. A geographically diversified sample gives us an opportunity to compare the level of social capital in various regions of Poland. The sample contains 500 individual observations for each local municipality. Unfortunately, not all respondents have answered all questions, which is a common problem in socio-economic research. Consequently, the sample used in the model is smaller.

The main challenge in our research is to construct a proper tool for measuring social capital. Consistently with Putnam's five axes of social capital we select five variables, each describing one dimension of social capital: organization membership, participation in local elections, volunteer behaviour, size of social network, and trust. A two-stage modelling strategy is used in this paper. In the first step, we apply a multivariate probit model to build a social activity index. In the second stage, we regress personal and household income based on three endowments: physical, human and the synthetically constructed social capital index. Socio-demographic characteristics which are commonly used in Mincerian-type wage equation serve as control variables to rule out idiosyncratic differences between individuals.

On the grounds of the well established Colman's and Bordieu's perspective we treat social capital as a feature of individuals. Having access to data for one moment in time only, we concentrate on the intrinsic value of social capital for individual present returns and we ignore the impact of social capital on future returns. We match each of the five social capital axes with one manifest variable from the survey and we use standard socio-demographic and psychological variables as explanatory regressors.

The model is analogous to the model used by Platt [2006] to assess the impact of various health measures on social activity. In our setting, the multivariate probit model consists of five equations, one for each social activity dimension. All five equations are estimated simultaneously. This approach allows for flexible associations between the independent and each of the dependent variables. At the same time, the model allows for non-zero correlations among unobservable characteristics specific to each dimension. If all these correlations are equal to zero, then the model collapses to a series of univariate probits. However, if correlations are different from zero, it means that equations should be modelled together.

Group membership is captured by respondents' belonging to a political party, religious organization, trade union, sport club or NGO. Normally, engagement in community life reflects positive attitude to self-organization and cooperative actions but in a post-socialist country where organization membership was obligatory before transition we expect that only unusually active

persons would be members of social organizations. The vast share of the population lives on its own and is not interested in participating in formal organizations.

Participation in local elections serves as the manifest variable for engagement in public affairs. The rate of participation in local elections is usually much lower than in general elections and therefore is a better proxy for civic engagement in local community issues. Individual membership in non-profit organisations is the measure of volunteerism. Regions with high volunteer rates are viewed as more open and better developed socially. We select the frequency of meeting friends in free time as a manifest variable for informal sociability. Spending time with friends is an indicator of the level of individual socialisation. The more friends one has, the more prone she or he is to undertaking common actions.

Table 1.

Descriptive statistics of the five variables expressing various social capital dimensions

Variable	Mean	Standard deviation
Organisation membership	13.59%	34.28%
Participation in local elections	55.04%	49.76%
Volunteerism	22.83%	41.98%
Sociability	26.18%	43.97%
Trust	40.92%	49.19%

Source: own computations based on COMPETE 2009 data.

Participation in local elections appears to be the most widespread indicator of social activity as over a half of population declares to have participated in local elections. However, the real figures are on average 10 percentage points lower. Trust indicator is comparable with other Central European transition countries. It is also worth noting that trust is positively related to education. Interestingly, only 13.5% of population considers themselves to be members of any kind of an organisation.

We separate all available characteristics into two sets. The first set is common for each dimension and consists of standard social and demographic measures, such as gender, having a partner, town size. We do not take into account age and education at this stage to avoid identification problems in the second stage of our estimation.

Each equation is identified with specific characteristics for each dimension. In the first equation (explaining organisation membership) the following variables are included: driving skills, information-related variables (i.e. gathering information from the TV or from the Internet), working status, and participation in on-the-job training. All these specific skills are necessary for active membership in organisations. The following variables are used to ex-

plain participation in local elections: information-related variables and an indicator for petition signing. People who are interested in political and economic issues and regularly following the news are more likely to participate in elections. In the third equation (volunteerism), identification was achieved through variables such as: driving skills, internet usage, part-time employment and health indicators. The first two variables reflect personal skills and the two remaining characteristics express the individual's potential to become a volunteer. Individuals who have time available and who are in a good health condition are more likely to participate in voluntary activities than those bound by time constraints or affected by health issues.

