

## **Does Social Capital Mitigate Precariousness?**

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# Does Social Capital Mitigate Precariousness?

## Summary

There is a surprising gap in the economic literature on social capital. First, we lack studies addressing the effects of social capital on those facets of development that can contribute in making growth more sustainable in the long run, like, for example, human development and social cohesion. Second, it is still unclear *what type* of networks may exert a positive effect on the different dimensions of development. In particular, the literature has not yet provided a rigorous assessment of the role of strong family ties, that are generally referred to as a form of *bonding* social capital causing backwardness. This paper carries out an empirical investigation into the relationship between the three types of social capital so far identified by the literature (i.e. *bonding*, *bridging* and *linking*), human development, and labour precariousness, in the belief that precariousness and uncertainty play a crucial role in determining the social cohesion and well-being that are necessary to make growth sustainable in the long run.

**Keywords:** Social capital, Human development, Labour market, Precariousness, Italy

**JEL Classification:** J24, O15, Z13

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# Does Social Capital Mitigate Labour Precariousness?\*

## 1. Introduction

The economics literature on social capital generally focuses on the relationship between networks, trust, and economic growth. There is a surprising lack of studies addressing the effects of social capital on those facets of development that can contribute in making growth more sustainable in the long run, like, for example, human development and social cohesion. Another gap in the empirical research regards the definition of *what type* of networks may exert a positive effect on the different dimensions of development. In particular, the literature has not yet provided a rigorous assessment of the role of strong family ties, that, starting from Banfield's pioneer work on Italy, are commonly considered as a possible source of backwardness.

This paper carries out an empirical investigation into the relationship between the three types of social capital so far identified by the literature (i.e. bonding, bridging and linking), human development, and labour precariousness. The choice of focusing on such variables is rooted in our discontent for the excessive attention devoted to growth by the economic literature.

It is true that economic growth, by increasing total wealth, also enhances its potential for improving well-being and solving other social problems. However, as stated by the World Bank (2000), 'History offers a number of examples where economic growth was not followed by similar progress in human development. Instead growth was achieved at the cost of greater inequity, higher unemployment, weakened democracy, loss of cultural identity, or overconsumption of resources needed by future generations ... To be sustainable, economic growth must be constantly nourished by the fruits of human development ... Conversely, slow human development can put an end to fast economic growth' (2000, 7-8).

Regarding precariousness, it is our belief that it plays a crucial role in determining social cohesion and the agents' well-being. Precarious workers are generally characterized by low employment conditions in terms of pay, employment security, sickness and parental benefits, balance between work and private life. They are usually provided with less work-related training and enjoy scarce prospects of building a career. The high exposure to the risks of job loss, wage variability, and intermittent unemployment raises the uncertainty on future incomes, making difficult any form of long-term planning of life activities such as marriage and procreation.

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Labour precariousness can thus be seen as a barrier to social integration that may destroy human and social capital: a high level of flexibility on employment hinders training and qualification and, at the same time, hampers the consolidation of social ties, both inside and outside the workplace. While a stable and satisfactory work provides not only income, but also an identity and a ‘sense of belonging’, precariousness generates discouragement and distrust towards labour market institutions that, at the macro level, may result in a more distrustful society.

Our contribution to the literature is twofold. First, we provide an empirical analysis that simultaneously accounts for all of the three forms of social capital, thereby introducing the first rigorous assessment of the role of strong family ties and shedding light on the diverse effects exerted by each social capital’s dimension. Second, we introduce the theme of labour precariousness in the debate on social capital and economic development.

The causal relationships connecting variables have been assessed through structural equations models, a technique that has grown up in psychometrics and proves to be particularly suitable for the investigation of multidimensional phenomena like social capital and economic development.

The paper is organized in three sections: in section 2, we provide some definitions. Section 3 carries out a review of the role of social networks in reducing unemployment and precariousness. Section 4 describes the methodology and results of the empirical analysis. We conclude the paper with a brief discussion of the main empirical findings.

