



THE AFRICAN CAPACITY
BUILDING FOUNDATION

FONDATION POUR LE RENFORCEMENT
DES CAPACITES EN AFRIQUE

Social Capital and Poverty: Evidence from Senegal

Barassou Diawara,
Knowledge and Learning Department
The African Capacity Building Foundation

Background paper originally presented at the Japanese Association for Applied Economics (JAEE) Conference, November 17th-18th 2012, Meikai University, Japan

The Knowledge and Learning Department

Social Capital and Poverty: Evidence from Senegal

Barassou Diawara

Knowledge and Learning Department, The African Capacity Building Foundation (ACBF)

2 FAIRBAIRN DRIVE, Mt Pleasant

Harare, ZIMBABWE

Email: b.diawara@acbf-pact.org

(23rd May 2013)

Abstract

Social capital has been described as an empirically elusive concept, yet has also been heralded as the glue that holds communities together. The objective of this paper is to show that associational relationships, social norms and cohesion are important in partly explaining the poverty status of the household heads in Senegal. We make use of the 2005 Senegalese Household Survey to construct an index of social capital and show that it is correlated with the economic situation of the households. The instrumental variables estimations suggest that social capital has an impact on poverty. Besides, after disaggregating our sample based on the gender and location of the household head, our results still show the evidence that household heads with more social capital are less likely to be poor. The findings of this study support recent emphasis by international community and specialists of development economics on investing in social capital.

JEL Codes: I30, O10, R20

Keywords: Social capital, poverty, probit, instrumental variables, Senegal

1. Introduction

During the last two decades the concept of social capital is being actively popularized by scholars, namely economists, sociologists and political scientists (González-Arangüena *et al.*, 2011). The notion is seen as an important factor explaining the development level of the nations, the wealth of individuals and households and welfare of communities (Narayan and Pritchett, 1999). As an illustration it is to be recognized that the World Bank (1998) has acknowledged social capital as a useful tool for poverty reduction. Through its “Social Capital Initiative”¹ launched in 1996, the Bank has also shown the importance given to the concept of social capital. Furthermore, in 2002, the *Journal of African Economies* has dedicated a special issue² to the concept of social capital to show the importance and provoke economists to explore the related issues in much detail.

Social capital lends itself to multiple definitions, interpretations, and uses. The definition and measurement of social capital are still not unanimous (Grochowska and Strawiński, 2010). According to the World Bank, social capital refers to the “institutions, relationships and norms that shape the quality and quantity of a society’s social interactions”³. It is generally seen as a multidimensional concept incorporating different levels and units of analysis.

Though used in numerous studies since the late 1970s, Woolcock (1998) has argued that the most extensive empirical research and coherent theoretical advances on “social capital” have come in the late 1980s and 1990s. To date a couple of studies investigating the impact of social capital on the efficiency and sustainability of development programs have been done. Besides, various studies have paid attention to the measurement and definition of the concept of social capital. This is out of the scope of the present research. This research focuses on the role of social capital in the welfare of individuals and households. Such approach, although not the first⁴, examines the impact of social capital on the expenditures capabilities and poverty status of household heads.

Empirical studies on the relationship between social capital and poverty (or economic outcomes) have been conducted at the macro and micro levels. For macro related studies, Knack and Keefer (1997) have shown that social capital proxied by civil and political liberties, civil community and trust has significant impacts on aggregate economic activity. Investigations at the micro level are relatively trickier because of the lack of proper data reflecting social capital. Empirical examinations at the individual or household levels are still ongoing and represent a relatively new area of research. For example, Putnam *et al.* (1993), in a seminal study, have

¹ See Grootaert and van Bastelaer (2002) for a synthesis of the findings and recommendations from the Social Capital Initiative.

² See the *Journal of African Economies*, Volume 11, number 1.

³ <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTT> [Accessed July 28, 2012]

⁴ The World Bank has conducted studies for countries such as Tanzania, Indonesia, Bolivia and Burkina Faso (Grootaert and van Bastelaer, 2002).

shown that communities with high levels of social capital are found to be more prosperous than communities with low levels of social capital. Using the log of per capital consumption expenditure as measure of economic welfare, Narayan and Pritchett (1999) and Grootaert (1999) have provided evidence that, controlling for a set of individual and community characteristics, social capital leads to higher household welfare.

Although the literature on social capital has attempted to demonstrate the importance of social capital, it is to be recognized that it has not yet amply proven whether social capital helps the poor (Grootaert, 1999; p. 7). To our knowledge, there is no systematic study on the poverty effects of social capital in Senegal. This study is a first attempt. Using data from the “Enquête de Suivi de la Pauvreté au Sénégal” named ESPS-2005 (ESPS, 2005), the impacts of social capital on the poverty status of the households are estimated. In fact, Senegal is a useful study case because it is fairly representative of other moderately open, low income economies with relatively few natural resources.

The objective of this paper is to investigate the impact of social capital on the poverty status of households. Conducting such research is important because it can contribute to the debate on the impacts of social capital on household welfare in the sense that Grootaert (1999, p. 65) has acknowledged the necessity for future research to confirm the findings of studies conducted under the Social Capital Initiative. Besides, Narayan and Pritchett (1999)’s remarkable result that in Tanzania social capital matters more for household welfare than human capital constitutes a challenge to investigate this issue for other countries and assess how general this finding is. In addition, this study investigates the impact of social capital for female and male headed household and for the rural and urban households.

The remaining of the paper is structured as follows. Section 2 introduces the definitions and measurements of the concepts of social capital and poverty. In section 3, the channels through which social capital affects the welfare of the individuals and therefore their poverty status are described. Section 4 gives a brief review of the literature on the relationship between social capital and poverty (or welfare). Section 5 presents the econometric model and data used in the empirical analyses. Sections 6 and 7 show the empirical results while the last section concludes the paper.

2. Conceptual framework

2.1. On the concept of social capital

(1) Definition

Social capital has been given many definitions arising from the lack of conceptual clarity. However, it is to be noted that although the definitions vary the concept is generally understood to be a social resource created through formal and informal relationships between people

whether through individual, family, neighborhood or community related interactions. We however can classify the definitions depending on whether the concept is considered in the context of macro level analysis or in the micro level studies⁵.

At the macro level, social capital includes institutions such as governance, civil and economic liberty and the rule of law. Knack (1999) has surveyed the macro literature on social capital, and adopting the definition of Collier (1998), he has classified the concept into ‘government social capital’ and ‘civic social capital’. The former stands for governmental institutions that influence people’s ability to cooperate for mutual benefit. Knack (1999), for example, has analyzed variables such as the enforceability of contracts, the rule of law, and the extent of civil liberties that are permitted by the state. ‘Civil social capital’ refers to common values, norms, informal networks, and associational memberships affecting the ability of individuals to work together to achieve common goals. At the micro level, social capital refers to the networks and norms that govern interactions among individuals, households and communities.

International organizations have also adopted their own definitions of the concept of social capital. For example, the World Bank (1999) considers that “social capital is not just the sum of the institutions which underpin a society—it is the glue that holds them together”. In addition, the OECD (2001) defines social capital as “networks, together with shared norms, values and understandings which facilitate cooperation within or among groups”.

(2) Measurements

There is considerable debate and controversy over the measurement of social capital. The World Bank has been attempting to propose a harmonized measure of social capital while individual researchers have also been giving their own measurements (World Bank, 2004; Narayan and Pritchett, 1999; Putnam, 1995; Roslan *et al.*, 2010). The search for a universal measure still continues. Measurements therefore depend on the assumptions made and the availability of socio-economic variables.

Putnam (1995), a pioneer on the research on social capital, has proposed an important approach distinguishing five components of social capital namely the community organizational life, the engagements in public affairs, the community volunteerism, the informal sociability and the trust. Variables considered as measures for the community organizational life are serving on the committee of a local organization, serving in office for a club or organization, the number of civic and social organizations per one thousand inhabitants, the mean number of club meetings attended during a year, and the mean number of group memberships. Proxies considered for

⁵ It is also common to classify social capital into “bonding” social capital (ties to people who are similar in many aspects or characteristics), “bridging” social capital (i.e. ties to people who do not share many characteristics) and “linking” social capital (ties to people in position of authority). See Grooatert et al. (2004).

engagements in public affairs are the turnout in presidential election and the participation in public meeting on town or school affairs. As a measure of community volunteerism, Putnam (1995) has taken into account the number of non-profit organizations per one thousand inhabitants, the mean number of times worked on community project and the mean number of volunteer placements during a year. Spending a lot of time visiting friends and the mean number of times entertained at home during the last year are proposed as measures of informal sociability. With respect to trust, Putnam (1995) suggests the susceptibility to trust others and the belief that most people are honest.

Grootaert et al. (2002) have focused on seven aspects to capture social capital. The variables considered and used as proxies of social capital are (1) the number of memberships in associations, (2) the degree of heterogeneity of the group, (3) the meeting attendance, (4) the index of participation, (5) the degree of informality of the association, (6) the community initiation and (7) the cash contribution score and work contribution score. Isham (2002) has taken into consideration group homogeneity, participatory norms and leadership heterogeneity as measurements of social capital.

The World Bank, through the Integrated Questionnaire for the Measurement of Social Capital (SC-IQ), has proposed to measure social capital via six broad sections namely groups and networks, trust and solidarity, collective action and cooperation, information and communication, social cohesion and inclusion and empowerment and political action (Grootaert et al., 2004). The same indicators have been used by, among others, Roslan et al. (2010).

It is clear that social capital has been measured in a variety of innovative ways. However, it is to be noted that obtaining a single, consensual and true measure is probably not possible (Woolcock and Narayan, 2000). Therefore, this paper attempts to contribute to the debate.