Table 2.
Multivariate probit estimates

Multivariate probit, 100 draws			Observations 2422		
			Wald chi2 653.13***		
Variable	Equation 1 Organization membership	Equation 2 Voting participation	Equation 3 Volunteerism	Equation 4 Time with friends	Equation 5 Trust
gender	.2730***	.0023	.0468	.0235	–.1080*
partner	–.1904***	.3999***	.0516	–.3816***	.1234**
town to 100th	–.1387	.3073***	–.0126	.2746***	.1814**
town	–.1466**	.2914***	–.07667	–.0322	.1616***
car skills	.0400	.3148***	.2733***	–.2027***	
information on TV	.3517***	.1441*	.1840***		
internet	.3415***	–.2188***			
housework	.0518				
part–time employed	–.0824				
happy at work	.0923				
on work training	.2968***				
petition signing		.4122***			
health condition			–.0144		
mobile phone					.3090***
smoke					.1209*
n. of children					–.1190*
weight					–.0002
sport					.3453***
hobby					.2694***
cheat					–.1280*
tolerance					.0244***

Variable	Equation 1 Organization membership	Equation 2 Voting participation	Equation 3 Volunteerism	Equation 4 Time with friends	Equation 5 Trust
marketing					−.1257***
crime victim					.0215
cheat on tax					−.1511
risk taker					−.1622**
contract reader					.1039**

* significance at 10% level; ** significance at 5% level; *** significance at 1% level
Source: own computations.

The fourth equation, representing time spent with friends, was identified through driving skills, possessing a mobile phone, smoking habit, having children, personal weight, doing sport and having a hobby. All these indicators are likely to make a person spend more time with friends. The last equation, describing trust, was identified through propensity to cheating during exams, tax avoidance, tolerance, and proneness to be affected by a marketing action, a recent history of being a crime victim, risk-taking behaviour and reading contracts carefully before signing. All these characteristics reflect personal attitudes to various real-life situations.

Table 3.

Correlations between social activity dimensions

Organization membership	XXX	.1065***	.3891***	.0001	.1313***
Voting participation		XXX	.1890***	−.0561	.1588***
Volunteerism			XXX	.0513	.0896***
Time with friends				XXX	−.0104
Trust					XXX
LR independence	169.6***				

* Significance at 10% level; ** significance at 5% level; *** significance at 1% level
Source: own computations.

The likelihood ratio test of independency between social activity dimensions is strongly rejected, which indicates that the chosen categories are correlated. In other words, the properties of the dataset justify the approach taken. The estimates of correlation coefficients (Table 3) show nearly all social capital dimensions are correlated. The odd one out is time spent with friends, however probably as a result of a weak proxy for socialisation. From the theoretical point of view, non-zero correlations can be interpreted as important interdependencies between Putnam's dimensions. The strongest relation is observed between organisation membership and volunteerism.

These two dimensions describe socially active people who are likely to engage in charity actions. The distinction between these two dimensions appears to be fuzzy.

A number of interesting observations can be made when looking at individual equations. As regards the first equation, we can see that having a partner or living in an average-sized town decreases the probability of belonging to an organisation while being well-informed and well-trained increases the probability of being a member of an organisation. People who easily gather information are usually more active and have better knowledge about various types of organisations.

The estimates of the second equation are rather surprising. Most covariates turn out to be significant predictors for election participation. The only insignificant regressor is gender. Moreover, all but one factor (Internet usage) increase the probability of taking part in elections.

In the third equation, factors such as: internet skills, doing a part-time job and possessing a car driving licence, all have a significantly positive influence on the probability of being a volunteer. This finding is intuitively understandable as people who work part-time usually have spare time which can be spent on charity actions. Internet access and driving skills are additional assets that can be used in charity work.

Most of the covariates used in the fourth equation (describing time spent with friends) were statistically significant. A negative correlation could be observed between the time spent with friends and having a partner or children. These results are in accord with our expectations as people having a partner or children usually spend more time with close relatives than with friends. A positive relationship was found between the amount of time spent with friends and the fact of living in a big town. In bigger cities people usually have wider social networks. Positive coefficients for having a mobile phone or for the smoking habit indicate that these features may increase knowledge-sharing among individuals. Doing sport and having a hobby appear to create additional opportunities to meet other people.