## **2. Definitions**

Everyday-life experience suggests that social networks may play a double-sided role in economic development and well-being. On the one side, they are a fertile ground for nurturing trust and shared values, that reduce monitoring costs and facilitate transactions. Repeated interactions among group members foster the diffusion of information raising reputations’ relevance. The higher opportunity cost of free-riding in prisoners’ dilemma kind of situations makes the agents’ behaviour more foreseeable causing an overall reduction of uncertainty. Therefore, an increase in trust-based relations may reduce the average cost of transactions, just as an increase in physical capital reduces the average cost of production. However, networks can work in the opposite direction as well: members of a group may use their ties as a means for the pursuit of narrow sectarian interests, and organizations may lobby against the interest of other groups. The distinction between bonding, bridging and linking social capital reflects the different roles that networks may play in shaping the economic development of a society.

The term ‘bonding’ holds a negative connotation and generally refers to small circles of homogeneous people that do not cooperate with other outside the boundaries of the group. The

literature has often focused on the family as a potential form of bonding social capital. In his pioneer study, Banfield (1958) partly attributed the backwardness of Southern Italy to the inability of citizens 'to act together for their common good or, indeed, for any end transcending the immediate, material interest of the nuclear family' (1958, 10). According to the author, any family activity was oriented towards the protection and consolidation of the isolated family unit. 'Moral' activity (i.e. any action informed by moral norms of trust and reciprocity) was seen as limited to family insiders, with outsiders only being significant as a potential resource to exploit for the family. Applying Banfield's claims to the purposes of this paper, we can argue that the bonding social capital of the family may act as a tool for job search actions, thereby mitigating labour precariousness, and, at the macro level, as a factor hampering the economic performance and development.

Bridging social capital is given by horizontal ties shaping heterogeneous groups of people with different backgrounds. The term bridging refers to the ability of such networks to create 'bridges' connecting sectors of society that, otherwise, would have never come into contact. The common claim is that bridging social capital has positive effects on the diffusion of information and trust, thus fostering transactions and economic growth.

The term linking social capital describes ties connecting individuals, or the groups they belong to, to people or groups in position of political or financial power. For example, civil society organizations allow citizens to come into contact with the institutions to carry out advocacy activities through collective action. This kind of networks is critical for leveraging resources, ideas and information beyond normal community linkages and, therefore, may play a significant role for social well-being. However, the role of organizations in development is widely debated in the literature. Economic studies suggest that much depends on the context where NGOs' activities take place. Knack and Keefer (1997) sustain that cooperation and solidarity connected with the presence of voluntary associations work better at the level of smaller communities. In the authors words: 'If the economic goals of a group conflict with those of other groups or of unorganized interests, the overall effect of group memberships and activities on economic performance could be negative ... Although the ability of groups to articulate their interests is likely to be an important restraint on government, it also provides groups a way to capture private benefits at the expense of society' (1997, 1271). In other words, organizations can behave pro-socially as well as anti-socially, just like all the other forms of social capital. Regarding labour precariousness, the effect of the associational activity has not been the object of empirical investigations yet. These hypotheses on the divergent roles exerted by the three types of social capital on precariousness and development will be tested in section 4 within the empirical investigation on the Italian regions.

According to the UNDP (2007), 'Human development is about much more than the rise or fall of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests ... Development is thus about expanding the choices people have to lead lives that they value. And it is thus about much more than economic growth, which is only a means - if a very important one - of enlarging people's choices'. Human development is generally measured through the human development index, that is computed as the average of three indexes representing life expectancy, education, and per capita income. In this paper, the human development index has been adjusted in order to take into account Italy's high level of wealth.

As regards labour precariousness, in its 'Classification of Status in Employment', the International Labour Organisation (ILO) defines 'precarious' workers as either: (a) workers whose contract of employment leads to the classification of the incumbent as belonging to the groups of 'casual workers'; (b) 'short-term workers' or 'seasonal workers'; or (c) workers whose contract of employment will allow the employing enterprise or person to terminate the contract at short notice and/or at will, the specific circumstances to be determined by national legislation and custom. The ILO defines 'casual' workers as having an explicit or implicit contract of employment which is not expected to continue for more than a short period.