2.2. On the concept of poverty

(1) Definition

Poverty is a contested concept, and there is no agreement on how to define the word more precisely. Depending on the societies and changes overtime, the perceptions, contexts, meanings and usages may differ among the observers and researchers. For example, the World Bank (2001, p. 15) defines poverty as a “pronounced deprivation in wellbeing”. Well-being is usually defined through three approaches, namely the monetary, basic needs and capabilities approaches. The monetary approach views poverty as a situation where households or individuals do not have enough resources to meet their needs while the basic needs approach of well-being considers poverty as associated with certain type of consumption good. The capabilities approach of poverty arises when people lack key capabilities, meaning they have inadequate income or education and training, or poor health, or insecurity, or low self-confidence, or a sense of powerlessness, or the absence of rights such as freedom of speech.

The definition of the United Nations is mainly inspired by Sen (1987) and has been the base of the development of various poverty indexes. It has been extensively used for international comparison purposes. Fundamentally, poverty is a “denial of choices and opportunities for a tolerable life” (UNDP, 1997; p. 5), a violation of human dignity. It means lack of basic capacity to participate effectively in society.

It is also to be noted that various other organizations (African Development Bank, Asian Development Bank, etc) as well as individual countries use to adopt their own definition of poverty which is basically similar to the definition of international organizations such as the World Bank and the United Nations. Besides, the definitions may also differ depending on the perception of the people. For example, in Senegal, “a poor person is somebody who has nothing, who cannot meet his basic needs and who lives without access to opportunities” (DPS, 2002; p. 15)⁶.

(2) Measurements

The most used measures of poverty are the headcount poverty, the poverty gap and the poverty severity. The headcount poverty (P_0) which measures the incidence of poverty by computing the proportion of the population living in households with per capita consumption below the poverty line is defined as follows:

$$P_0 = \frac{N_p}{N} = \frac{1}{N} \sum_{i=1}^N I(y_i < z) \quad (1)$$

where:

N_p and N are the number of poor and the total of the population, respectively;

$I(.)$ is an indicator function that takes on a value of 1 if the bracketed inequality is true and 0 otherwise;

y_i is the expenditure and;

z represents the poverty line.

The poverty gap index (P_1) measures the depth of poverty in a country or region, based on the aggregate poverty deficit of the poor relative to the poverty line. The index is expressed as follows:

$$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{(z - y_i) * I(y_i < z)}{z} \quad (2)$$

⁶ Although various definitions of poverty exist, to better understand the nature of poverty, practitioners and researchers employ several related poverty concepts. These include, among others, absolute and relative poverty, subjective and objective poverty, public and private poverty, chronic and transitory poverty, and extreme and moderate poverty.

The poverty severity index (P_2) is defined as the mean of the squared proportionate poverty gap. The poverty severity is calculated as follows:

$$P_2 = \frac{1}{N} \sum_{i=1}^N \left[\frac{(z - y_i) * I(y_i < z)}{z} \right]^2 \quad (3)$$

Other measures of poverty exist; for example, the Sen index, the Sen-Shorrocks-Thon index and the Watts index (See Haughton and Khandker, 2009). However, for simplicity and because the main objective of the present study is not to estimate the poverty figures, we focus on the headcount index which is one of our main dependent variables.

3. Linking social capital to household welfare

Narayan and Pritchett (1999) have summarized the five mechanisms through which social capital can affect outcomes as suggested by the literature on the impacts of social capital on welfare.

(1) Public sector efficacy

This idea stems from the seminal work of Putnam et al. (1993). The analyses have shown that the regions of Italy in which the population had a greater degree of horizontal connections had more efficacious governments. The results have put into evidence that there is a close relationship between the number of voluntary associations and the efficacy of the regional government. The implication is that monitoring the performance of a government is facilitated by greater social capital.

(2) Direct provision of services

This idea refers to the management of resources that are treated as common property such as improved water supplies, local irrigations capabilities and local roads. The role of social capital (for example, group or community cooperative) in solving local problems is particularly important. Narayan and Pritchett (1999) have documented that social capital may facilitate greater cooperation in the direct provision of services that benefit all members of the community. For example, in Tanzania, villages with more social capital were more likely to have had community road-building activities.

(3) Diffusion of innovations

Greater linkages among individuals can facilitate the diffusion of innovations. For example, Isham (2002) has shown that households living in the Plains of Tanzania are more likely to have adopted fertilizer in the presence of social capital (mainly participatory norm i.e. the degree to which local customs promote interactive decision-making). In rural Tanzania, there is a greater likelihood that households located in villages with larger social capital have used fertilizer, agrochemical inputs or improved seeds (Narayan and Pritchett, 1999).

(4) Sharing of information among members

Participating in social networks increases the availability of information and lowers its cost. This can therefore lead to higher returns or profits if the information is, for instance, related to the prices of crop, the sources of credits, etc (Grootaert et al., 2002). In the same line, Narayan and Pritchett (1999) have also acknowledged that greater associational activity can lead to less imperfect information and therefore lower transaction costs and greater range of market transactions.

(5) Reduction of opportunistic behavior and improved collective decision making

Participation in networks and attitudes of mutual trust reduces the opportunistic behavior by community members. Individuals are therefore prone to defend the interest of the group. For example, such situation can be described by the mutual pressures in the case of rotating credits. In addition, participating in social networks makes it easier to reach collective decisions and implement collective action mainly because of the high level of trust (see Narayan and Pritchett, 1999).

4. Social capital and welfare: brief review of the literature

Studies on the relationship between social capital and household welfare have started to be systematic and quantifiable with the Social Capital Initiative initiated by the World Bank and under which papers by, among others, Narayan and Pritchett (1999), Grootaert and Narayan (2004), Grootaert (1999) and Grootaert et al. (2002) have been produced. The literature can therefore be classified into studies related to the World Bank project and those not related. However, we have adopted another classification constituting of studies related to developed countries and those done for developing countries⁷.

(1) Studies related to developed countries

Putnam is considered as the pioneer in the studies related to social capital. In fact, since the publication of his book (Putnam et al., 1993), ‘social capital’ has become one of the key terms extensively used by international organizations, national governments and development partners. Putnam has made use of surveys, interviews and a diverse set of policy indicators to examine the institutional performance of twenty Italian regional governments. The main finding is that wide variations in the performance of governments are closely related to the vibrancy of associational life in each region. In fact, the density of associations explains the difference in economic performance between North and South Italy. For example, the findings show that, in northern Italy, where the population participates actively in sports clubs, literary guilds, service groups and choral societies, regional governments are “efficient in their internal operation,

⁷ Adopting the classification ‘developed vs. developing countries’ can help to capture the main studies conducted and put into evidence the different results which might be different depending on whether the country into consideration is a developed or developing country.

creative in their policy initiatives and effective in implementing those initiatives” (Putnam et al., 1993; p. 81). By opposite, in southern Italy where patterns of civic and associational engagement are weaker, regional governments tend to be corrupt and inefficient. With respect to the relationship between social capital and economic performance, Putnam et al. (1993) have shown that the levels of social capital at the turn of the century account greatly for today's levels of economic development.

Following the works of Punam (Putnam et al., 1993), various studies have been conducted to ensure the role of social capital on welfare. Grochowska and Strawiński (2010) have examined the impact of social capital on individual wellbeing in Poland. They have used five dimensions of social capital namely organization membership, participation in local elections, volunteer behavior, size of social network and trust to construct a social capital index. The main difference with other studies is that they have considered a Mincer earning function. The findings have shown that social capital explains approximately 20% of income variation both at individual and household level, suggesting that social capital is a significant and unneglectable determinant of income. It is however to be noted that social capital does not have the highest impact as shown by some studies in developing countries (Grootaert et al., 2002). The positive and statistically significant coefficient for the social activity proxy indicates that there is a positive influence of social capital on personal income meaning that the more active a person is, the higher the wage premium he or she receives. At the opposite of Grochowska and Strawiński (2010), Kuroki (2011) has attempted to adopt a different perspective by looking at the role of social capital on happiness (not on income).

Kuroki (2011) has taken Japan as a case study to investigate whether social capital can increase individual happiness. He has proxied social capital through the variable ‘trust’. The individual subjective happiness (degree of happiness) is used as an indicator of wellbeing. After controlling for the possible endogeneity of the main independent variable (trust), the results have shown that social trust is positively and significantly associated with human welfare, suggesting that there is a causal relationship running from social capital to happiness. In particular, the findings have shown that the effect of social trust may depend on the beliefs that people have about trustworthiness of others. Furthermore, additional tests have suggested heterogeneous effects of social trust meaning that trustworthy environments do not necessarily benefit everyone. For example, the empirical evidence has indicated that trust-neutral individuals benefit from social trust in their area of resident while non-trusting one do not.

Empirical results on the relationship between social capital and welfare are almost unanimous in the case of developed countries: social capital plays a significant role in the generation of income and is correlated with household welfare. Can the same findings be verified in developing countries?

(2) Studies conducted in developing countries

Narayan and Pritchett (1999) have used the Social Capital and Poverty Survey (SCPS) to investigate the relationship between social capital and household welfare in rural Tanzania. The indicators of social capital used are the degree and characteristics of associational activity and trust among households. The various dimensions of social capital are used to construct an index of social capital. The results have shown that a one standard-deviation increase in the village social capital index is associated with at least 20% higher expenditures per person in each household in the village. The findings have witnessed that the effects of social capital on income (income and expenditure are used interchangeably) are relatively larger in comparison with other types of assets such as human and physical capital. Furthermore, Narayan and Pritchett (1999) have also documented the causal mechanisms through which social capital affects household welfare. The channels considered are better public services, use of advanced agricultural practices, membership in communal activities and use of credit for agricultural improvements. Similar study in the framework of the same project has also been conducted in Indonesia (Grootaert, 1999), Burkina Faso (Grootaert et al., 2002) and Bolivia (Grootaert and Narayan, 2004).

