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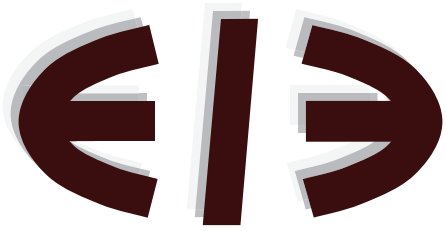
EERI Research Paper Series No 04/2015

ISSN: 2031-4892



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Online social networks and trust[1]

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Abstract

We explore how participation in social networking sites (SNS) such as Facebook and Twitter affects the most economically relevant aspect of social capital, trust. We use measures of trust in strangers (or social trust), trust in neighbours and trust in the police. We address endogeneity in the use of SNS by exploiting the variation in the availability of broadband for high-speed Internet, which relates to technological characteristics of the pre-existing voice telecommunication infrastructures.

We find that all the proxies of trust significantly decrease with participation in online networks. We discuss several interpretations of the results in light of the specific features of Internet-mediated social interaction.

Keywords: Internet; broadband; online networks; social networking sites; Facebook; trust; social capital; hate speech.

JEL Codes: C36, D85, O33, Z1

[1] We are indebted to Angelo Antoci, Ronald F. Inglehart, Eduard Ponarin, Luca Stanca, Christopher Swader and Christian Welzel for useful comments and suggestions. The paper also benefited from comments by Anna Amalkaeva, Hermann Dülmer, Anna Nemirovskaya, Thomas H. Sander, by participants at the 3rd LCSR International Workshop (Saint Petersburg, 26–30 April 2013), at the conference 'Cultural and Economic changes under cross-national perspective' (Moscow, 12–16 November 2013), at the workshop 'Social and cultural changes in comparative prospect: values and modernization' (Moscow, 29 March–6 April 2014), at the 2014 Global Economic Symposium (Kuala Lumpur, 9 September 2014), at the workshop 'Social capital, institutions and economic performance' (Valencia, 24 October 2014), and at seminars in Latina, Luxembourg City, Milan, and Rome. Usual caveats apply.

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1. Introduction

Studies in the social capital literature have documented two stylised facts. In the years that preceded the social networking revolution, indicators of social capital, including face-to-face interaction and social trust, had declined in many OECD countries (Bartolini et al., 2013; Costa and Kahn, 2003; Putnam, 2002; Sarracino, 2010). More recently, the success of social networking sites (SNS) such as Facebook and Twitter has resulted in a steep rise in Internet-mediated interaction (Antoci et al. 2013a; 2013b; Brenner and Smith, 2013).

According to the Pew Research Center (PRC) Internet & American Life Project Survey, as of September 2014, 71 per cent of online adults were active on Facebook, 23 per cent used Twitter, 28 per cent used Pinterest and 26 per cent used Instagram. Facebook is by far the most popular platform: 79 per cent of those who use just one site report using Facebook. A significant majority of Twitter, Instagram, and Pinterest users say they also use Facebook more than any other site. Facebook users are highly engaged with the platform: 70 per cent say they use Facebook daily (including 45 per cent who do so several times a day). Most Facebook users are actively engaging with their networks on the site. As opposed to simply reading or viewing content, 65 per cent of Facebook users frequently or sometimes share, post or comment on Facebook. (Duggan et al., 2015). These figures mark a dramatic increase from 2009, when the PRC first began collecting data on Internet use. At that time, 46 per cent of online adults had ever used a SNS (Duggan and Brenner, 2013).

Despite the extent of these transformations, the impact of online networks on social capital has so far never been systematically analysed in the literature. It is not clear whether in the 'social networking era' Internet usage may accelerate the decline in social capital, or whether it offers a way to support it against the threats posed by the disruption of ties and the weakening of community life. Moreover,

while there are studies on general Internet use and social capital, existing research on the role of SNS use tends to be limited and anecdotal.

We innovate the literature by carrying out the first study on the effect of SNS use on trust. Our main research objective is to investigate whether online networking can support or, by contrast, destroy trust in others.

We use pooled cross-sectional data, including the 2010 and 2011 waves of the Multipurpose Survey on Households (MHS) provided by the Italian National Institute of Statistics (Istat). This survey contains information on SNS use and social capital in a nationally and regionally representative sample of approximately 50,000 individuals.

Due to the cross-sectional nature of our data we cannot exclude the possibility that online networking may be endogenous to trust. For example, people who are more trusting may have a higher propensity to develop networking activities online. We turn to estimates with instrumental variables to sort out causality. We exploit data on the availability of broadband for high-speed Internet a few years before the collection of MHS data to instrument the use of SNS. We illustrate in Section 4.1 how Italy's orography caused a significant variation in the technological characteristics of the pre-existing voice telecommunication infrastructures that, many years later, caused differences in the coverage of fast Internet across regions. These differences are likely to be exogenous to trust and not driven by individuals' propensity for online networking.

Ordered probit and IV estimates show that participation in SNS is significantly and negatively associated with the three types of trust.

The paper proceeds by explaining the motivation for the study and reviewing the literature on social capital (Section 2) and Internet-mediated interaction (Section 3). Section 4 describes our data and method. Section 5 deals with endogeneity issues. The empirical results are presented in Sections 6 and 7. Section 8 is devoted to the interpretation of results. The conclusion briefly discusses the limitations of the study and its implications for future research.

2. The decline in social capital

Social capital is generally referred to as all 'features of social life – networks, norms, and trust – that enable participants to act together more effectively to pursue shared objectives' (Putnam, 1995, p. 67). The literature has provided evidence that social capital is a multidimensional construct that operates at both the community and the individual level, but primarily displays its effects at the micro level. Bourdieu (1980) argued that actors, whether groups or individuals, use relationships as means to increase their ability to advance personal interests. According to Portes (1998), when members of a group hold norms and values, such as mutual trust, they can be considered to have a form of social capital that can be used as an asset in the pursuit of their goals. Coleman (1990) explained that relationships qualify as social capital when they produce and maintain normative orientations that lead to behavioral outcomes that enable individuals and groups to achieve desired outcomes. The literature has provided so many definitions of social capital that clarifying the dimensions of the concept has long been a research priority (Sabatini, 2015). Uphoff (1999) proposed a distinction between structural and cognitive dimensions: structural social capital concerns individuals' behaviours and mainly consists of social participation through various kinds of interpersonal interaction, from informal meetings with friends to active membership in formal organisations. Cognitive social capital derives from individuals' perceptions resulting in trust, values and beliefs that promote pro-social behaviour. In this paper we focus on the cognitive dimension of social capital to investigate how online networking relates to trust.[4] There are several reasons to consider trust worth investigating in economics. Trust has been credited with reducing transaction costs, promoting the enforcement of contracts, facilitating credit at the level of individual investors and encouraging innovation and investment in human and physical capital (see