### **3. The labour market**

The social capital literature has shown that workers have better chances of finding employment when using networks (Granovetter, 1973, 1974, Fernandez et al, 2000, Munshi, 2003). In economic theory, Boorman (1975) was the first to provide a formal network model which described the information structure of finding a job. In Boorman's model, networks are endogenous: contacts are developed by individuals who maximize their probability of getting a new job in the event that they lose their present job. Another formal model has been developed by Calvo-Armengol and Jackson (2004), to prove that the employment likelihood increases with the extent of social contacts.

An interesting empirical study by Datcher (1983), focusing on the impact sorted by informal networks on the probability of quitting a job, finds that workers with contacts before being hired are less likely to quit their jobs. In other words, a higher extension of the worker's social networks implies a longer job duration. Within an empirical study on Mexican immigrant workers, Aguilera (2003) has proved that increases in human capital are associated with shorter job tenure, apparently in an effort to improve employment conditions, while the use of social capital is positively related with job tenure. In general, it appears that acquiring employment is a social process, and those using personal networks find longer lasting jobs. A following study on Mexican immigrants by Amudeo-

Dorantes and Mundra (2004) finds that social networks, particularly strong ties, contribute to the economic assimilation of immigrants by raising their hourly wages. However, networks do not enhance immigrants' employability. Instead, strong ties allow for a lower employment likelihood possibly through the shelter against temporary unemployment provided by close family members.

This quick glance at the literature suggests the possibility for social networks to generate virtuous circles, going from precariousness' reduction and the improvement of workers' well-being, to the accumulation of new social capital in the form of trust and more stable social ties. What should be the object of further investigations is the effect of such social networks-induced job matching processes on the overall efficiency of the labour market. For example, Bentolila et al. (2003) argue that in the presence of imperfect information on jobs and workers' characteristics, networks can induce a significant mismatch of talents. This result has been empirically confirmed by Ferrante and Sabatini (2007) in their analysis of the effects sorted by human and social capital on the occupational choices of Italian workers.

The crucial role of precariousness in the determination of well-being has been stressed also by the recent happiness literature. Drawing on data from the Longitudinal Surveys of Australian Youth, Dockery (2005) investigates factors that influence young Australians' self-reported levels of happiness during the school-to-work transition, focusing on the role of labour market experience. The author finds evidence of declining well-being with duration of unemployment and of the importance of job quality, rather than just having a job. Some notable studies provide evidence that unemployment significantly reduces happiness in Europe and the USA (Di Tella, McCulloch and Oswald, 1997) in Britain (Clarck and Oswald, 1994), and in Britain and the USA (Blanchflower and Oswald, 2002). Gerlach and Gesine (1996) find similar results for Germany.

#### **4. Empirical analysis**

The aim of this section is to shed light on *what type* of social capital plays a role in reducing precariousness thus improving well-being, and to assess whether there is a relationship with human development. The analysis is based on a dataset collected by the author, including about 200 indicators representing the 'structural' dimensions of social capital and different aspects of the quality of economic development. Principal component analyses have been performed on three subsets of variables with the aim to build synthetic, latent, measures of strong family ties (i.e. bonding social capital), weak informal ties among friends, neighbours and acquaintances (bridging social capital) and weak ties connecting members of voluntary organizations (linking social capital). Principal component analysis (PCA) explains the variance-covariance structure of a dataset through a few linear combinations of the original variables. Its general objectives are data reduction and

interpretation<sup>1</sup>. Rough data on social capital are drawn by a set of multipurpose surveys carried out by the Italian National Bureau of Statistics (Istat) on a sample of 20.000 households between 1998 and 2002. Data are aggregated at the ‘regional’ level, i.e., there are 20 analysis units corresponding to the Italian regions, traditionally characterized by a strong North-South polarization.