The last equation explains the determinants of trust. Tolerance, the fact of having a partner and the fact of reading contracts carefully all increase an individual's ability to trust others. The first two factors may help establish positive relations with other people while reading contracts carefully may be related to law-abiding attitudes. A negative correlation between trust and cheating in exams, tax-avoidance, proneness to marketing and risk taking was observed.

After estimating the multivariate probit model parameters, we generate fitted probabilities for each of the five social capital indicators. Next, we compute a weighted average of these fitted probabilities, with weights proportional to the share of people declaring a specific activity to obtain a single index of social capital. The distribution of the constructed index is unimodal and similar to the normal distribution.

In the second step we use a standard empirical model where social activity is treated as an income-generating asset. Personal and household income are modelled using human, social and to some extent physical capital, in a combination with regional and household specific characteristics [Grootaert and Bastelaer, 2002]. This framework is adopted from Ameen and Sulaiman [2006], who analysed the interdependencies between social capital and economic well-being in rural Bangladesh.
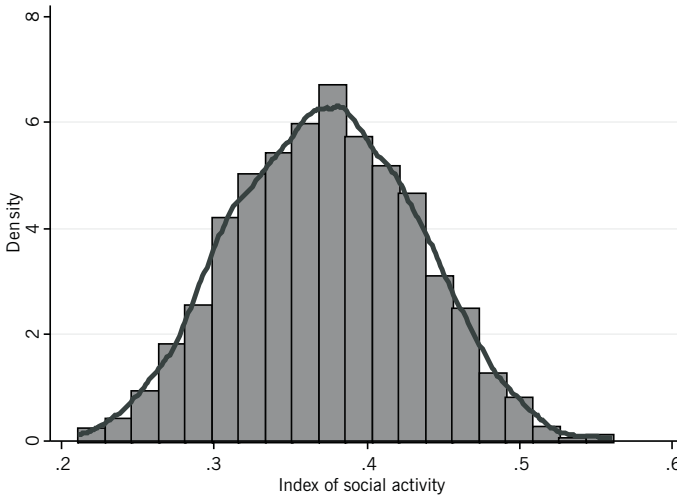

Fig. 1.

Distribution of the social capital index
Source: own computation based on COMPETE 2009 data.

Personal or household income arises as a combination of different types of capital. Human capital describes personal abilities and the potential to generate income. The level of social capital determines the number of gainful interactions that one can establish with his or her economic surrounding. Some of such interactions may result in positive externalities, e.g. new job opportunities. Physical capital guarantees necessary tools and material resources. It is an important factor especially for those individuals and families who rely on self-employment. Regular workers are equipped with physical capital by their employers. The level of capital is not directly observed so we use available proxies. The implied number of years spent at school serves as a proxy for human capital. The index of household assets measures physical capital. Social capital is expressed through the social activity index which we have previously constructed. The Mincer type earning equation is estimated by a simple regression model.

We take advantage of some specific, wage-related questions that are rarely asked in labour surveys and instead of using information about last

month's income, we use the average income over the last three months. Average income for a longer period reflects earning capabilities better than monthly income. We use age and age squared as proxies for working experience. The full specification of the model is as follows:

$$\ln w = \beta_0 + \beta_1 social + \beta_2 human + \beta_3 physical + \beta_4 H_i \tag{1}$$

where: w = average income over the last three months; $social$ = social activity index; $human$ = human capital measured by the level of education; $physical$ = index of physical capital; H = household specific and regional characteristics, we control for municipality and household size.

In order to achieve identification of the parameters in the wage model, we omit variables used to construct the social capital index. For this reason we cannot include information about gender and regional dummies.

We estimate two wage models: one on the individual and one on the household level. In order to be able to interpret not only the signs but also the magnitudes of coefficients, prior to estimation we standardise all variables to obtain a zero mean and unit variance. We use two alternative functional forms: one including age as a proxy for working experience and one without.

Table 4.

Individual level estimates

Dependent Variable: Personal Income	Model 1	Model 2
Age	0.078***	
	(0.016)	
Age squared	−0.001***	
	(0.000)	
Human capital	0.269***	0.253***
	(0.031)	(0.031)
Social capital	0.101**	0.112**
	(0.034)	(0.034)
Physical capital	0.173***	0.191***
	(0.035)	(0.035)
Constant	−1.687***	−0.090**
	(0.317)	(0.031)
R-squared	0.179	0.160
N of observations	991	991

Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, standard errors in parentheses.