[4] Both the structural and cognitive dimensions include several sub-dimensions, whose relationships with outcome variables in turn vary according to the context and the effect of other individual and local potentially influential factors (Sabatini, 2008; Degli Antoni and Sacconi, 2009; 2011; Yamamura, 2011). In addition, structural and cognitive dimensions influence each other.

among others Knack and Keefer, 1997; Christoforou, 2010; Zak and Knack, 2011; Bjørnskov, 2006; 2012; Dincer and Uslaner, 2010; Peirò-Palomino and Tortosa-Ausina, 2013). The recognition of trust as a fundamental asset for economic action is deeply rooted in the history of economic thought. In *The Theory of Moral Sentiments*, Smith (1759) argued that there were certain virtues, such as trust and a concern for fairness, that, due to their role in the discouragement of cheating, were vital for the functioning of a market economy. Smith described trust as a critical foundation of the early beginnings of the market, allowing the development of trade and economic activities. In *Principles of Political Economy*, John Stuart Mill (1848) shared the belief that trust plays a crucial role in the economic performance of nations. In contemporary political economy, the role of trust has been emphasised by Arrow (1972) and North (1990). In a famous paper, Arrow (1972) stated that: 'Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence' (1972, p. 357). Knack (2002) argues that, 'Where social mechanisms for the efficient resolution of prisoners' dilemma and principal-agent games are weak or absent (i.e. where most potential pairs of economic transactors cannot trust each other) the private returns to predation increase while the private returns to production fall' (p. 171).

How has trust performed in recent years? In his best-seller *Bowling Alone*, Robert Putnam (2000) draws on various sources to document that a decline in measures of social capital – such as participation in formal organisations, informal social connectedness, and interpersonal trust – began in the United States in the 1960s and 1970s, with a sharp acceleration in the 1980s and 1990s.

Putnam's 'decline of community life thesis' (Paxton, 1999, p. 88) prompted a number of subsequent empirical tests. Based on the General Social Surveys (GSS) data for the period 1975–94, Paxton (1999) finds some decline in the general measure of social capital (given by a combination of trust and membership in associations), a decline in interpersonal trust and no decline in associations. Costa and

Kahn (2003) use a number of different sources to assess the development of social capital in the United States since 1952 by evaluating trends in participation and community life. The authors find a decline in indicators of volunteering, membership in organisations and entertainment with friends and relatives. Based on GSS data, Bartolini et al. (2013) find a declining trend in indicators of perceived trustworthiness and confidence in institutions in the United States between 1975 and 2002.

Apart from the United States, there seems to be a common pattern of declining trust, political participation and organisational activity across industrialised democracies during the 1980s and 1990s, with the exception of China, Japan, Korea and the Scandinavian countries (Chen and Gao, 2013; Lee, 2008; Leigh, 2003; Listhaug and Grønflaten, 2007). Declining trends of social trust have been documented for England and Wales over the period 1972–99 (Li et al., 2003), Great Britain over 1959–90 (Hall, 2010) and 1980–2000 (Sarracino, 2010) and Australia over 1960–90 (Cox, 2002).

3. The role of Internet-mediated interaction

Putnam (2000) discusses three main explanations for the decline in American social capital: 1) the reduction in the time available for social interaction – related to the need to work more, to the rise in labour flexibility and to the increase in commuting time in urban areas; 2) the rise in mobility of workers and students; and 3) technology and mass media.

In the last decade, Putnam's arguments have found support in a number of studies investigating the effect exerted on various dimensions of social connectedness by the rise in working time (Bartolini and Bilancini, 2011), labour mobility (Routledge and von Ambsberg, 2003), urban sprawl and commuting (Besser et al., 2008; Wellman et al., 2001), and the social poverty of the surrounding environment, which can prompt individuals to pursue social isolation (Bartolini and Bonatti, 2003; Antoci, Sacco and Vanin, 2007; Antoci, Sabatini and Sodini, 2012b; 2013a; 2013b).

Putnam's argument about the role of technology and media in the evolution of social interaction, on the other hand, is controversial. The author's explanation of the possibly negative role of technology centres on the socially detrimental effects of television and other forms of 'private' entertainment such as video games. This concern was shared by the early sociological literature on Internet use, which developed two main arguments.

First, the more time people use the Internet for leisure, the more time has to be detracted from social activities like communicating with friends, neighbours and family members. The resulting weakening of community life may have detrimental effects on trust (Nie, 2001; Nie et al., 2002; Gershuny, 2003; Wellman et al., 2001). This argument was proposed by studies that date back to shortly before the explosion of online networking. At that time, using the Internet was predominantly a solitary pastime like watching TV or reading newspapers.

A second argument relies on the concept of 'community without propinquity' (Webber, 1963) and on the earlier theories of the Chicago School of Sociology. In a famous paper, Wirth (1938) claimed that any increase in the heterogeneity of the urban environment would provoke the cooling of 'intimate personal acquaintanceship' and would result in the 'segmentation of human relations' into those that were 'largely anonymous, superficial, and transitory' (Wirth, 1938, p. 1). This argument can be easily applied to the Internet, which seems to have the potential to fragment local communities into new virtual realities of shared interest that may negate the necessity of face-to-face encounters (Antoci et al., 2012a; 2013a). The 'crowding out' and the 'anonymisation' hypotheses, however, have not found support in more recent empirical studies.

Using a 1998 survey by the Pew Center for The People and The Press and a 2000 survey by the Pew Internet and American Life Project, Uslaner (2004) finds evidence neither of the crowding-out effect nor of any significant association between Internet use and lack of trust.

Based on data drawn from the 2008 section of the German Socio-Economic Panel and confidential data provided by Deutsche Telekom, Bauernschuster et al. (2014) find that having broadband Internet

access at home has positive effects on individuals' social interactions, manifesting in a higher frequency of visiting theatres, opera and exhibitions, and in a higher frequency of visiting friends. The authors address endogeneity issues by instrumenting broadband access through the availability of appropriate infrastructures, which was in turn related to an unforeseeable 'technological accident' that exogenously jeopardised individuals' access to broadband. Exploring a sub-sample of children aged 7 to 16 living in the sampled households, the authors further find evidence that having broadband Internet access at home increases the number of children's out-of-school social activities such as learning sports, ballet, music, painting or joining youth clubs.