Grootaert (1999) has tried to estimate the impact of social capital on household welfare and poverty in Indonesia. At the opposite of Narayan and Pritchett (1999), Grootaert (1999) has looked at separately the impacts of the social capital index and each dimension of the social capital. The dimensions taken into account are the density of associations, their internal heterogeneity, the frequency of meeting attendance, the members' effective participation in decision making, the payment of dues (in cash and in kind) and the community orientation of associations. The empirical findings have shown that social capital index is positively and significantly associated with the household expenditure per capita and that the returns to the household are similar in magnitude to those from human capital. Furthermore, the additional tests on the disaggregated social capital dimensions have shown that the strongest effects were found to come from the number of memberships, the internal heterogeneity and the active participation in decision-making. Besides, Grootaert (1999) has also shown that social capital reduces the probability of being poor and the returns to household investment in social capital are higher for the poor than for the population at large. This evidence is especially true for the number of memberships and households' active participation in decision making. Similar findings have been found for the case of Burkina Faso, a landlocked country in West Africa (Grootaert et al., 2002).

Grootaert et al. (2002) have used the case of Burkina Faso to empirically investigate the importance of social capital for the welfare of rural households. The measures of social capital considered are the membership in local association and networks. An instrumental variable estimation has been used to control the endogeneity of social capital. The results have shown

that a 5% increase in the endowment of social capital leads to an increase of 2.7% in the household expenditure per capita making the effect larger than that of human capital. The findings have indicated that social capital reduces the probability of being poor and the returns to household investment in social capital are higher for the poor than for the population at large. Similar results have also been found by Narayan and Pritchett (1999) in rural Tanzania.

Grootaert and Narayan (2004) have explored the linkages between social capital and household welfare and poverty in Bolivia. The social capital index is constructed using six dimensions namely the density in membership in agrarian syndicates, the degree of heterogeneity, the meeting attendance, the active participation index, the membership dues and the community orientation. The results have shown that local social capital makes a significant contribution to household welfare, over and above that stemming from human capital and other household assets. In addition, the findings have indicated that social capital reduces the probability to be poor and the returns to household investment in social capital are generally higher for the poor than for the rich. It is however to be noted that the dimension of social capital in play differs among the four study zones considered. For example, in Villa Serrano and Charagua where the institutional tradition is weaker, Grootaert and Narayan (2004) have found that there is a significant impact of membership both in agrarian syndicates and other associations on household welfare. Besides the studies under the auspices of the World Bank, individual researchers have attempted to contribute to the debate; that is the case of authors such as Roslan et al. (2010).

Roslan et al. (2010) have used primary data, collected from a sample of 2500 households in rural Malaysia to investigate the relationship between social capital and poverty. They have employed the same dimensions of social capital as in Grootaert et al. (2004) to construct an index of social capital. The empirical results have shown that social capital has a negative and significant effect on the probability of being poor. Therefore, the findings imply that, *ceteris paribus*, a unit increase in social capital will decrease the probability of household being poor by about 0.0129.

Two lessons emerge from the literature. First, it is evident from the literature that social capital plays an important role in the household generation of income. For example, besides directly affecting the household welfare, social capital can help in increasing the access to credit, fostering the adoption and diffusion of new technologies, leading thereafter to higher welfare. Second, empirical studies are still relatively scarce and there is no unanimity on the instruments used to measure social capital. To our knowledge, this is the first study to examine the relationship between social capital and welfare in Senegal. Besides attempting to fill such gap, this study also tries to contribute to the debate related to the measurement of social capital in developing countries.

5. Methodological issues and data

5.1. Aggregate model

This study has benefited from the analytical framework applied earlier by Narayan and Pritchett, (1999), Grootaert et al. (2002) and Grootaert (1999, 2001). The main idea behind such framework is that social capital is viewed as one class of assets available to households for generating income and making consumption possible. A conventional model of household economic behavior under constrained utility maximization is used to relate the level of household expenditure directly to the exogenous asset endowments of the household and variables describing the social and economic environment in which the household makes decisions. The model is formalized as follows:

$$\ln E_i = \alpha + \beta SC_i + \gamma HC_i + \delta OC_i + \theta X_i + \mu Z_i + \varepsilon_i \quad (4)$$

where:

- E_i is the household expenditure per capita of household i ;
- SC_i , HC_i and OC_i represent the household endowment of social capital, human capital and other assets, respectively;
- X_i stands for a vector of household characteristics;
- Z_i means a vector of region characteristics; and
- ε_i is an error term.

Model (4) is mainly characterized by the basic assumption that social capital is, like human and physical capital, ‘capital’ meaning that it is a stock which generates a measurable return to the household (Grootaert, 1999). We can note with previous literature that social capital has many features of ‘capital’. For instance, it requires resources (namely time) to be produced and is subject to accumulation and destruction. Besides, social capital can be acquired in formal and informal settings just like human capital. Much social capital is also built through interactions that occur for religious, cultural or social reasons.

In the above specification and following the previous literature, it is hypothesized that SC_i , HC_i and OC_i would have a positive relationship with the natural logarithm of the household per capita expenditure. Therefore social capital, human capital and the other assets are expected to be poverty reducing in the sense that they are supposed to contribute to an increase in household income. A priori, the sign of the vectors X_i and Z_i cannot be determined due to the fact that each is constituted of various variables presented in the next sub-section. The variables consist of the demographic control variables, the locational dummy variables and the household characteristics variables.

5.2. Data source and variables definition

The study relies on the 2005 Senegalese Household Survey known as ESPS-2005 (Enquête de Suivi de la Pauvreté au Sénégal; ESPS, 2005). Data were collected for the whole country and covered 13600 households in the 11 regions of Senegal⁸, i.e. 8564 in the urban area and 5036 in rural area. The ESPS-2005 is the first survey conducted in the framework of the global program for monitoring and assessing the poverty reduction strategies. It aims at devising relevant and easy-to-collect indicators for a regular appraisal of poverty reduction in Senegal. The information collected is related to education, health, employment, household assets, access to basic community services, public opinion vis-à-vis life conditions and expectations from the government. The data also relate to the priorities and solutions for poverty reduction as well as the population's perception of the institutions. The survey consequently provides a large series of variables permitting the estimation of various valuable indicators at different geographical levels for different social categories (ESPS, 2005).

Most of the variables used in this study are all self-explanatory and do not need much explanation. In the basic econometric specification (4), the dependent variable considered is the natural logarithm of the household per capita expenditure. It was considered in previous studies (see for example, Narayan and Pritchett, 1999; Grootaert et al., 2002 and Grootaert, 1999; 2001).

Our main explanatory variable considered is the social capital index. It is constructed following Grootaert et al. (2004) who have proposed to view social capital as being constituted of six dimensions namely (i) groups and networks, (ii) trust and solidarity, (iii) collective action and cooperation, (iv) information and communication, (v) social cohesion and inclusion and (vi) empowerment and political action. It is to be noted that our dataset does not have variables on the last dimension which is related to the empowerment and political action. Therefore, we have not considered such dimension in the construction of the social capital index. However, we believe that such shortcoming will not significantly bias our results⁹. All the items representing each domain are in the form of 'yes' or 'no' answer. A value of 1 is given to 'yes' answer while the value 0 is designated to 'no' answer. The social capital index is derived using the percentage of 'yes' answer and applying a linear transformation to get a 1-10 scale. Table 1 summarizes the dimensions of social capital considered and the respective items.

The other independent variables are the education status of the household head, the asset index, the age of the household head and its square, the gender of the household head, the marital status of the household head, the family size and the location of the household. The education variable is a dummy variable for whether the household head is educated or not; it is expected to be positively associated with the income. The asset index is constructed based on

⁸ Senegal had 11 regions the time the ESPS-2005 survey was conducted. There are now 14 regions.

⁹ Senegal has achieved a certain level of democracy with regular elections where most of the people vote.

the ownership of the following assets: flatiron, refrigerator, mattress, watch, sewing machine, cooking-range, bicycle, motorbike, car, tractor, plow, cart, canoe, electric fan, air conditioner, home phone, cellphone and computer. All the items representing each domain are in the form of ‘yes’ or ‘no’ answer. A value of 1 is given to ‘yes’ answer while the value 0 is designated to ‘no’ answer. The asset index is derived using a simple average. We follow Narayan and Pritchett (1999) at the difference that we did not assign different weights to ownership of the different assets.

Table 1. Social capital dimensions and related indicators

Dimension of social capital	Indicators considered
Groups and networks	(i) Membership in formal or informal association or organization (ii) Ability to get support from those other than family members and relatives in case of hardship
Trust and solidarity	(i) Most people in the community can be trusted (ii) Most people in the community always help each other
Collective action and cooperation	(i) More than half of the community contribute time or money toward common development goals (ii) High likelihood that people in the community cooperate to solve common problems
Information and communication	(i) Frequently listen to radio (ii) Frequently watch television.
Social cohesion and inclusion	(i) Strong feeling of togetherness within the community (ii) Feeling safe from crime and violence when alone at home.

Notes: The dimension ‘information and communication’ includes a third indicator called ‘frequently read newspaper’ which does not exist in the ESPS-2005 and is therefore not considered. Besides, the sixth dimension (empowerment and political action) is not shown in the table because the variable is not considered in the survey.

Source: Author’s own construction based on Grootaert et al. (2004)

The age of the household head and its square term are included to capture the nonlinear relationship between the age of the household head and the household welfare (Grootaert et al., 2002). Given that there might be constraints in the generation of incomes depending on whether the household head is female or male (Narayan and Pritchett, 1999; Grootaert et al., 2002), we include the dummy variable for female headed household to control such characteristic. A dummy variable is also included to take into account the heads of household residing in rural areas under the assumption that those households may face special constraints to income generation. Similarly, there might be some differences in incomes generation between married and non-married household heads justifying the inclusion of a dummy variable. The household size is included in the regressions to take into consideration the routinely observed negative relationship between household welfare and household size (Narayan and Pritchett, 1999).