The variables adopted in the analysis are as follows:

- the bonding social capital shaped by strong ties connecting family members. This variable is measured by the first factor obtained from a PCA performed on a dataset of 25 indicators representing family size, the spatial proximity among family members, the frequency of encounters and the quality of relationships. Variables are described in table A1 (Annex 1).
- Bridging social capital, as measured by the first factor obtained from a PCA performed on a dataset of 12 variables representing people social engagement, or what can be referred to as the consumption of relational goods, like frequenting sport clubs, dining out with friends, and talking with neighbours. Variables are described in table A2 (Annex 1).
- The linking social capital shaped by weak formal ties connecting people from different socioeconomic backgrounds within the boundaries of voluntary organizations. This measure is given by the first factor resulting from a PCA performed on a set of 6 variables representing different dimensions of associational participation, described in detail in table A3 (Annex 1).
- The human development index, as adjusted to take into account Italy’s level of wealth, different from that of most developing countries. The index of life expectancy has been computed adopting 50 and 85 years respectively as minimum and target levels, the index summarizing literacy and schooling has been replaced by the rate of high school attendance, and the index of per capita income has been computed adopting higher living standards as minimum and target levels. Basic indicators are described in detail in table A4 (Annex 1).
- As pointed out in the introduction, we have extended the ILO’s notion of labour precariousness to comprise people looking for a job, who suffer from the highest degree of uncertainty. Labour precariousness is thus measured by the ratio between the sum of three variables representing precariousness (workers with provisional contracts, freelancers, and people looking for a job) and the regional labour force:

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<sup>1</sup> Although  $p$  components are required to reproduce the total system variability, often much of this variability can be accounted for by a small number,  $k$ , of the principal components. If so, there is (almost) as much information in the  $k$  components as there is in the original  $p$  variables. The  $k$  principal components can then replace the initial  $p$  variables, and the original dataset, consisting of  $n$  measurements on  $p$  variables, is reduced to one consisting of  $n$  measurements on  $k$  principal components. For an overview on PCA see Lebart, Morineau and Warwick, 1984, and Johnson and Wichern, 1992).



$$\text{precariousness} = \frac{\text{workers with provisional contracts} + \text{cococos} + \text{people looking for a job}}{\text{regional labour force}}$$

The index ranges from 1 (highest precariousness) to 0.

*Cococos* is an acronym standing for *collaboratori coordinati e continuativi*, a category of workers provided by the Italian law, that includes occasional or co-ordinated long-term freelancers and project freelancers. Theoretically, cococos are a particular type of self-employed workers. De facto, they are atypical subordinate workers at the lowest level of the occupational hierarchy, and suffer from low employment conditions in terms of pay, employment security, sickness and parental benefits, and balance between work and private life.

The causal relationships connecting variables have been assessed through structural equations models, a technique that has grown up in psychometrics and proves to be particularly suitable for the investigation of multidimensional phenomena like social capital and economic development<sup>2</sup>. A SEM is ‘A stochastic model where each equation represents a causal linkage, rather than a simple empirical association’ (Goldberger, 1972, 979). SEMs are composed by regression equations, which are included in the model only so far as it is possible to interpret them as causal relationships, theoretically justifiable and not falsified by data. A peculiarity of SEMs is the possibility to account for other parameters in addition to structural  $\beta$  linking endogenous and exogenous variables. More precisely, it is possible to account for variances and covariances among errors  $e$ , which play a fundamental role in defining the model presented in this paper. The matrix  $\Psi$  of covariances among errors  $\zeta$  has been carefully defined in each of the models that have been tested within the analysis, allowing to account for variables which, although not explicitly considered within the model, may play a role in the real scenario described by observed data.