Using data on Italian municipalities, Campante et al. (2013) find that the impact of broadband availability on political participation 'changes over time and is crucially affected by the reaction of the political supply side' (p. 3). The authors show that the diffusion of broadband led, initially, to a significant decline in electoral turnout in national parliamentary elections between 1996–2001 (pre-broadband) and 2006–2008 (post-broadband). This initial negative effect of Internet on turnout was largely reversed in the following elections, held in 2013. Falck et al. (2012) conduct a similar analysis drawing on data on German municipalities. The authors find that an increase in DSL availability significantly decreases voter turnout. Analysing German municipality-level data for the period 2002–2005, Czernich (2012) obtains the opposite result that Internet broadband fosters electoral participation. These studies add to the literature by addressing the role of broadband Internet in forms of participation at the individual and local level. However, due to lack of data, their authors could neither tackle the role of online networking, nor could they study the effect of the Internet on trust – the only exception being the study by Uslaner (2004), which was conducted before the advent of SNS and could not assess their possible role.

We contribute to this literature by providing the first attempt to assess the effect of online networking – in the form of participation in online social networks such as Facebook and Twitter – on trust in a large

and representative sample of the Italian population.

4. Data and methods

We use a pooled cross-section of data drawn from the 2010 and 2011 waves of the Multipurpose Survey on Households (MHS) provided by the Italian National Institute of Statistics (Istat). This survey investigates a wide range of social behaviours and perceptions by means of face-to-face interviews with a nationally and regionally representative sample of approximately 24,000 households, roughly corresponding to 50,000 individuals.

We measure trust with two sets of indicators: 1) social trust, following the wording of Rosenberg (1956). 2) Likelihood that a lost wallet is returned by 'a stranger', 'a neighbour' and 'the police'.

Social trust ($social\_trust_i$), is measured by binary responses to the question: 'Do you think that most people can be trusted, or that you can't be too careful in dealing with people?' as developed by Rosenberg (1956). In addition, we employ as dependent variable a further indicator of social trust drawn from the so-called 'wallet question': 'Imagine you lost your wallet with your money, identification or address in your city/area and it was found by someone else. How likely do you think your wallet would be returned to you if it were found by a neighbour/the police/a stranger?' Possible responses were: 'Very likely', 'Fairly likely', 'Not very likely', and 'Not likely at all'. As reported in Helliwell and Wang (2011), this measure of trust was solidly validated by experimental evidence. We reversed the scale, so that larger values indicate greater trust in unknown others.

The use of SNS is given by a dichotomous variable capturing respondent *i*'s participation in social networking sites such as Facebook and Twitter. Unfortunately, MHS data neither distinguish between Facebook and Twitter, nor contain information on the activities users actually carry out within these networks.

To explore the relationship between the binary measure of social trust and SNS use we first employed a probit model with robust standard errors reporting marginal effects.

For individual *i*, the trust equation is:

$$social\_trust_i = \begin{cases} 1 & if \quad y_i > 0 \\ 0 & if \quad y_i < 0 \end{cases} \tag{1}$$

Where $y_i = \alpha + \beta_1 \cdot fb_i + \theta \cdot X_i + \varepsilon_i$, $\varepsilon_i \sim N(0,1)$.

In equation 1, *fb* is SNS use, and *X* is a vector of other covariates.

The relationship between online networks and the categorical indicators of trust given by responses to the wallet question was investigated through an ordered probit model with robust standard errors reporting marginal effects. If the dependent variable is ordered in *K* categories, then the model for trust is:

$$y_i = \begin{cases} 1 & if \quad y_i \le 0 \\ 2 & if \quad 0 < y_i \le c_1 \\ 3 & if \quad c_1 < y_i \le c_2 \\ \cdot & \\ \cdot & \\ \cdot & \\ K & if \quad c_{K-1} < y_i \end{cases} \tag{2}$$

Where $0 < c_1 < c_2 < \ldots < c_{K-1}$; , $y_i = \alpha + \beta_1 \cdot fb_1 + \theta \cdot X_i + \varepsilon_i$, $\varepsilon_i \sim N(0,1)$. c_{K-1} are unknown parameters to be estimated, and θ is a vector of parameters for the vector of control variables X_i.

Table 1. Descriptive statistics

Variables	Obs	Mean	St. dev.	Min	Max
Woman	79433	0.521	0.500	0	1
Age	79433	50.11	18.21	18	90
Commuting (log minutes)	36108	3.216	1.375	0	7.610
TV watching (log minutes)	59924	5.059	0.577	2.303	6.835
Single	79433	0.278	0.448	0	1
Divorced	79433	0.0692	0.254	0	1
Widow	79433	0.916	0.289	0	1
Medium-level education	79433	0.358	0.479	0	1
High-level education	79433	0.00786	0.0883	0	1
Unemployed	79433	0.0907	0.287	0	1
Children in the household	79433	1.011	1.009	0	7
Year	79433	-	-	2010	2011
Region	79433	-	-	10	200

Real GDP per capita (thousands €2005)	79433	22.91	5.746	14.88	30.77

The list of control variables includes:

- The kind of technology that respondents used to connect to the Internet. Possible categories were cable broadband (optical fibre, intranet, PLC, etc.), satellite or other wireless connections (e.g. Wi-Fi and Wi-max), wireless connection through tablets and/or mobile phones employing 3G mobile telecommunication technology, wireless connection employing a 3G modem (e.g. a USB key), or connection with a WAP or a GPRS mobile phone.
- Age, gender, marital status, number of children, education, work status,[5] the time spent in commuting and the time spent on watching TV (in minutes).

We accounted for commuting for two reasons. First, the time spent on commuting may be subtracted from social interactions. Second, it may be considered as a proxy for spatial fragmentation, which allows us to test one of Putnam's claims about the detrimental effects of the spread of modern cities. In the author's words: 'It is not simply time spent in the car itself, but also spatial fragmentation between home and workplace, that is bad for community life' (Putnam, 2000, pp. 213–14).