Control variables in the regressions include the regional dummy variables. Eleven dummies for the regions (provinces) of Senegal are taken into consideration. The regions are Dakar (taken

as the base), Diourbel, Fatick, Kaolack, Kolda, Louga, Matam, Saint-Louis, Thies, Tambacounda and Ziguinchor. These variables capture the general economic and social conditions of the provinces along dimensions other than those which we were able to include in the model. See Table A.1 (Appendix) for the definition of the variables. Summary statistics of the variables considered in the regressions are presented in the Appendix (Table A.2).

5.3. Endogeneity of social capital

In estimating the above equation (4), the major problem is that social capital and household welfare are endogenous. Therefore, to be able to interpret the relationship between social capital and household welfare as being causal, it is necessary to solve the probable endogeneity of social capital. The endogeneity of social capital can be explained by the fact that the associational activities might not be random in the sense individuals choose who they want to associate with and what groups they want to join (Durlauf and Fafchamps, 2004).

Another source of endogeneity is coming from the fact that the formation of networks and associations can be costly in terms of time and other resources. Conceivably, therefore, households with higher income can devote more resources to network formation and thus acquire more social capital more easily (Grootaert et al., 2004).

The standard way to solve the endogeneity problem is to apply an instrumental variable (IV) estimation method which provides an empirical test of the extent of two-way causality. IV method uses the correlation between social capital and another variable (called the instrument) that is not determined by and does not determine welfare to estimate the effect of exogenous shifts in social capital on household welfare (Wooldridge, 2005). Such method has been used in past studies on the relationship between social capital and welfare (for example, Grootaert et al., 2002; Narayan and Pritchett, 1999; Kuroki, 2011). Narayan and Pritchett (1999) have used trust in strangers and trust in government officials as instrument for the group membership index (the index of social capital). The choice and validity of the instruments used have been criticized in the sense that it is argued that trust in either strangers or government officials is likely to have an independent effect on expenditure and therefore may not be a good instrument (Durlauf, 2002). Grootaert et al. (2002) have used trust, length of residency and trend in membership in associations as instruments for social capital at the household level. Grootaert (1999) has considered ethnic and religious diversity, density and effectiveness of institutions and involvement in the procurement of social services and infrastructure as suitable instruments for social capital.

It is to be recognized that the choice of a valid instrument is a difficult one and this is due to the absence of explicit modeling of the process by which groups are formed and social capital created and so a researcher is forced to rely on intuition and guesswork (Durlauf and Fachamps, 2004). In this study, we are guided by intuition and, given the availability of data, have chosen

the distance to the closest market, the distance to the closest public transport, the distance to the closest primary school, the distance to the closest secondary school and the distance to the closest telecentre¹⁰ as instruments for social capital. All the variables chosen as instruments have the particularity of fostering and encouraging interactions and exchanges among the individuals but are not directly related to the poverty status of the households. For example, there is no logic or evidence in the context of Senegal that poverty and closeness to a market, public transport, school or telecentre are significantly associated. In Senegal, the setting-up of markets, schools and transportation systems is not based on the welfare or poverty status of the household heads living in the area. In addition, we have also controlled various characteristics of the household heads to ensure that the instruments are not correlated with the unobservable variables that might be in the error term. Even though there might be certain issues associated with the above-mentioned instruments, the potential shortcomings may not significantly bias our empirical results.

6. Social capital and household welfare

In this section we present the results related to the relationship between social capital and household per capita expenditure. Regression (1) in Table 2 shows the results with respect to the association between social capital index and household per capita expenditure while regression (2) presents the findings when the five dimensions of social capital are introduced separately. Regression (3) attempts to solve the probable endogeneity problem associated with social capital using an instrumental variable estimation method.

Regression (1) shows that there is a positive and significant relationship between social capital and per capita expenditure. Higher levels of social capital and household per capita expenditure tend to be significantly correlated. Such a positive association is also observed in countries like Tanzania, Burkina Faso and Bolivia (Narayan and Pritchett, 1999; Grootaert et al., 2002 and Grootaert and Narayan, 2004). A look at equation (2) in Table 2 shows that the membership in organization or association, the trust in the people in the community, the contribution toward common development goals, the availability of television and the togetherness within the community might be the main mechanisms through which social capital affects the household per capita expenditure. In fact, the higher importance of ‘feeling of togetherness in the community’ can be well understood in the context of Senegal given the assistance of all types provided during the numerous ceremonies taking place in Senegal. Contributions received during the ceremonies remain a non-negligible part of the expenditures

¹⁰ Depending on the country, telecenter is also called public internet access center (PIAP), village knowledge center, infocenter, community technology center (CTC), community multimedia center (CMC), multipurpose community telecenter (MCT), Common/Citizen Service Centre (CSC) or school-based telecentre. It is recognized as a place where people can get access to internet, use computers and utilize other digital technologies.

of Senegalese households. Membership in organization or association is also equally important in the Senegalese society where the membership in a tontine for example constitutes a real source of income and helps the households to smooth their consumption expenditures especially in lean periods. It is however to be noted that we cannot affirm with certainty to as a causal relationship given that the social capital variable might be endogenous.

The other significant independent variables showing a positive correlation with per capita expenditure are the asset ownership index, the dummy variables for the education and the gender of the household head (regressions 1 and 2; Table 2). The asset ownership and the per capita expenditure are significantly correlated meaning that the higher the value of assets owned the higher the expenditure capabilities of the household heads or *vice versa* (because we do not have evidence on the existence of a causal relationship). The dummy variable for the educated households and the household expenditure per capita are positively and significantly associated implying that educated household heads are more likely to have higher per capita expenditure. A causal relationship is however not empirically demonstrated. Besides, regressions (1) and (2) also show that the female headed household and the household per capita expenditure are positively and statistically significantly correlated showing that female household heads are more spending-oriented comparatively to male headed households (Table 2). The results show that the dummy variable for married household heads and the household per capita expenditure are positively and significantly associated but the causal direction might be bidirectional in the sense that one may get married because of higher expenditure capabilities or because of ones' marital status one is obliged to spend more. Instrumental variable method can shed light on this issue.

Our empirical results show that there is a negative and significant relationship between the household per capita expenditure and the household size, on one hand, and the dummy variable for the households living in rural areas, on the other hand. Therefore, as expected, the larger the family size the lower is the household per capita expenditure. In addition, household living in rural areas, because of the fewer opportunities existing, may have lower household per capita expenditure. The results also show the lower expenditure capabilities of elder household heads. Besides, it is to be noted that the household heads living in the other regions of Senegal have lower household per capita expenditures respectively to the household heads living in Dakar, the capital.

The results of the instrumental variable estimation methods are presented in regression (3) of Table 2. The regressions results from the IV estimations are considered as our preferred estimates where we draw our main conclusions because they infer a causal relationship between social capital and household per capita expenditure. The IV results show that the social capital index has a positive and statistically significant impact on the household per capital expenditure indicating that household heads with higher social capital are more likely to have higher per

capita expenditure and therefore higher welfare. Thus, social capital through the associational activities, the trust in the members of the community and the feeling of togetherness may help the household heads gain higher levels of expenditure. Regression 3 in Table 2 shows that the dummy variable for the education of the household head, the dummy variable for household heads leaving in rural areas, the household size and all dummy variables for the different regions are still statistically significant. This finding does support Narayan and Pritchett (1999) on the fact the fact social capital has a causal effect on household welfare and that the estimated effect of social capital is substantially larger than the ordinary least squares estimates. The instrumental variables estimation used by Grooatert et al. (2002) has also led to similar conclusion regarding the causal effect of social capital.

Table 2. Social capital and household welfare

	(1)	(2)	(3)
	Simple OLS (social capital index)	Simple OLS (social capital disaggregated)	IV estimation (social capital index)
Social capital index	0.038***(0.004)		0.721***(0.114)
Membership in organization or association		0.035*(0.020)	
Support from others in case of hardship		0.007(0.010)	
Trust in the community		0.062***(0.009)	
Mutual assistance		0.003(0.010)	
Contribution towards common development goals		0.090***(0.023)	
Ownership of radio		-0.006(0.014)	
Ownership of television		0.026***(0.013)	
Feeling of togetherness in the community		0.140***(0.010)	
Safety		0.002(0.016)	
Asset index	0.111***(0.002)	0.110***(0.003)	-0.040(0.026)
Educated household head	0.033***(0.010)	0.028***(0.010)	0.036*(0.019)
Female household head	0.060***(0.013)	0.064***(0.013)	0.028(0.023)
Rural household head	-0.267***(0.010)	-0.266***(0.011)	-0.305***(0.020)
Household size	-0.044***(0.001)	-0.044***(0.001)	-0.043***(0.002)
Age of the household head	-0.009***(0.002)	-0.009***(0.002)	-0.000(0.003)
Squared age	0.000***(0.000)	0.000***(0.000)	-0.000(0.000)
Married household head	0.045***(0.015)	0.042***(0.015)	-0.001(0.026)
Diourbel	-0.310***(0.017)	-0.307***(0.017)	-0.384***(0.035)
Fatick	-0.342***(0.018)	-0.338***(0.018)	-0.739***(0.077)
Kaolack	-0.245***(0.016)	-0.229***(0.016)	-0.419***(0.043)
Kolda	-0.293***(0.018)	-0.296***(0.018)	-0.273***(0.033)
Louga	-0.474***(0.019)	-0.461***(0.019)	-0.440***(0.032)
Matam	-0.135***(0.019)	-0.134***(0.019)	-0.326***(0.048)
Saint-Louis	0.060***(0.021)	0.078***(0.021)	-0.368***(0.082)
Tamba	-0.343***(0.020)	-0.334***(0.021)	-0.393***(0.036)
Thies	-0.209***(0.016)	-0.210***(0.016)	-0.076***(0.038)
Ziguinchor	-0.428***(0.019)	-0.435***(0.019)	-0.283***(0.042)
Constant	6.809***(0.051)	6.835***(0.055)	4.093***(0.464)
Observations	12,640	12,640	12,640
R-squared	0.518	0.524	

Notes: The dependent variable is the household expenditure per capita; Dakar is taken as a base group for the regional dummy variables. Standard errors are in the parentheses. *, ** and *** represent the significance at 10%, 5% and 1% respectively.