Let  $\eta_1$  be bridging social capital,  $\eta_2$  linking social capital,  $\eta_3$  adjusted human development,  $\eta_4$  social quality,  $\eta_5$  the state of health of urban ecosystems, and  $\xi_1$  bonding social capital.  $\zeta_i$ , with  $i = (1, \dots, 6)$ , are the errors related to endogenous variables. Hypotheses on causal relationships between variables are guided by results from the multidimensional analysis carried out in section 7. In the model with the best goodness of fit<sup>3</sup>, bridging social capital is influenced by labour precariousness:

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<sup>2</sup> For an overview on structural equations models see Bollen (1989).

<sup>3</sup> Indicators of the model’s goodness of fit are reported in Annex 2.

$$\eta_1 = \beta_{14}\eta_4 + \zeta_1 \quad (1)$$

Linking social capital is influenced by human development:

$$\eta_2 = \beta_{23}\eta_3 + \zeta_2 \quad (2)$$

Human development is influenced by the three types of social capital:

$$\eta_3 = \beta_{31}\eta_1 + \beta_{32}\eta_2 + \gamma_{31}\xi_1 + \zeta_3 \quad (3)$$

Labour precariousness is affected by:

$$\eta_4 = \beta_{41}\eta_1 + \beta_{42}\eta_2 + \beta_{43}\eta_3 + \gamma_{41}\xi_1 + \zeta_4 \quad (4)$$

Errors  $\zeta_1$  and  $\zeta_2$ , and  $\zeta_1$  and  $\zeta_3$  are correlated, due to the assumption that there are other environmental phenomena, not explicitly accounted for within the model, that simultaneously influence bridging and linking social capital, and bridging social capital and human development. In the model, other assumptions are carried out to the seek of simplicity: independent variables and errors are not correlated in the same equation:  $E(\xi\xi')=0$ ; structural equations are not redundant; this condition means that  $\eta$ -equations are independent between them, and each endogenous variable  $\eta$  can not be a linear combination of the others; finally, we have supposed that all variables have been measured without errors, therefore there is a perfect identity between latent and observed variables. This allows us to omit measurement models for endogenous and exogenous variables and to focus exclusively on the structural equations model and on the explanation of the causal relationships linking variables. Combining equations from (1) to (4) with the error covariance matrix, the specification of the model is as follows:

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & \beta_{14} \\ 0 & 0 & \beta_{23} & 0 \\ \beta_{31} & \beta_{32} & 0 & 0 \\ \beta_{41} & \beta_{42} & \beta_{43} & 0 \end{bmatrix} \cdot \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ \gamma_{31} \\ \gamma_{41} \end{bmatrix} \cdot [\xi_1] + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \end{bmatrix} \quad \begin{bmatrix} 1 & & & \\ \psi_{21} & 1 & & \\ \psi_{31} & 0 & 1 & \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad (5)$$

Parameters estimates are presented in table 1.

Variables	Bridging social capital	Linking social capital	Human development	Labour precariousness	Bonding social capital
Bridging social capital				-1.05 (0.25) -4.15	
Linking social capital			0.65 (0.25) 2.55		
Human development	-1.00 (0.43) -2.35	0.31 (0.48) 0.64			-1.35 (0.28) -4.73
Labour precariousness	2.09 (0.48) 4.33	-1.71 (0.41) -4.17	-2.30 (0.45) -5.08		-0.70 (0.45) -1.55

Labour precariousness is significantly mitigated by bonding social capital and, to a higher extent, by human development. The linking social capital of voluntary organizations exerts a positive effect in reducing precariousness as well, while weak bridging ties connecting friends and acquaintances do not seem to alleviate precariousness. This result partly contradicts Granovetter's (1973) claim on the strength of weak ties: in Italy's Southern regions, the action of supporting people in their job placement can be motivated just by the existence of strong ties or, in other words, by what Banfield (1958) referred to as 'amoral familism', i.e. the imperative of protecting and consolidating the isolated family unit. Weak ties may function as a means fostering the diffusion of information, but do not concretely help workers in their job search actions. On the other side, the analysis does confirm the negative effect of bonding social capital on human development. This view of the family as an isolated moral community is indeed strongly representative of the social reality of Southern Italy, where most people do not act morally outside the family. However, what to an external observer may look just as a perverse mechanism hampering labour market's efficiency and, in the long run, development processes as well, deserves a more in-depth reflection. The mutual assistance mechanisms developed within the family unit should be looked on also as a defence reaction against situations of underdevelopment and 'social poverty', where both the state's and market's institutions are weak.