We controlled for TV watching to further test Bruni and Stanca's (2008) findings about the detrimental effect of television on watchers' relational activities and Mutz and Reeves's (2005) findings about the role of television in declining trust in the U.S.

A summary of descriptive statistics is presented in Table 1.

[5] Possible work statuses were: employed, unemployed looking for a job, first job seeker, household, student, disabled worker, retired worker, other.

5. Endogeneity issues

The coefficients from equations (1) and (2) indicate the sign and magnitude of partial correlations among variables. However, we cannot discard the hypothesis that online networking is endogenous to trust. Individual features such as personal characteristics may be correlated with both the use of SNS and our indicators of trust. For example, people who have a higher propensity to trust strangers may also be less concerned with the privacy issues related to the use of platforms like Facebook. Reverse causality might also arise. For example, open-minded people responding that most people can be trusted may be encouraged to join online networks with the explicit purpose of establishing new friendships. By contrast, individuals who trust strangers less may find SNS less attractive.

To deal with such problems, we turn to instrumental variables estimates using a two stage least squares (2SLS) model where, in the first stage, we instrument our measure of online networking.

A reliable instrumental variable must meet at least two criteria. First, it must be theoretically justified and statistically correlated with online networking ('relevance' condition), after controlling for all other exogenous regressors. Second, it must be uncorrelated with the disturbance term of the trust equation ('orthogonality' condition). We identified two econometrically convenient instruments: 1) The percentage of the population for whom a DSL connection was available in respondents' region of residence according to data provided by the Italian Ministry of Economic Development. DSL (digital subscriber line, originally digital subscriber loop) is a family of technologies that provides Internet access by transmitting digital data over the wires of a local telephone network. Basically, it is a way to improve the speed of data transmission through old telephonic infrastructures. 2) A measure of the digital divide given by the percentage of the region's area that was not covered by optical fibre, elaborated from data provided by The Italian Observatory on Broadband. Optical fibre permits transmission over longer distances and at higher bandwidths (data rates) than other forms of

communication. Both instrumental variables were measured in 2008, two years before the first wave of the Multipurpose Household Survey, which we employ in our study.

DSL technology relies on the transmission of data over the user's copper telephone line, i.e. over pre-existing voice telecommunications infrastructures. However, the existence of a telephone infrastructure is just a necessary and not a sufficient condition for the availability of broadband. What matters is the so-called 'local loop', i.e. the distance between final users' telephone line and the closest telecommunication exchange or 'central office' (Falck et al., 2014; Czernich, 2012; Campante et al., 2013). The longer the copper wire, the less bandwidth is available via this wire. If the distance is above a certain threshold (approximately 4.2 kilometres), then the band of the copper wires serving telephone communications cannot be wide enough to support a broadband connection (Falck et al. 2014; Czernich, 2012). This is the case in most Italian rural areas, which constitute more than half of the Italian territory and are often composed of isolated and sparsely populated highlands or hills. In 2007 these areas were generally characterised by the high length ($\geq$ 4.2 kilometres) of local loops, which ultimately depended on the imperviousness of the territory. As a consequence, these areas in most cases lacked the infrastructures needed for the diffusion of DSL broadband (Ciapanna and Sabbatini, 2008; Agcom, 2011).

The distribution of broadband infrastructures in 2008 can be reasonably considered as exogenous to individuals' trust – whether in strangers, the neighbours or the police – in 2010–11 because it strictly depended on local loops, whose location was determined several decades before the advent of the Internet, based on the orographic features of the territory (Agcom, 2011; Campante et al., 2013). Moreover, given the rigid Italian real estate market, it is reasonable to assume that people have little possibility of choosing where to live. Hence, it is hard to believe that people who desire fast Internet might choose to move in search of better Internet connections. In Figure 4 in the Appendix, we report a comparison between a map illustrating the orographic characteristics of the Italian territory and a map of broadband coverage in 2007, which suggests that, in Italy, the most impervious territories are those

with the worst broadband coverage.

The availability of DSL infrastructures in the area, in fact, creates the premise for the individual choice to purchase a fast-speed access and, subsequently, to develop online interactions that may affect trust. On the other hand, one could argue that individuals who exhibited a positive propensity for participation in SNS in the 2010–11 period may have had a higher propensity for promoting actions aimed at extending the regional broadband coverage in 2008. However, as mentioned above, the reasons for the digital divide across Italian regions are basically linked to the orographic, exogenous features of the territory. In addition, it must be noted that in Italy, Facebook, Twitter and other social networking sites only boomed after 2008.[6]

It is, therefore, reasonable to assume that the 2008 level of regional DSL coverage cannot *per se* exert a direct influence on the trust of individuals and that broadband coverage may affect trust solely to the extent to which accessing broadband allows Internet-mediated communication.

To further check the validity of this instrument, we reviewed the literature and found that DSL coverage in the region of residence has never been found to be correlated with trust at the individual level (Bauernschuster et al. 2014; Falck et al., 2014; Czernich 2012; Campante et al., 2013). The availability of appropriate technological infrastructures in the area of residence has been used by Bauernschuster et al. (2014) to instrument the individual choice to purchase broadband access for connecting to the Internet. Similar instruments were used in municipality-level studies on electoral participation by Falck et al. (2014), Czernich (2012) and Campante et al. (2013).

The arguments supporting the assumption of the orthogonality of the share of the population covered by DSL are even stronger for the second instrument. When the broadband connection cannot be implemented through pre-existing copper wires, it is necessary to turn to an optical fibre-based technology. The possibility and the costs of installing this type of infrastructure, however, rely even

[6] According to data provided by Facebook Advertising Platform, in January 2008 Facebook had 216,000 subscribers in Italy. As of October 2013, the network officially reports having 26,000,000 subscribers.

more strongly on the exogenous characteristics of the natural environment. Differently from DSL, in fact, optical fibre entails the need to install new cables underground. This involves excavation works, which are expensive and generally delay or even prevent the provision of broadband in the area. As for DSL, orographic differences between regions must be considered as a 'natural' cause of the variation in access to fibre across regions that is exogenous to people's trust and cannot be driven by their preference for online networking.

The tests of over-identifying restrictions we run in the context of IV estimates do not disconfirm the assumption of the orthogonality of the instruments (see Section 6).