Both models estimated at individual level have desirable statistical properties. All variables are statistically significant and the explanatory power is

impressive. The signs and sizes of coefficients are in accord with our expectations and the economic theory. The positive coefficient for age and negative coefficient for age square confirm increasing returns from working experience, yet with a decreasing marginal rate.

The coefficients for all three types of capital are positive. The highest coefficient is found for human capital, which is normal as long as we analyse individual incomes. Roughly 50% of income is owed to human capital, 30% to physical capital and around 20% to social capital. The positive and statistically significant coefficient for the synthetic social capital index suggests a positive impact of social capital on personal income. The more socially active a person is, the higher the wage premium he or she receives.

One has to bear in mind that our social capital index covers various dimensions of social activity. Some of them, like trust and informal sociability are very helpful at work. High level of socialisation may help a worker to quickly become a good team player whereas a high level of trust may be rewarded with being assigned more responsible tasks. Other activities, such as organization membership and involvement in public affairs can rather be seen as obstacles slowing down a professional career since they are time-consuming. On the other hand, there is high demand for workers with good organisational skills.

Table 5.

Household level estimates

Dependent Variable: Household Income	Model 1	Model 2
Age	0.004	
	(0.007)	
Age squared	–0.000	
	(0.000)	
Human capital	0.168***	0.165***
	(0.023)	(0.022)
Social capital	0.093***	0.094***
	(0.023)	(0.023)
Physical capital	0.393***	0.391***
	(0.024)	(0.023)
Constant	–0.056	0.055**
	(0.149)	(0.019)
R-squared	0.268	0.269
N of observations	1969	1969

Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, standard errors in parentheses.

Models estimated at household level are better fitted to data than those estimated on individual incomes. However, working experience is no longer significant. The signs and sizes of other coefficients are fairly similar in both empirical specifications. Physical capital is of the highest importance in explaining the variation of income at household level as nearly 2/3 of household income may be attributed to this type of capital. The remaining variance in income could be explained by human capital (26%) and social activity (14%). It should be stressed that social interactions constitute an important share of income both at the individual and household level.

4. Conclusions

Our research is based on a unique survey conducted at local municipality level in Poland, which comprises a snapshot of social and demographic characteristics. In the first section we look for determinants of social activity using Putnam's model of five social capital components. A few interesting observations were made. The membership in organisations was generally low but it increased with the level of attained education. The rate of participation in local elections was higher than the actual figures reported by the National Statistics Office in most municipalities, suggesting that civil involvement is perceived as a positive attitude. The rate of volunteerism was high, approximately 25% across all local municipalities. Informal sociability was at a similar level in all local municipalities. Surprisingly, the trust indicator was highly diversified and rose with the level of education.

On the grounds of the conducted descriptive analysis we have constructed a multivariate probit model, consisting of five equations—one for each dimension of social activity. This approach gave us more flexibility as to the choice of parameters and lifted restrictions regarding the correlation structure between dependent and independent variables. The set of independent variables was divided into two parts: one set common for all dimensions and the other set dimension-specific. All selected variables were firmly anchored in the economic theory.

Most social activity dimensions were interrelated which confirmed the accuracy of the chosen empirical framework. In the last step we generated a single, synthetic measure of social capital based on the multivariate probit model estimates and we plugged it into an individual's and household production function. Human capital turned out to explain approximately 50% of income variation at individual level. One third of income variation was attributed to physical capital and the remaining 20% to social capital. Similar results were obtained at household level, with a slightly lower share attributed to social capital (ca. 15%). Overall, social capital constituted a significant and unneglectable determinant of income.

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A b s t r a c t **Impact of Social Capital on Income**

In this paper we attempt to quantify the impact of social capital on income. We follow Putnam's [1995] approach and we construct a synthetic index for social capital using a multivariate probit model. Social capital is considered as one of the crucial individual endowments, next to physical and human capital. In a second step, we estimate the impact of the synthetically constructed social capital index on an individual's income using a Mincer-type earnings equation. The results show that social capital explains up to 20% of income variation both at the individual and household level. However, human capital and physical capital remain the critical determinants of individual income.

Keywords: social capital, income, well-being, local community, household

JEL classification: A14, 018