In clear terms, the analyses, so far, have shown that social capital has positive and significant effects on household welfare. However, it is rational and necessary to see whether social capital helps the poor escape from poverty and whether it is worth investing on it to reduce poverty in Senegal. The next section addresses this issue by estimating the impact of social capital on the probability of being poor.

7. Social capital and household poverty status

7.1. Results from the probit regressions

Table 3 presents the results of the estimations with respect to the impact of social capital on the probability of being poor, controlling for household characteristics and regional specificities. Regression (1) is related to the social capital index, regression (2) shows the results with the separate dimensions of social capital and regression (3) presents the instrumental variables regressions with the social capital index (Table 3). It is to be noted that regression (3) is considered as our preferred results.

Regression (1) shows that the social capital index and the poverty status of the household heads are negatively and significantly associated. We can presume a causal link running from social capital to poverty given that the estimated coefficient is significant when conducting the IV estimations. Therefore, the higher the social capital index the lower is the probability of being poor meaning that household heads with higher social capital are less likely to be poor. Table 8 presents the marginal effects generated after the IV estimates and shows that a one point increase in the social capital index of a given household head leads to a decrease in the probability of being poor by approximately 0.913. The poverty reduction effects of social capital may work through the channels described in the literature (Woolcock, 1998) and in the context of Senegal via the trust in community, the contribution towards common development goals, the importance of information and the feeling of togetherness in the community. However, the channels through which social capital affects the probability of being remain an empirical question to be investigated. The significant impact of social capital on the probability of being poor found in case of Senegal has also been empirically shown by Grootaert (1999) for Indonesia.

Based on our preferred estimation results, regression (3) in Table 3 shows that the dummy variable for female headed households and the probability of being poor are negatively and statistically significantly associated suggesting that female headed households are less likely to be poor. This result might not be in line with the traditional view according to which male headed households are more likely to be rich because given more opportunities comparatively to women. The finding can be explained by the different policies directed toward the promotion and empowerment of women. Opposite result concerning the association between female headed household and probability of being poor has been found in Grootaert et al. (2002) for the

case of Burkina Faso. As expected, the dummy variable for rural households and the probability of being poor are positively and significantly correlated suggesting that household heads living in rural areas are more likely to be poor. This might be due to the relatively few opportunities existing, the lower education levels and low productivity in rural areas.

The results in regression (3) also show that, as expected, the household size and the probability of being poor are positively and significantly associated showing the burden associated with having many family members that are, in most of the cases, dependent on the head of the household who is the main breadwinner. A positive relationship between the household size and the probability of being poor has also been found by Grootaert et al. (2002) in Burkina Faso.

Table 3. Social capital and poverty status, full sample

	(1)	(2)	(3)
	Probit (social capital index)	Probit (social capital disaggregated)	IV probit estimation (social capital index)
Social capital index	-0.094***(0.012)		-1.670***(0.287)
Membership in organization or association		-0.006(0.069)	
Support from others in case of hardship		-0.031(0.030)	
Trust in the community		-0.150***(0.029)	
Mutual assistance		-0.020(0.031)	
Contribution towards common development goals		-0.175***(0.063)	
Ownership of radio set		0.043(0.037)	
Ownership of television set		-0.126***(0.041)	
Feeling of togetherness in the community		-0.351***(0.034)	
Safety		-0.027(0.051)	
Asset index	-0.249***(0.007)	-0.248***(0.009)	0.096(0.064)
Educated household head	-0.021(0.032)	-0.008(0.032)	-0.025(0.049)
Female household head	-0.269***(0.039)	-0.273***(0.039)	-0.195***(0.060)
Rural household head	0.169***(0.029)	0.158***(0.030)	0.256***(0.048)
Household size	0.099***(0.003)	0.100***(0.003)	0.098***(0.004)
Age of the household head	0.021***(0.005)	0.021***(0.005)	0.002(0.008)
Squared age	-0.000***(0.000)	-0.000***(0.000)	0.000(0.000)
Married household head	-0.182***(0.042)	-0.177***(0.042)	-0.080(0.067)
Diourbel	0.095*(0.057)	0.085(0.058)	0.261***(0.093)
Fatick	0.131**(0.058)	0.110*(0.059)	1.043***(0.188)
Kaolack	-0.068(0.058)	-0.123**(0.058)	0.326***(0.114)
Kolda	0.091(0.058)	0.083(0.059)	0.037(0.089)
Louga	0.364***(0.057)	0.327***(0.058)	0.282***(0.089)
Matam	-0.330***(0.060)	-0.345***(0.060)	0.103(0.121)
Saint-Louis	-0.787***(0.070)	-0.839***(0.071)	0.184(0.206)
Tamba	0.012(0.058)	-0.011(0.059)	0.123(0.091)
Thies	-0.242***(0.059)	-0.242***(0.060)	-0.554***(0.105)
Ziguinchor	0.286***(0.058)	0.295***(0.059)	-0.056(0.108)
Constant	0.061(0.145)	-0.047(0.153)	6.319***(1.159)
Observations	12,640	12,640	12,640
R2	0.252	0.257	
Wald test of exogeneity (Chi-2)			73.87***
Validity of instruments (Amemiya-Lee-Newey Chi-2)			7.235
Joint significance of the instruments (F-test)			10.37***

Notes: The dependent variable is the headcount poverty; Dakar is taken as a base group for the regional dummy variables. Standard errors are in the parentheses. *, ** and *** represent the significance at 10%, 5% and 1% respectively.

With respect to the locational dummy variables, the case of Thies needs some comments and explanations because the dummy variable for the region in question has shown a negative and significant relationship with the probability of being poor. This means that comparatively to the capital, Dakar which is taken as a comparative group, household heads living in Thies are less likely to be poor. It might be tricky to explain such result. However, it is needed to be recognized that in recent years, especially since 2000, Thies has become an economically important zone leading in the sector of fishery and tourism considered as the first pillars of the Senegalese economy. In 2005, the region of Thies has provided 65.8% of the unloading of fish followed by Dakar with 12.6%. During the same year also, Thies remains the leader in terms of receipts of the sales of fishery with 45.6% against 29.6% for the region of Dakar (ANSD, 2006). Moreover, ANSD (2006) has also shown that Thies represents an important touristic zone with 43.4% of the overnight stays while Dakar follows with 40.5% of the overnight stays in 2005.

7.2. Results from the disaggregated samples

(1) Disaggregation by gender

Table 4 and Table 5 present the empirical results related to the impact of social capital on the probability of being poor for male headed households and female headed households respectively.

Table 4 shows that the social capital index and the probability of being poor for male headed households are negatively and significantly associated. Looking at the separate social capital dimensions, the results show that trust in the community, contribution towards common development goals and feeling of togetherness in the community are the dimensions of social capital having a significant relationship with the poverty status of male headed households (regression 2, Table 4). However, it is not possible to draw a causal relationship given the probable endogeneity problem associated with the variable ‘social capital index’. Regression (3) in Table 4 presents the results of the IV estimations; they are consistent with our previous finding. Social capital has a negative and statistically significant impact on the probability of being poor. For the sample of male headed households as well, those with higher social capital are less likely to be poor. Table 8 (regression 2) shows that the marginal effects for the case of male headed households is 0.902, implying that an increase of the social capital index by one unit reduces the probability of being poor by the above-mentioned value.

A close look at our preferred estimation results (regression 3) in Table 4 confirms the significant and negative relationship between the male headed poverty status, on one hand, and the dummy variable for the rural household heads and household size, on the other hand. The sample of male headed households again corroborates the results shown by the aggregate sample with respect to the positive association between the dummy variable for household heads living in rural areas and their poverty status. Thus, those living in rural areas might be

more likely to be poor comparatively to the households living in urban areas mainly because of the opportunities given to the latter. Besides, the negative side of families of large size can be predictable through the positive and significant coefficient associated with the variable 'household size'.

Table 4. Social capital and poverty status of male headed households

	(1)	(2)	(3)
	Probit (social capital index)	Probit (social capital disaggregated)	IV probit estimation (social capital index)
Social capital index	-0.122***(0.029)		-1.605***(0.289)
Membership in organization or association		-0.113(0.172)	
Support from others in case of hardship		0.043(0.069)	
Trust in the community		-0.189***(0.069)	
Mutual assistance		-0.081(0.076)	
Contribution towards common development goals		-0.376***(0.113)	
Ownership of radio set		-0.077(0.081)	
Ownership of television set		-0.033(0.094)	
Feeling of togetherness in the community		-0.436***(0.081)	
Safety		0.074(0.111)	
Asset index	-0.271***(0.016)	-0.275***(0.022)	0.081(0.063)
Educated household head	0.032(0.078)	0.047(0.079)	-0.007(0.054)
Rural household head	-0.015(0.074)	-0.021(0.075)	0.244***(0.050)
Household size	0.134***(0.007)	0.137***(0.007)	0.092***(0.004)
Age of the household head	0.023***(0.011)	0.024***(0.011)	-0.003(0.010)
Squared age	-0.000***(0.000)	-0.000***(0.000)	0.000(0.000)
Married household head	-0.298****(0.067)	-0.283****(0.067)	0.033(0.097)
Diourbel	-0.021(0.120)	-0.032(0.122)	0.341****(0.106)
Fatick	0.128(0.120)	0.027(0.127)	0.993****(0.189)
Kaolack	-0.187(0.124)	-0.235*(0.125)	0.447****(0.133)
Kolda	-0.062(0.124)	-0.073(0.126)	0.137(0.100)
Louga	0.325****(0.124)	0.295***(0.126)	0.329****(0.099)
Matam	-0.491****(0.136)	-0.536****(0.138)	0.115(0.126)
Saint-Louis	-0.847****(0.170)	-0.919****(0.172)	0.311(0.235)
Tamba	-0.337***(0.145)	-0.375***(0.147)	0.148(0.098)
Thies	-0.327****(0.124)	-0.342****(0.125)	-0.477****(0.114)
Ziguinchor	0.256***(0.115)	0.265***(0.117)	0.043(0.115)
Constant	-0.033(0.340)	-0.003(0.347)	6.088****(1.188)
Observations	2,674	2,674	2,674
R2	0.270	0.279	
Wald test of exogeneity (Chi-2)			65.18***
Validity of instruments (Amemiya-Lee-Newey Chi-2)			10.83
Joint significance of the instruments (F-test)			9.68***

Notes: The dependent variable is the headcount poverty; Dakar is taken as a base group for the regional dummy variables. Standard errors are in the parentheses. *, ** and *** represent the significance at 10%, 5% and 1% respectively.