For any given set of orographic characteristics of an area, the provision of broadband – whether through DSL or optical fibre technology – may also have been influenced by some socio-demographic factors that affected the expected commercial return on the provider's investment, such as population density, per capita income, the median level of education and the local endowments of social capital. These characteristics could be expected to correlate with our outcomes of interest in ways that could confound causal interpretation. To account for the confounding effect of these characteristics, we included the regional level of per capita GDP in our regressions.

Regarding the relevance of the instruments, the discussion about how the digital divide may influence SNS is not trivial. There are in fact two ways in which the digital divide can influence individuals' propensity for online networking. On the one hand, it can be argued that the bigger the area covered by fast Internet infrastructures, the higher should be the individual propensity for online networking. However, in areas where broadband access is less widespread, the use of SNS is a scarce commodity. In these places the demand for broadband may be higher, as consumers are keen to participate in SNS with any available device. If this is the case, the individual propensity for networking might be positively correlated with the scarcity of broadband.

The relevance of instruments will be further discussed in Section 7 (presenting results of IV estimates), as it is strictly related to evidence from the first step of IV regressions.

6. Results

Table 2 presents estimates of equation (1) on social trust. Networking via SNS is significantly and positively associated with social trust.

In Table 3 we report estimates of equation (2), where we use the responses to the wallet question as proxies of trust in others. The indicator of online networking is found to be significantly and negatively correlated with trust in strangers. It does not significantly correlate with trust in neighbours, and it is significantly and negatively associated with trust in the police. When the wallet question is employed, women exhibit significantly higher levels of trust in strangers, in neighbours and in the police.

Table 2. SNS use and social trust measured through the Rosenberg question: probit estimates		
	Most people can be trusted	
Type of connection to the Internet		
DSL	0.0109 (0.33)	0.00307 (0.08)
Fibre	0.0657 (0.82)	0.0683 (0.79)
Satellite	0.111** (2.47)	0.0802 (1.62)
3G	0.000116 (0.00)	-0.0136 (-0.18)
USB	-0.00567 (-0.15)	0.0123 (0.28)
Mobile	-0.0225 (-0.31)	-0.0221 (-0.28)
Main demographic, social and economic characteristics		
Women	-0.0245 (-1.26)	-0.0312 (-1.47)
Age	0.0136*** (12.49)	0.0186*** (14.84)
Single	0.106*** (3.89)	0.0911** (3.16)
Divorced	0.0321 (0.83)	0.0108 (0.25)
Widowed	-0.0388 (-0.41)	-0.0607 (-0.54)
Medium level of education	0.0358* (1.86)	-0.0200 (-0.95)
High level of education	0.512*** (7.29)	0.408*** (5.64)
Unemployed	0 (.)	0 (.)
Children in the household	0.000527 (0.05)	0.0184 (1.59)
Other controls		
Commuting (log minutes)	0.0159** (2.23)	0.00289 (0.38)
TV watching	-0.127*** (-7.16)	-0.130 *** (-6.75)
Real per capita GDP	-0.0913 (-1.05)	-0.0505 (-0.53)
Indicator of online networking		
Use of SNS		0.0834*** (3.62)
Constant	1.827 (0.80)	0.652 (0.26)
Observations	20632	17054
Pseudo R^2	0.027	0.031

Regressions include socio-demographic and year controls: variables are omitted for the sake of brevity and are available upon request from the authors.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$

Table 3. SNS use and forms of trust measured through the 'wallet question': ordered probit estimates

Likelihood that the wallet will be returned by:	A stranger	A stranger	A neighbour	A neighbour	The police	The police
Type of connection to the Internet						
DSL	0.0261 (0.93)	0.0278 (0.87)	0.0569** (2.09)	0.0485 (1.56)	-0.0420 (-1.52)	-0.0351 (-1.12)
Fibre	0.0867 (1.38)	0.113* (1.69)	0.149** (2.23)	0.178** (2.48)	-0.0614 (-0.90)	0.00949 (0.13)
Satellite	0.0558 (1.45)	0.0625 (1.46)	0.195*** (5.25)	0.165*** (3.97)	-0.0694* (-1.83)	-0.0760* (-1.80)
3G	0.0892 (1.58)	0.102* (1.65)	0.0746 (1.35)	0.0851 (1.41)	0.0623 (1.07)	0.0840 (1.31)
USB	-0.0109 (-0.34)	-0.00403 (-0.11)	0.00499 (0.16)	-0.0147 (-0.41)	-0.120*** (-3.79)	-0.103** (-2.88)
Mobile	0.0124 (0.21)	0.0243 (0.37)	0.0937 (1.63)	0.0896 (1.41)	-0.0373 (-0.64)	-0.0318 (-0.49)
Main demographic, social and economic characteristics						
Women	0.0540*** (3.33)	0.0565** (3.17)	0.0417** (2.65)	0.0571** (3.29)	0.0517** (3.23)	0.0718*** (4.06)
Age	0.0108*** (11.92)	0.0133*** (12.77)	0.00105 (1.17)	0.00405*** (3.92)	0.00839*** (9.04)	0.00990*** (9.21)
Single	0.0781*** (3.50)	0.0889*** (3.69)	-0.0630** (-2.84)	-0.0711** (-2.96)	-0.0588** (-2.58)	-0.0621** (-2.52)
Divorced	-0.0308 (-0.91)	-0.0466 (-1.26)	-0.121*** (-3.68)	-0.130*** (-3.56)	-0.0714** (-2.13)	-0.0905** (-2.40)
Widowed	-0.000569 (-0.01)	-0.0144 (-0.15)	-0.120 (-1.41)	-0.132 (-1.33)	0.00477 (0.05)	0.0440 (0.41)
Medium level of education	0.0336** (2.09)	-0.00273 (-0.15)	0.0547*** (3.51)	0.0265 (1.53)	0.0476** (2.98)	0.0232 (1.32)
High level of education	0.344*** (6.17)	0.281*** (4.82)	0.289*** (4.32)	0.232*** (3.38)	0.212** (3.09)	0.158** (2.25)
Unemployed	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
Children in the household	0.00787 (0.90)	0.0212** (2.20)	0.0157* (1.86)	0.0268** (2.87)	-0.00509 (-0.58)	0.00302 (0.31)
Other controls						
Commuting (log minutes)	0.00972 (1.62)	0.000716 (0.11)	-0.00852 (-1.44)	-0.0114* (-1.80)	-0.00951 (-1.60)	-0.0110* (-1.72)
TV watching	-0.130*** (-8.52)	-0.133*** (-7.91)	-0.0793*** (-5.28)	-0.0703*** (-4.25)	-0.0196 (-1.27)	-0.0158 (-0.93)
Real per capita GDP	0.0410 (0.56)	0.0121 (0.15)	0.0528 (0.77)	0.0615 (0.81)	0.103 (1.44)	0.131* (1.65)
Indicator of online networking						
Use of SNS		-0.0367* (-1.90)		0.0179 (0.95)		-0.0368* (-1.91)
Cut 1 Constant	0.677 (0.35)	-0.0914 (-0.04)	-0.649 (-0.36)	-0.320 (-0.16)	0.967 (0.52)	1.737 (0.84)