Linking social capital proves to exert a positive effect also on human development. This mechanism further strengthens the beneficial influence on workers' well-being, since human development is in turn able to cause a significant reduction of precariousness.

This sounds as a proof of Putnam's claims on the role of voluntary organizations, therefore contradicting part of the economics and political science literature in the field. In Italy, the density of voluntary organizations is in most cases connected with a deep tradition of civic involvement and social participation, and the development of civil society has been largely informed by ideological principles, not directly related to the pursuit of personal or sectarian advantages. On the contrary, bridging social capital negatively affects human development, just like strong family ties. The consumption of relational goods within sport or culture clubs, music bars or restaurants is not necessarily related to those cooperative norms and behaviours that can benefit the economic performance.

The analysis in the paper shows that higher levels of precariousness significantly reduce bridging social capital. The lack of professional stability causes frequent changes in people's relational sphere, thereby leading to a continuous process of breaking and rebuilding social ties. Arguably, workers may react to such situation of uncertainty by taking refuge into their private sphere, at the expenses of social participation.

A model's refinement with a slightly lower goodness of fit clearly states that precariousness reduces also social participation. The model differentiates from the previous one just for the addition of the parameter  $\beta_{24}$ :

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & \beta_{14} \\ 0 & 0 & \beta_{23} & \beta_{24} \\ \beta_{31} & \beta_{32} & 0 & 0 \\ \beta_{41} & \beta_{42} & \beta_{43} & 0 \end{bmatrix} \cdot \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ \gamma_{31} \\ \gamma_{41} \end{bmatrix} \cdot [\xi_1] + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \end{bmatrix} \begin{bmatrix} 1 & & & \\ \psi_{21} & 1 & & \\ \psi_{31} & 0 & 1 & \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad (6)$$

Precarious workers are probably too deep absorbed in their daily struggle for survival, and few time remains for pro-social activities and collective action. Once again, the renounce to social participation may be looked on as a defensive choice. Finally, linking social capital proves to be positively and significantly affected by human development. Parameter estimates are reported in table 2.

Table 2. Maximum likelihood estimates for model (6)

Variables	Bridging social capital	Linking social capital	Human development	Labour precariousness	Bonding social capital
Bridging social capital				-1.06 (0.25) -4.17	
Linking social capital			0.26 (0.73) 0.36	-0.50 (0.93) -0.53	
Human development	-1.04 (0.44) -2.37	0.35 (0.51) 0.70			-1.35 (0.29) -4.69
Labour precariousness	1.96 (0.65) 3.04	-1.42 (0.85) -1.67	-2.32 (0.45) -5.17		-0.66 (0.47) -1.40

## 5. Conclusion

The empirical analysis shows that only bonding social capital mitigates precariousness on the labour market, while the weak ties shaping voluntary organizations are the only type of social capital that nourish human development, thereby fostering sustainable growth.

The literature generally underestimates the positive role exerted on well-being by the mutual assistance and social protection mechanisms promoted by the family. Through their ability to mitigate precariousness, strong family ties may act as a means of defence against high levels of unemployment. In other words, bonding social capital can be seen not only as a cause of backwardness, but also as one of its possible consequences.

However, the main factor reducing precariousness is human development: higher levels of wealth and schooling inevitably lead to an improvement of workers' well-being. The widespread idea that social contacts function as a powerful job placement factor is only partly confirmed by data. In Italy, just strong ties support the reduction of precariousness, while weak ties connecting friends and acquaintances seem to be quite harmful to such purposes. What certainly deserves further investigations is the effect of social networks-induced job matching processes on the allocation of talents: significant mismatches of talents and an excessive job market's closure to outsiders may cause a reduction of efficiency compensating the beneficial effects of precariousness' alleviation. Anyway, it is clear that neglecting the social embeddedness of actors seriously invalidates the explanatory power of any economic analysis of the labour market.