The estimates related to the locational dummy variables have also shown that the region of Thies still keeps its dominant position relatively to the capital Dakar mainly because of the benefits of tourism and fishery which also constitute the first leading sectors of the Senegalese economy. The dummy variables associated with the other regions are positively related with the

poverty status of the household heads meaning that household heads living in the regions of Diourbel, Fatick, Kaolack and Louga are more likely to be poor relatively to those living in the region of Dakar (Table 4). This can be explained by the fact that there are much more opportunities available at Dakar in comparison with the other regions which have fewer companies, less infrastructures and are more agriculturally-oriented.

The estimates summarized in Table 5 presents the empirical results on the relationship between the social capital index and the probability of being poor for female headed households. Regression (1) shows the simple probit results for the social capital index, regression (2) presents the probit estimates for the different dimensions of social capital and regression (3) summarizes the IV estimations for the social capital index. We mainly focus on the IV results which have corrected the endogeneity problem and are considered as our preferred estimates.

Table 5. Social capital and poverty status of female headed households

	(1)	(2)	(3)
	Probit (social capital index)	Probit (social capital disaggregated)	IV probit estimation (social capital index)
Social capital index	-0.087***(0.013)		-1.630***(0.293)
Membership in organization or association		0.022(0.076)	
Support from others in case of hardship		-0.043(0.033)	
Trust in the community		-0.143***(0.031)	
Mutual assistance		-0.004(0.034)	
Contribution towards common development goals		-0.100(0.076)	
Ownership of radio set		0.073*(0.042)	
Ownership of television set		-0.144***(0.047)	
Feeling of togetherness in the community		-0.333***(0.037)	
Safety		-0.043(0.057)	
Asset index	-0.246***(0.008)	-0.244***(0.010)	0.087(0.064)
Educated household head	-0.025(0.035)	-0.010(0.036)	-0.007(0.054)
Rural household head	0.202***(0.032)	0.187***(0.033)	0.245***(0.051)
Household size	0.092***(0.003)	0.093***(0.003)	0.092***(0.004)
Age of the household head	0.019***(0.006)	0.018***(0.006)	-0.004(0.010)
Squared age	-0.000***(0.000)	-0.000***(0.000)	0.000(0.000)
Married household head	-0.091(0.062)	-0.084(0.062)	0.035(0.098)
Diourbel	0.150***(0.066)	0.141***(0.067)	0.343****(0.107)
Fatick	0.156***(0.067)	0.147***(0.068)	1.008****(0.191)
Kaolack	-0.014(0.066)	-0.069(0.067)	0.455****(0.134)
Kolda	0.146***(0.066)	0.139***(0.067)	0.137(0.101)
Louga	0.390****(0.065)	0.354****(0.066)	0.328****(0.100)
Matam	-0.273****(0.067)	-0.287****(0.068)	0.121(0.128)
Saint-Louis	-0.755****(0.078)	-0.800****(0.080)	0.329(0.237)
Tamba	0.093(0.065)	0.071(0.066)	0.149(0.099)
Thies	-0.200****(0.068)	-0.197****(0.068)	-0.482****(0.115)
Ziguinchor	0.321****(0.068)	0.331****(0.069)	0.039(0.116)
Constant	-0.024(0.160)	-0.207(0.172)	6.191****(1.202)
Observations	9,966	9,966	9,966
R2	0.246	0.251	
Wald test of exogeneity (Chi-2)			6.33**
Validity of instruments (Amemiya-Lee-Newey Chi-2)			2.56
Joint significance of the instruments (F-test)			1.19

Notes: The dependent variable is the headcount poverty; Dakar is taken as a base group for the regional dummy variables. Standard errors are in the parentheses. *, ** and *** represent the significance at 10%, 5% and 1% respectively.

There is no significant difference between the results related to the sample of male headed households (shown in Table 4) and those concerning the sample of female headed households (presented in Table 5) especially with respect to the statistically significant coefficients. The significant impact of the social capital index is again confirmed in the case of female headed households. In fact, the significant and negative relationship between the social capital index and the poverty status of the female headed households suggests a causal link between social capital and the probability of being poor. Table 8 shows that a one unit increase in the social capital index of female headed households can reduce the probability of being poor by 0.926, a value slightly higher than in the sample of male headed households.

As in the full sample and the sample of male headed households, the results drawn from the female headed households also show that there is a positive and significant association between the household size and the poverty status, the dummy variable for rural household heads and the poverty status and the dummy variables for Diourbel, Fatick, Kaolack and Louga and the poverty status. Again, the negative and significant association between the dummy variable for Thies and the poverty status of female headed households is observed.

(2) Disaggregation by location (urban versus rural areas)

Table 6 and Table 7 respectively present the results of the estimations with respect to the sample of household heads living in urban areas and the sample of household heads living in rural areas. Such a disaggregation is important given the differences in culture, behaviors, opportunities, etc among the households living in rural areas and those residing in urban areas.

Regressions (1) and (3) in Table 6 all shows that there is a negative and statistically significant relationship between the social capital index and the poverty status of household heads living in urban areas. Our privileged estimates in regression (3) show that household heads with higher social capital index are less likely to be poor and the relationship is a causal one running from social capital to poverty status. Table 8 (regression 4) suggests that if the social increases by one unit then the probability of being poor reduces by 0.664 for households heads residing in urban areas. Again, the important role played by social capital in the reduction of poverty is confirmed for the sample of household heads living in urban areas. The effects of social capital on urban poverty might be working through mainly the contribution towards common development goals and the feeling of togetherness in the community.

Based on our estimates in regression (3), Table 6 shows that there is negative and significant relationship between the asset index and the poverty status of urban household heads. However, the relationship might not be causal in the sense that the poverty status of a given household head can influence the decision to own an asset or not. Besides, the results also show that the dummy variable for female headed households and the poverty status are negatively and significantly associated implying that female headed households are less likely to be poor. Such

a result can be again explained by the empowerment and promotion of women. In addition, the size of the household is positively and significantly correlated with the poverty status of urban households, showing the heavy burden usually associated with families of large size.

Regression 3 also shows that the dummy variable for married households and the poverty status of rural households are negatively and significantly associated (Table 6). It is difficult to draw clear inference given that a bidirectional relationship is possible: married household heads might be more motivated and constrained to work hard for the family and are therefore less likely to be poor; alternatively, one can also think that household heads are married because they are not poor. Also, there is a non-linear relationship between the age of the household head and its poverty status.

Table 6. Social capital and poverty status of urban households

	(1)	(2)	(3)
	Poverty (social capital index)	Probit (social capital disaggregated)	IV probit estimation (social capital index)
Social capital index	-0.082***(0.016)		-0.741**(0.327)
Membership in organization or association		0.009(0.096)	
Support from others in case of hardship		0.067(0.041)	
Trust in the community		-0.064(0.039)	
Mutual assistance		-0.035(0.042)	
Contribution towards common development goals		-0.236***(0.078)	
Ownership of radio set		0.028(0.052)	
Ownership of television set		-0.047(0.050)	
Feeling of togetherness in the community		-0.491***(0.044)	
Safety		-0.026(0.070)	
Asset index	-0.272***(0.009)	-0.269***(0.011)	-0.132*(0.070)
Educated household head	0.019(0.039)	0.030(0.039)	0.004(0.043)
Female headed household	-0.235***(0.047)	-0.246***(0.047)	-0.222***(0.052)
Household size	0.107***(0.003)	0.108***(0.004)	0.109***(0.004)
Age of the household head	0.025***(0.006)	0.024***(0.006)	0.018**(0.008)
Squared age	-0.000***(0.000)	-0.000***(0.000)	-0.000*(0.000)
Married household head	-0.212***(0.049)	-0.203***(0.050)	-0.175***(0.057)
Diourbel	0.239***(0.068)	0.279***(0.069)	0.283***(0.078)
Fatick	0.075(0.069)	-0.041(0.074)	0.530**(0.238)
Kaolack	-0.157**(0.069)	-0.202***(0.070)	-0.123(0.078)
Kolda	0.027(0.069)	-0.004(0.070)	0.003(0.077)
Louga	0.316***(0.067)	0.276***(0.068)	0.277***(0.077)
Matam	-0.713***(0.078)	-0.768***(0.080)	-0.506***(0.133)
Saint-Louis	-0.570***(0.104)	-0.631***(0.105)	-0.718***(0.135)
Tamba	-0.510***(0.073)	-0.625***(0.075)	-0.235(0.158)
Thies	-0.644***(0.076)	-0.654***(0.077)	-0.753***(0.099)
Ziguinchor	0.030(0.069)	0.050(0.070)	-0.153(0.118)
Constant	0.080(0.189)	0.071(0.201)	2.699**(1.313)
Observations	7,843	7,843	7,843
R2	0.272	0.284	
Wald test of exogeneity (Chi-2)			4.990**
Validity of instruments (Amemiya-Lee-Newey Chi-2)			3.12
Joint significance of the instruments (F-test)			5.50***

Notes: The dependent variable is the headcount poverty; Dakar is taken as a base group for the regional dummy variables. Standard errors are in the parentheses. *, ** and *** represent the significance at 10%, 5% and 1% respectively.