Cut 2 Constant	1.974 (1.04)	1.238 (0.59)	0.114 (0.06)	0.445 (0.22)	1.712 (0.92)	2.486 (1.20)
Cut 3 Constant	2.983 (1.56)	2.304 (1.10)	1.181 (0.66)	1.529 (0.77)	2.869 (1.54)	3.649* (1.76)
Observations	20604	17048	20633	17071	20624	17063
Pseudo R^2	0.021	0.024	0.021	0.022	0.018	0.020

Regressions include socio-demographic and year controls: variables are omitted for the sake of brevity and are available upon request from the authors.
* p < 0.1, ** p < 0.05, *** p < 0.001

For instrumenting participation in SNS, we employ a two-stage model that can be described by the following two equations:

$$online\_networking_i = \pi_1 + \pi_2 \cdot dsl + \pi_3 \cdot fiber + \pi_4 \cdot W_i + v_i \quad (4)$$

$$trust_i = \alpha + \theta \cdot X_i + \gamma_1 \cdot dsl + \gamma_2 \cdot fiber + W_i + \mu_i \quad (5)$$

Where *dsl* and *fibre* are the instruments described in Section 4.

The relationship between online networking and social trust, as measured through responses to the Rosenberg question, is estimated using a probit model in both the stages of the procedure. Results are reported in Table 4.

When we use as dependent variables the answers to the wallet question, we employ a probit model in the first stage and an ordered probit model in the second stage.

To perform these estimates we used a multi-equation conditional mixed-process (CMP) estimator, as implemented by Roodman (2011). This technique allows us to adopt a different specification of the model in each stage. Results are reported in Tables 5, 6, and 7. To compare the relative magnitude of the effects of the independent variables, we computed their marginal effects. Coefficients are reported in Tables 9–12 in the Appendix.

Table 4. SNS use and social trust: marginal effects after IV estimates through CMP				
Stage	2nd stage (probit)		1st stage (probit)	
Dependent variable	Social trust		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-.5704655	.2656928**		
Type of connection to the Internet				
DSL	.050592	.0504724	3135702	.0444526
Fibre	.2365674	.1058137 **	.4478573	.1001245 ***
Satellite	.1435258	.0606623 **	.3122218	.057782 ***
3G	.1180891	.0937832	.4095122	.0873206 ***
USB	.0390776	.0510928	.1887462	.050138 ***
Mobile	.1005278	.0964267	.497327	.0861188 ***
Main demographic, social and economic characteristics				
Women	-.0660401	.0260457 **	-.1342636	.0241327 ***
Age	.0089927	.004995 *	-.0439405	.0014033 ***
Single	.1698287	.0408236 ***	.2876527	.0317227 ***
Divorced	.0749779	.0539405	.266327	.0477523 ***
Widowed	-.0693446	.1275446	.2562308	.1446357 *
Medium level of education	-.0271939	.0236139	.0142046	.0238931
High level of education	.472513	.0834133 ***	-.0720173	.0865949
Unemployed	?	?	?	?
Children in the household	.0185065	.0144833	-.0447827	.0131833 ***
Other controls				
Wave 2010	0	.	0	.
Wave 2011	-.0527482	.0262756 **	.1071923	.023831 ***
Commuting (log minutes)	.0094872	.0083726	.0031253	.0086
TV watching	-.1064779	.0251766 ***	.0964008	.0222678 ***
Real per capita GDP	.0104713	.0024117 ***	-.0044242	.0028066
Instruments				
DSL			.0129158	.0024252 ***
Fibre			.0044213	.0022061 **
Observations	17048			
* p < 0.1, ** p < 0.05, *** p < 0.001				

Table 5. SNS use and social trust measured through the 'wallet question': marginal effects after IV estimates with CMP				
Stage	2nd stage (ordered probit)		1st stage (probit)	
Dependent variable	Trust in strangers		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-.8989009	.0958191 ***		
Type of connection to the Internet				
DSL	.1355658	.0369043 ***	.3051196	.0443579 ***
Fibre	.2439012	.0814627 **	.4289321	.0983045 ***
Satellite	.1620081	.0483865 ***	.3192909	.0578516 ***
3G	.2404427	.0693729 ***	.3714463	.0882899 ***
USB	.0821813	.0413044 **	.1877444	.0500027 ***
Mobile	.1838062	.0746716 **	.4838944	.0858874 ***
Main demographic, social and economic characteristics				
Women	.0104895	.0204972	-.1263073	.0239145 ***
Age	-.0002904	.0020841	-.0440515	.0013987 ***
Single	.1707085	.0284905 ***	.2831504	.0315649 ***
Divorced	.0156594	.0425006	.2543769	.0476021 ***
Widowed	-.0004214	.0991437	.2654581	.144001 *
Medium level of education	-.0020327	.0198558	.0180112	.0238241
High level of education	.2339116	.06041 ***	-.0735977	.0855928
Unemployed				
Children in the household	.0095255	.0111652	-.0491316	.0130728 ***
Other controls				
Wave 2010	0	.	0	.
Wave 2011	-.0258572	.0202956	.1093415	.0237546 ***
Commuting (log minutes)	-.0063684	.0073161	.0024027	.0086011
TV watching	-.1065562	.0197159 ***	.0934127	.0222251 ***
Real per capita GDP	.0165171	.0019334 ***	-.0025401	.002725
Instruments				
DSL			.0180883	.0024385 ***
Fibre			.0071548	.0020243 ***
Observations	17701			
* p < 0.1, ** p < 0.05, *** p < 0.001				

Table 6. SNS use and trust in neighbours measured through the 'wallet question': marginal effects after IV estimates with CMP