Voluntary organizations are the only type of networks that are shown to be able to nourish human development, thereby fostering a sustainable economic growth. Bonding and bridging social capital,

on the contrary, negatively affect human development. In Italy, the associational activity is strictly connected to sound ideological or religious motivations, and generally implies the sharing of moral norms of trust and reciprocity that can counteract the negative effects of the ‘amoral familism’, as well as the tendency of organizations to lobby for the narrow interests of their members. Finally, it is noteworthy that the relationship between linking social capital and human development proves to have a double direction. Arguably, not only social participation through civil society organizations fosters the institutional and the economic performance, as claimed by Putnam, but the reverse effect is true as well: higher levels of human development encourage people to devote time to community affairs through collective action.

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## Annex 1. Tables

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Table A1. Basic indicators of strong family ties (bonding social capital)

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People aged 14 and more who have given unpaid help to strangers for every 100 people of the same area.

People aged 14 and more particularly caring relatives other than parents, children, grandparents and grandchildren, or counting on them in case of need, for every 100 people of the same area.

Couples with one child, for every 100 couples with children of the same area.

Couples with three children, for every 100 couples with children of the same area.

Couples with children, for every 100 families of the same area.

Couples without children, for every 100 families of the same area.

Families with 5 components and more for every 100 families of the same area.

Singles-families for every 100 families of the same area.

People aged 15 and more with children living 16 kilometres away or more (in Italy or abroad) for every 100 families with children of the same area.

People aged 15 and more with children living within 1 kilometre (cohabitants or not) for every 100 families with children of the same area.

People having their brothers and/or sisters living 16 kilometres away or more (in Italy or abroad) for every 100 people with brothers and/or sisters of the same area.

People having brothers and/or sisters living within 1 kilometre (cohabitants or not) for every 100 people with brothers and/or sisters of the same area.

People meeting their brothers and/or sisters everyday for every 100 people with brothers and/or sisters of the same area.

People aged 6 and more meeting family members or other relatives everyday for every 100 people of the same area.

People up to 69 having their mother living 16 kilometres away or more (in Italy or abroad) for every 100 people with an alive mother of the same area.

People up to 69 having their mother living within 1 kilometre (cohabitant or not) for every 100 people with an alive mother of the same area.

People aged 6 and more never meeting their family members and other non cohabitant relatives for every 100 people of the same area.

People aged 6 and more having neither a family nor other non cohabitant relatives for every 100 people of the same area.

People up to 69 having their father living 16 kilometres away or more (in Italy or abroad) for every 100 people with an alive father of the same area.

People up to 69 having their father living within 1 kilometre (cohabitant or not) for every 100 people with an alive father of the same area.

People aged 14 and more declaring themselves satisfied of relationships with their relatives for every 100 people of the same area.

Families with at least 2 components used to have dinner with other relatives at least once a week for every 100 families of the same area.

People meeting their children everyday for every 100 people with non cohabitant children of the same area.

People meeting their mother everyday for every 100 people with non cohabitant mother of the same area.

People meeting their father everyday for every 100 people with non cohabitant father of the same area.

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Table A2. Indicators of the informal networks of friends and neighbours (bridging social capital)

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Non profit sport clubs for every 10.000 people of the same area.

People aged 6 and more attending bars, pubs, and circles at least once a week for every 100 people of the same area.

People aged 6 and more having dinner outside more than once a week for every 100 people of the same area.

People aged 6 and more meeting friends more than once a week for every 100 people of the same area.

People aged 14 and more attending pubs and bars to listen to music concerts for every 100 people of the same area.

People aged 14 and more attending social centres to listen to music concerts for every 100 people of the same area.

People aged 6 and more never attending bars, pubs and circles for every 100 people of the same area.