The coefficients associated with the dummy variables of the different regions shows that there is a positive and significant relationship between the poverty status and the dummy variables for the regions of Diourbel, Fatick and Louga (Table 6). This presumes that urban households in those three regions are significantly more likely to be poor comparatively to those living in the capital. Such situation is quite understandable given the relatively few opportunities given in the related regions. In addition, the poverty status of urban households and the dummy variables associated with the regions of Thies, Saint-Louis and Matam are negatively and significantly correlated. This result might be explained by the fact that two of the regions (namely Thies and Saint-Louis) are major touristic and fishing zones while the region of Matam is a region benefiting from huge remittances of the diaspora.

Table 7 presents the results of the estimations related to the impact of social capital on the poverty status of rural households. Such a specification is indeed important given that the majority of poor people are in general located in rural areas. We pay a special attention to regression (3) in Table 7 since it is considered as our preferred estimations because correcting the probable endogeneity of social capital.

The social capital index and the poverty status of rural households are negatively and significantly associated. Therefore, in rural areas as well, we can presume that social capital has a significant impact on the probability of being poor: household heads with higher social capital are less likely to be poor. For instance, if the social capital index increases by one unit the probability of being poor will reduce by 0.939, a reduction far higher than in the case of the sample of household heads living in urban areas. Social connections and associational activities may indeed help in reducing rural poverty in Senegal.

The results show that there is a negative and significant correlation between the asset index and the poverty status of the household heads living in rural areas. It is however not easy to draw a causal relationship between the asset index and the welfare of household heads. In fact, it is possible that individuals get richer because of the assets they own; it is also probable that the welfare status of the household heads leads them to acquire more assets. This is an empirical question that needs to be settled in a different work. Regression (3) in Table 7 also shows that educated households living in rural areas are less likely to be poor. This relationship is also not causal; the poverty status and the dummy variable for 'educated household heads' are just negatively and statistically significantly correlated. However, the relationship still infers on the importance of the association between education and poverty in rural areas.

Again, for rural household heads also, the size of the household and the poverty status are positively and significantly associated implying a burden associated with families of large size. The dummy variables for all regions of Senegal at the time the survey were conducted and the poverty status are positively and significantly related suggesting that household heads living in rural areas of the other regions (Dakar taken as the base category) are more likely to be poor.

Such a result is understandable in the sense that rural areas are mainly agricultural. Furthermore, opportunities are much lower than in the region of Dakar.

Table 7. Social capital and poverty status of rural households

	(1)	(2)	(3)
	Probit (social capital index)	Probit (social capital disaggregated)	IV probit estimation (social capital index)
Social capital index	-0.052***(0.020)		-1.914***(0.443)
Membership in organization or association		0.014(0.104)	
Support from others in case of hardship		0.021(0.046)	
Trust in the community		-0.112**(0.045)	
Mutual assistance		0.034(0.050)	
Contribution towards common development goals		-0.274**(0.112)	
Ownership of radio set		0.129**(0.058)	
Ownership of television set		-0.369***(0.082)	
Feeling of togetherness in the community		-0.242***(0.057)	
Safety		0.005(0.080)	
Asset index	-0.246***(0.013)	-0.233***(0.016)	-0.203*(0.106)
Educated household head	-0.058(0.063)	-0.037(0.064)	-0.213*(0.125)
Female household head	-0.367***(0.075)	-0.360***(0.076)	-0.199(0.134)
Household size	0.098***(0.005)	0.101***(0.005)	0.082***(0.008)
Age of the household head	0.011(0.008)	0.011(0.008)	-0.008(0.014)
Squared age	-0.000(0.000)	-0.000(0.000)	0.000(0.000)
Married household head	-0.044(0.085)	-0.042(0.085)	0.003 (0.147)
Diourbel	0.825***(0.157)	0.708***(0.160)	1.218***(0.267)
Fatick	1.141***(0.157)	1.098***(0.160)	1.963***(0.314)
Kaolack	0.969***(0.157)	0.847***(0.159)	2.118***(0.366)
Kolda	1.099***(0.158)	1.010***(0.161)	1.135***(0.253)
Louga	1.362***(0.158)	1.230***(0.162)	1.434***(0.253)
Matam	0.997***(0.156)	0.923***(0.159)	1.537***(0.279)
Saint-Louis	0.122(0.161)	0.016(0.164)	2.336***(0.573)
Tamba	1.687***(0.162)	1.660***(0.164)	0.974***(0.304)
Thies	1.194***(0.158)	1.178***(0.159)	0.827***(0.266)
Ziguinchor	1.645***(0.161)	1.615***(0.164)	1.402***(0.260)
Constant	-0.906***(0.268)	-0.875***(0.284)	6.282***(1.725)
Observations	4,797	4,797	4,797
R2	0.204	0.213	
Wald test of exogeneity (Chi-2)			54.32***
Validity of instruments (Amemiya-Lee-Newey Chi-2)			12.85
Joint significance of the instruments (F-test)			5.71***

Notes: The dependent variable is the headcount poverty; Dakar is taken as a base group for the regional dummy variables. Standard errors are in the parentheses. *, ** and *** represent the significance at 10%, 5% and 1% respectively.

Table 8. Social capital and poverty status, the marginal effects (IV estimation results)

	(1)	(2)	(3)	(4)	(5)
	Full sample	Male	Female	Urban	Rural
Social capital index	-0.913*** (0.018)	-0.902*** (0.020)	-0.926*** (0.100)	-0.664*** (0.160)	-0.939*** (0.024)
Observations	12,640	9,966	2,674	7,843	4,797

Notes: The dependent variable is the headcount poverty; Dakar is taken as a base for the regional dummy variables. Standard errors are in the parentheses. *, ** and *** represent the significance at 10%, 5% and 1% respectively.

8. Concluding remarks

Social capital has been described as an empirically elusive concept, yet has also been heralded as the glue that holds communities together. Given the importance of community life and social connection in Africa (for example, extended family and variety of ceremonies and celebrations), it would be interesting to see how helpful is social capital for the welfare and poverty status of the households. Using the 2005 Senegalese Household Survey, we have constructed an index of social capital and empirically investigated the relationship between social capital and household welfare. Our results show that social capital is significantly associated with per capita household expenditure. Our results are in line with the findings of Narayan and Pritchett (1999), Grootaert et al. (2002) and Grootaert and Narayan (2004) for the case of Tanzania, Burkina Faso and Bolivia, respectively. In fact, higher social capital and higher per capita expenditure are more likely to be associated; there is a strong relationship between the level of associational activities and the household welfare.

The literature on social capital has identified (at least) three mechanisms through which social capital affects household welfare; they are sharing of information among association members, reduction of opportunistic behavior and improved collective decision making (Woolcock, 1998; Grootaert and Narayan, 2004). In this study, we presume that these mechanisms are embodied in the variables ‘trust in the community’, ‘contribution towards common development goals’ and ‘feeling of togetherness in the community’. In fact, in the context of Senegal, household heads with higher social capital are more likely to trust in most of the people in the community, more likely to participate in terms of money or time toward common development goals and more likely to have a strong feeling of togetherness in the community. In our regressions, the above-mentioned variables are significantly associated with the probability of being poor. It is however to be noted that we were not able to conclude as to a causal relationship given that an instrumental variable method was not applied for the disaggregated social capital variables.

The instrumental variables estimation used to correct the probable endogeneity of social capital (index) shows that there is a causal relationship between social capital and household per capita expenditure. Our findings therefore show that household heads with higher social capital are more likely to have higher per capita expenditure, better welfare and thereafter less likely to be poor. Social capital affects significantly the poverty status of the household heads. A disaggregation of the sample by gender (female and male headed households) and location (household heads living in rural and urban areas) confirms the results related to the negative and significant impact of the social capital on the probability of being poor. The impacts are slightly higher for female headed households than for male headed households but greatly higher for household heads residing in rural areas comparatively to those living in urban areas.

Based on our results, we can suggest the promotion of social capital as a factor to increase

the welfare of households and probably reduce poverty in Senegal. Therefore, we recommend the government to support the initiatives at the local, community, regional and state level aimed at creating and strengthening social capital. However, the policy levers available to expand social capital have not been empirically investigated in the present study. Therefore, further investigations are needed regarding the efficient and best ways to increase the social capital level in the Senegalese society. What is evident is that our findings may support the role important of delegating responsibility to grassroots where the decision making might be more efficient.

Future research will look at the impact of social capital on household welfare in the respective regions of Senegal. In fact, given the regional differences in culture, geography, history and relative prosperity, reinforced by the significant coefficients of the locational dummy variables, it might be worthwhile to estimate regressions separately for each region. This is an objective of our future researches. Besides, it would be also necessary to compare the returns to social capital with those to human capital and physical capital in the case of Senegal given that they are considered as the three capitals contributing to the generation of incomes (Narayan and Pritchett, 1999; Grootaert et al., 2002 and Grootaert and Narayan, 2004).

Acknowledgements

We are indebted to the *Agence Nationale de la Statistique et de la Démographie* (ANSD) of the Republic of Senegal for providing the dataset. We are grateful to Professor Chikayoshi Saeki for his guidance. We would like to thank the participants to the Economic Engineering Research Workshop (Faculty of Economics, Kyushu University) held on October 16th 2012 for their constructive comments and suggestions.