Stage	2nd stage (ordered probit)		1st stage (probit)	
Dependent variable	Trust in neighbours		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-.8140574	.082582 ***		
Type of connection to the Internet				
DSL	.143597	.0353755 ***	.3075767	.0438752 ***
Fibre	.3142436	.0871513 ***	.4281114	.0985165 ***
Satellite	.2465773	.0463825 ***	.3119207	.0573923 ***
3G	.1805791	.0704934 **	.376591	.0859326 ***
USB	.0693364	.0401113 *	.1849206	.0496605 ***
Mobile	.2380509	.0709864 ***	.4752287	.086678 ***
Main demographic, social and economic characteristics				
Women	.002778	.0198626	-.1288182	.023906 ***
Age	-.0082867	.0017304 ***	-.0443154	.0013996 ***
Single	.0364628	.0291333	.2811374	.0315436 ***
Divorced	-.0197616	.0416241	.2519293	.0478782 ***
Widowed	.0079379	.1098201	.2492322	.1495227 *
Medium level of education	.0283187	.0194442	.0100691	.0238216
High level of education	.1580989	.0729199 **	-.0781552	.086988
Unemployed				
Children in the household	.009108	.0107599	-.0472924	.0130961 ***
Other controls				
Wave 2010	0	.	0	.
Wave 2011	-.0360276	.0196634 *	.1039382	.0237496 ***
Commuting (log minutes)	-.0190078	.0070203 **	.0009169	.0086161
TV watching	-.0423132	.0188357 **	.0949892	.0222727
Real per capita GDP	.0236082	.0018459 ***	-.0026335	.0027247
Instruments				
DSL			.0192007	.0024697 ***
Fibre			.0075557	.002044 ***
Observations	17071			

* p < 0.1, ** p < 0.05, *** p < 0.001

Table 7. SNS use and trust in the police measured through the 'wallet question': marginal effects after IV estimates with CMP

Stage	2nd stage (ordered probit)		1st stage (probit)	
Dependent variable	Trust in the police		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-.9748724	.0726166 ***		
Type of connection to the Internet				
DSL	.0806409	.0356497 **	.3152178	.043824 ***
Fibre	.1230555	.0887867	.4323277	.1005084 ***
Satellite	.0751461	.0473768	.3154556	.057283 ***
3G	.230795	.0735533 **	.3928623	.0869802 ***
USB	.0063837	.0399442	.1888239	.0494808 ***
Mobile	.1433608	.0697411 **	.4768953	.0845239 ***
Main demographic, social and economic characteristics				
Women	.0146943	.0202409	-.1330546	.0238593 ***
Age	-.0047066	.0017281 **	-.0442293	.0014056
Single	.047915	.029121 *	.2787836	.0316619
Divorced	.023052	.0430027	.2516026	.0480076 ***
Widowed	.2075286	.110576 *	.2340726	.1429143
Medium level of education	.0324005	.019701	.0150037	.0237488
High level of education	.1274662	.0789706	-.0916727	.0882913
Unemployed				
Children in the household	-.0146247	.0110033	-.0485171	.0131515 ***
Other controls				
Wave 2010	1.76e-11	.	8.37e-19	.
Wave 2011	-.0007219	.0199341	.0967177	.0237821 ***
Commuting (log minutes)	-.0164945	.0069944 **	.0027719	.0085563
TV watching	.0028132	.0190373	.0962193	.0221642 ***
Real per capita GDP	.0082134	.0018233 ***	-.0007997	.0027398
Instruments				
DSL			.0197421	.0023819 ***
Fibre			.0096984	.002038 ***
Observations	17071			

* p < 0.1, ** p < 0.05, *** p < 0.001

The first stage estimations conducted through probit models show that our instruments satisfy the relevance condition, as their coefficients are statistically significant. The F-statistics (reported at the bottom of Tables 9–12), which test the hypothesis that the coefficients of the excluded instruments are all zero in each first-stage estimate, are well above the threshold of 10 (suggested by the literature as the rule of thumb criterion of instrument strength).

To statistically test for correlation of our instruments with the error term of the structural equation (4), we ran an over-identifying restriction test. Results suggest that our set of instruments is reasonable.

Addressing endogeneity allowed us to obtain unbiased results on the possible role of online networking. As reported in Tables 4–7, we found that the use of SNS is significantly and negatively correlated with our measures of trust. The coefficients are very large, ranging from -0.57 for social trust to -0.97 for the likelihood that the police would return a lost wallet. Remarkably, the size of the marginal effects for the likelihood that a wallet is returned by a stranger or by the police is quite high: -0.89 and -0.97, respectively. This suggests that using SNS lowers by slightly less than 1 point (on a scale from 1 to 10) the answer of a respondent to the wallet question. In other words, the use of SNS increases the probability that respondents report lower trust in others compared to non-users.

Women show a significantly lower level of social trust. However, when trust is measured through the wallet question, no significant gender differences are observed. Singles and highly educated people are more likely to trust others. Such significant associations disappear for singles in the case of trust in neighbours, and for highly educated people in the case of trust in the police. TV watching is significantly and negatively associated with all the forms of trust except trust in the police, where it is not significant. The time spent on commuting is significantly and negatively associated with trust in neighbours and trust in the police. However, when the use of SNS is included in regressions, commuting loses its statistical significance.

The first stage of instrumented estimates reveals interesting correlations. Women show a significantly lower propensity for participation in online networks. The propensity for participation in SNS decreases with age. Singles and divorced people are significantly more likely to use online networks. SNS use, on the other hand, is significantly and negatively correlated with the number of children in the household, probably because of scarcity of time. Figures 1 to 4 illustrate, respectively, the marginal effect of SNS use on the probability that respondents think that most people can be trusted, and that their wallet would very likely be returned by a stranger, a neighbour, or the police. The use of SNS is represented with red rhombi. The marginal effects are reported in Table 8 in the Appendix.