People aged 6 and more never having dinner outside for every 100 people of the same area.

People aged 6 and more never talking with others for every 100 people of the same area.

People aged 6 and more never talking with neighbours for every 100 people of the same area.

People aged 6 and more talking with others once a week or more for every 100 people of the same area.

People aged 6 and more talking with neighbours once a week or more for every 100 people of the same area.

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Table A3. Indicators of linking social capital

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People aged 14 and more who have helped strangers in the context of a voluntary organization's activity, for every 100 people of the same area.

People aged 6 and more who, when meeting friends, carry out voluntary activities for every 100 people meeting friends of the same area.

Voluntary organizations for every 10.000 people

People aged 14 and more who have joined meetings in cultural circles and similar ones at least once a year for every 100 people of the same area.

People aged 14 and more who have joined meetings in ecological associations and similar ones at least once a year for every 100 people of the same area.

People aged 14 and more who have given money to an association at least once a year for every 100 people of the same area.

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Table A4. The adjusted index of human development

Label	Description
ISUA	Adjusted human development index, computed as the arithmetic mean of LIFE, SCHOOL and INCOME
LIFE	Dimensional index of life expectancy. Minimum value = 50 years. Target value = 80 years
SCHOOL	Dimensional index of high school attendance, given by the percentage of people aged from 14 to 18 who are enrolled in high schools. Minimum value = 0. Target value = 100
INCOME	Dimensional index of per capita income. Minimum value = 5.000€. Target value = 40.000€. $INCOME = [\log(\text{effective value}) - \log(5.000)] / [\log(40.000) - \log(5.000)]$

## Annex B. Goodness of fit

Measures of the model's goodness of fit are a function of the residual, i.e. the difference between the empirical variance-covariance matrix and the model-created variance-covariance matrix. It is possible to show (Bonnet and Bentler, 1983), that, if the model is correct, the fitting statistic follows a  $\chi^2$  with  $df$  degrees of freedom, where  $df = \frac{1}{2}(p + q)(p + q + 1) - t$ ,  $p$  is the number of endogenous variables,  $q$  is the number of exogenous variables, and  $t$  is the number of estimated parameters. In order to evaluate the goodness of fit, the residual function for model (5) must be compared with critical values reported in  $\chi^2$  distribution tables with a probability  $P = 0.100$ . Since the value for this model is significantly lower than the critical value for a  $\chi^2$  with three degrees of freedom ( $\chi^2 = 0.44 < 6.251$ ), we can state that the difference between the two variance-covariance matrixes is stochastic in nature, and is not due to the inappropriateness of the theoretical model. All the other goodness of fit indexes exhibit satisfactory values.

The Goodness of Fit Index (*GFI*):

$$GFI = 1 - \frac{T}{\max(T_i)}$$

is equal to 0.99. This means a good fit.

The Adjusted Goodness of Fit Index (*AGFI*) takes into account also the model's number of degrees of freedom, i.e. its parsimoniousness:

$$AGFI = 1 - \left( \frac{k}{df} \right) (1 - GFI)$$

where  $df$  are degrees of freedom, and  $k$  is the number of variances-covariances in input;  $k$  is given by:

$$k = \frac{1}{2}(p + q)(p + q + 1)$$

The *AGFI* is equal to 0.95, thus indicating a satisfactory fit.

The Root mean squared residuals (*RMR*) is:

$$RMR = \sqrt{\frac{1}{k} \sum (s_{ij} - \sigma_{ij})^2}$$

is equal to 0 when the theoretical model-generated variance-covariance matrix fits the empirical matrix, and infinitely grows when the model's goodness of fit worsens. The *RMR* of model (5) is equal to 0.060, thus indicating a good fit.

The fitting statistics for model (6) is equal to 0.43, significantly lower of the critical value 4.605 of the  $\chi^2$  distribution with two degrees of freedom. The other statistics are: *RMR* = 0.063, *GFI* = 0.99, and *AGFI* = 0.93.

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