Appendix

Table A.1. Definition of the variables used in the empirical analyses

Variable	Definition
Household per capita expenditure	Total of the nonfood expenditures and food expenditures. The expenditures are in CFA franc, the currency of the
Poverty status	Dummy variable showing whether the household head is poor or not.
Social capital index	Index constructed from 5 dimensions and showing the social capital of the household heads.
Membership in organization or association	Dummy variable showing whether the household head is member of an organization/association or not.
Support from others in case of hardship	Dummy variable showing whether the household head gets support from non-family members or not.
Trust in the community	Dummy variable showing whether the household head gets support from friends and relatives or not
Mutual assistance	Dummy variable showing whether the household head gets support from extended family or not
Contribution towards common development goals	Ready to make a contribution for the reduction of poverty in the community
Ownership of radio set	Dummy variable showing whether the household head has a radio or not
Ownership of television set	Dummy variable showing whether the household head has a TV or not
Feeling of togetherness in the community	Dummy variable showing whether the household head is satisfactory about the expenditures in ceremonies
Safety	Dummy variable showing whether the household head feels safe.
Asset index	Index constructed from 20 dimensions and showing the asset ownership of the household heads.
Educated household head	Dummy variable showing whether the household head is educated or not.
Female headed household	Dummy variable showing whether the household head is female or not.
Rural household head	Dummy variable showing whether the household head is living in rural area or not.
Household size	The number of persons living in the household.
Age	Age of the household head.
Squared age	Square of the age of the household head.
Married household head	Dummy variable showing whether the household head is married or not.
Distance to the closest market	Distance from the dwelling of the household head to the closest market. The distance is specified in number of minutes spent and the variable is ordered multinomial.
Distance to the closest public transport	Distance from the dwelling of the household head to the closest public transport. The distance is specified in number of minutes spent and the variable is ordered multinomial.
Distance to the closest primary school	Distance from the dwelling of the household head to the closest primary school. The distance is specified in number of minutes spent and the variable is ordered multinomial.
Distance to the closest secondary school	Distance from the dwelling of the household head to the closest secondary school. The distance is specified in number of minutes spent and the variable is ordered multinomial.
Distance to the closest telecentre	Distance from the dwelling of the household head to the closest telecentre. The distance is specified in number of minutes spent and the variable is ordered multinomial.

Source: Based on ESPS (2005)

Table A.2. Summary statistics, full sample

Variable	Observations	Mean	Standard deviation	Min.	Max.
<i>1. Per capita expenditure and poverty variable</i>					
Household per capita expenditure (ln)	13568	6.570	0.677	0.438	9.794
Headcount poverty	13568	0.429	0.495	0	1
<i>2. Social capital variables</i>					
Social capital index	12640	4.916	1.235	1	10
Membership in organization or association	13568	0.039	0.194	0	1
Support from others in case of hardship	13568	0.294	0.456	0	1
Trust in the community	13568	0.363	0.481	0	1
Mutual assistance	13568	0.767	0.423	0	1
Contribution towards common development goals	13568	0.954	0.210	0	1
Ownership of radio set	13568	0.821	0.383	0	1
Ownership of television set	13568	0.369	0.483	0	1
Feeling of togetherness in the community	13568	0.221	0.415	0	1
Safety	12640	0.073	0.260	0	1
<i>3. Physical and human capital variables</i>					
Asset index	13568	5.028	2.748	0	21
Educated household head	13568	0.322	0.467	0	1
<i>4. Household characteristics</i>					
Female headed household	13568	0.212	0.409	0	1
Rural household head	13599	0.367	0.482	0	1
Household size	13568	9.012	5.699	1	68
Age	13568	50.659	14.640	16	99
Squared age	13568	2780.641	1594.384	256	9801
Married household head	13568	0.833	0.373	0	1
<i>5. Regional dummies</i>					
Diourbel	13599	0.088	0.284	0	1
Fatick	13599	0.088	0.284	0	1
Kaolack	13599	0.088	0.284	0	1
Kolda	13599	0.088	0.284	0	1
Louga	13599	0.088	0.284	0	1
Matam	13599	0.089	0.284	0	1
Saint-Louis	13599	0.088	0.284	0	1
Tamba	13599	0.088	0.284	0	1
Thies	13599	0.088	0.283	0	1
Ziguinchor	13599	0.088	0.284	0	1
<i>6. Instrumental variables</i>					
Distance to the closest market	13568	2.304	1.527	1	5
Distance to the closest public transport	13568	2.019	1.460	1	5
Distance to the closest primary school	13568	1.530	1.089	1	5
Distance to the closest secondary school	13568	2.720	1.575	1	5
Distance to the closest telecentre	13568	1.863	1.540	1	5

Source: Based on ESPS (2005)

References

- [1] ANSD (2006), *Situation Economique et Sociale du Sénégal*, Edition 2005, Dakar: Ministère de l'Economie et des Finances (République du Sénégal).
- [2] Collier, P. (1998), "Social Capital and Poverty," Social Capital Initiative Working Paper 4. World Bank, Social Development Department, Washington, D.C..
- [3] DPS (Direction de la Prévision et de la Statistique, 2002), *Deuxième enquête Sénégalaise auprès des Ménages (ESAM II)*, Dakar: Ministère de l'Economie et des Finances (République du Sénégal).
- [4] Durlauf, S. (2002), "On the Empirics of Social Capital," *Economic Journal* 112 (483): 459-479.
- [5] Durlauf, S. and M. Fafchamps (2004), "Social Capital," NBER Working Paper No.10485.
- [6] ESPS (Enquête de Suivi de la Pauvreté au Sénégal, 2005), Agence Nationale de la Statistique et de la Démographie (ANSD) de la République du Sénégal. www.ansd.sn.
- [7] González-Arangüena, E., A. Khmel'nitskaya, C. Manuel and M. del Pozo (2011), "A Social Capital Index," *Cuaderno de Trabajo número 01/2012*.
- [8] Grochowska, A. and P. Strawiński (2010), "Impact of Social Capital on Individual Well-being in Poland Proxy-based Approach," Working Papers No. 13/2010(36), University of Warsaw.
- [9] Grootaert, C. (2001), *Does Social Capital Help the Poor? A Synthesis of Findings from the Local Level Institutions Studies in Bolivia, Burkina Faso and Indonesia*, Social Development Family, Washington D.C.: The World Bank.
- [10] Grootaert, C. (1999), "Social Capital, Household Welfare, and Poverty in Indonesia," Local Level Institutions Working Paper 6. World Bank, Social Development Department, Washington, D.C..
- [11] Grootaert, C. and T. Bastelaer (2002), *Understanding and Measuring Social Capital: A Synthesis of Findings and Recommendations from the Social Capital Initiative*, The World Bank Washington, DC and The IRIS Center Department of Economics, University of Maryland University at College Park Maryland USA.
- [12] Grootaert, C. and D. Narayan (2004), "Local Institutions, Poverty and Household Welfare in Bolivia," *World Development* 32(7):1179–1198.
- [13] Grootaert C., D. Narayan, J. V. Nyhan and M. Woolcock (2004), "Measuring Social Capital: An Integrated Questionnaire," World Bank Working Paper No. 18.
- [14] Grootaert C., G. T. Oh, and A. Swamy (2002), "Social Capital, Household Welfare and Poverty in Burkina Faso," *Journal of African Economies* 11(1): 4-38.
- [15] Haughton, J., and S. R. Khandker (2009), *Handbook on Poverty and Inequality*, Washington, D.C.: TheWorld Bank.
- [16] Isham, J. (2002), "The Effect of Social Capital on Fertiliser Adoption: Evidence from Rural

- Tanzania,” *Journal of African Economies* 11(1): 39-60.
- [17] Knack, S. (1999), “Social Capital, Growth, and Poverty: A Survey of Cross-Country Evidence,” Social Capital Initiative Working Paper 7. World Bank, Social Development Department, Washington, D.C..
- [18] Knack, S. and P. Keeper (1997), “Does Social Capital Have an Economic Payoff? A Cross-Country Investigation,” *Quarterly Journal of Economics* 112: 1251-1288.
- [19] Kuroki, M. (2011), “Does Social Trust Increase Individual Happiness in Japan?” *The Japanese Economic Review* 62(4): 444-459.
- [20] Narayan, D. and L. Pritchett (1999), “Cents and Sociability: Household Income and Social Capital in Rural Tanzania,” *Economic Development and Cultural Change* 47(4): 871-897.
- [21] OECD (2001), *The Well-Being of Nations: the Role of Human and Social Capital*, Centre for Educational Research and Innovation, Paris: OECD.
- [22] Putnam, R. (1995), “Bowling Alone: America’s Declining Social Capital,” *Journal of Democracy* 6(1): 65-87.
- [23] Putnam, R. D., R. Leonardi, and R. Y. Nanetti (1993), *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press.
- [24] Roslan, A., A. A. Nor and I. Russayani (2010), “Social Capital Reduce Poverty? A Case Study of Rural Households in Terengganu, Malaysia,” *European Journal of Social Sciences* 14(4): 556-566.
- [25] Sen, A. K. (1987), *Hunger and Entitlements*, Amsterdam: North Holland Press.
- [26] United Nations Development Programme (UNDP, 1997), *Human Development Report*, New York: Oxford University Press.
- [27] Woolcock, M. (1998), “Social Capital and Economic Development: Toward a Theoretical Synthesis and Policy Framework,” *Theory and Society* 27(2): 151-208.
- [28] Woolcock, M and D. Narayan (2000), “Social Capital: Implications for Development Theory, Research and Policy,” *World Bank Research Observer* 15 (2).
- [29] Wooldridge, J. M. (2005), *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press.
- [30] World Bank (2004), “Social Capital for Development,” World Bank. Available from: <http://www1.worldbank.org/prem/poverty/scapital/index.htm>. [Accessed August 12, 2012]
- [31] World Bank (2001), *World Development Report 2000/2001: Attacking Poverty*, New York: Oxford University Press.
- [32] World Bank (1999), *What is Social Capital?* PovertyNet. Available from: <http://www.worldbank.org/poverty/scapital/whatsc.htm>. [Accessed May 11, 2012]
- [33] World Bank (1998), “The Initiative on Defining, Monitoring and Measuring Social Capital: Overview and Program Description,” Social Capital Initiative Working Paper No. 1, World Bank, Washington, D.C..