Figure 1: marginal effect of SNS use on social trust

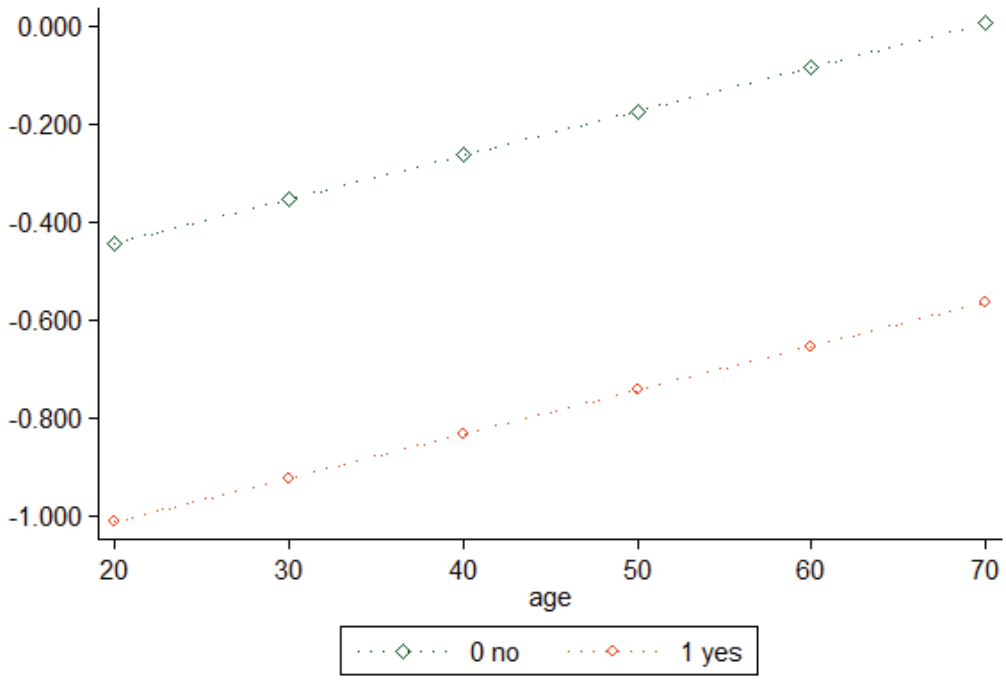


Figure 2: marginal effect of SNS use on social trust, measured through the ‘wallet question’

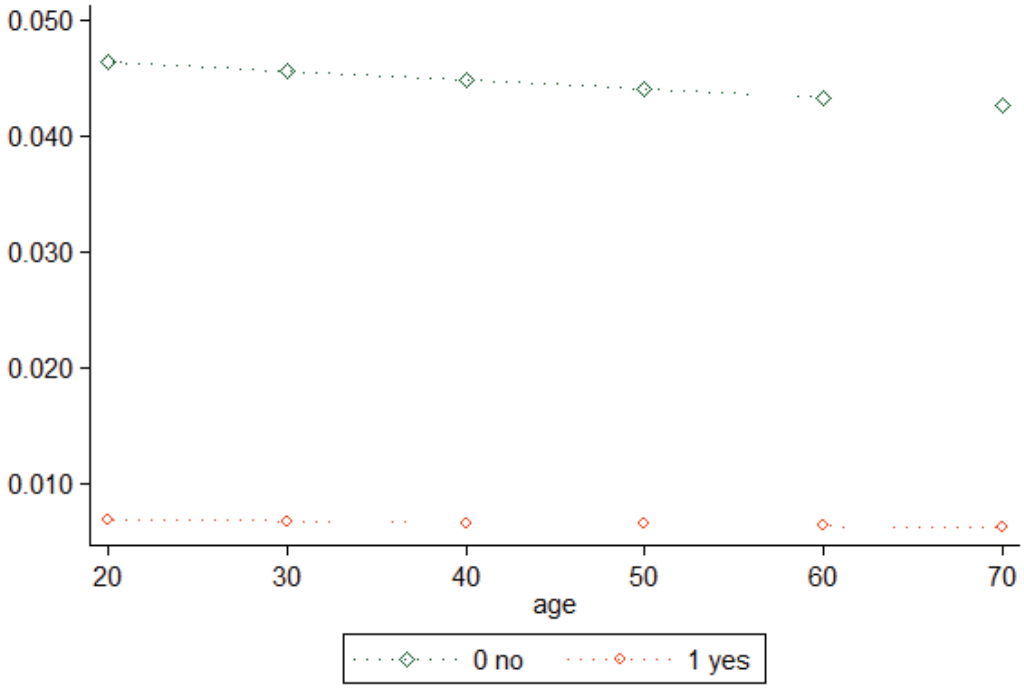


Figure 3: marginal effect of SNS use on trust in neighbours

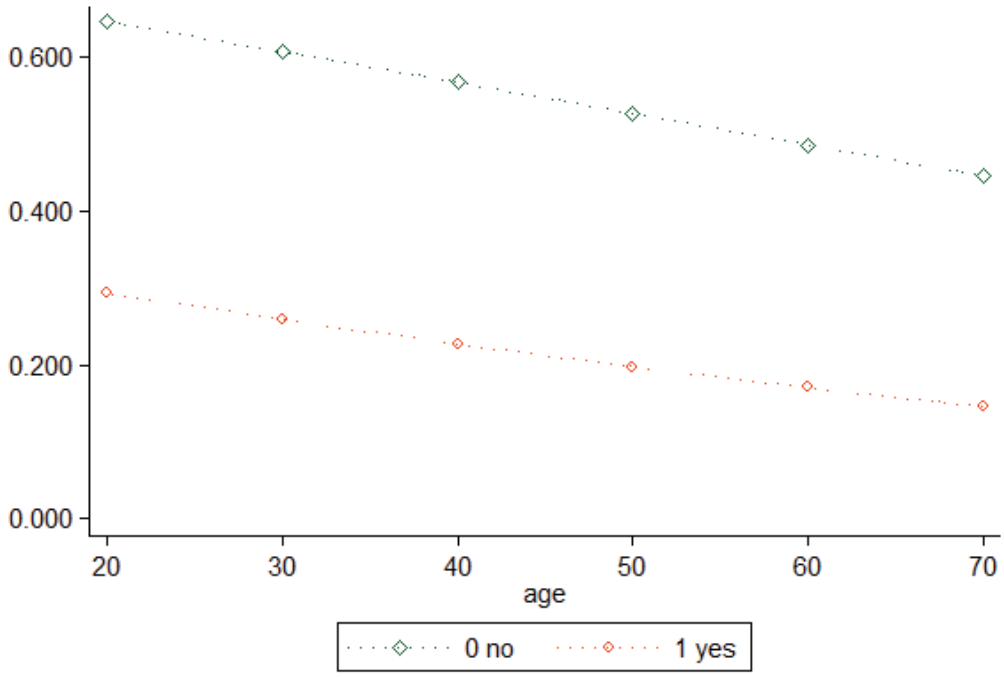
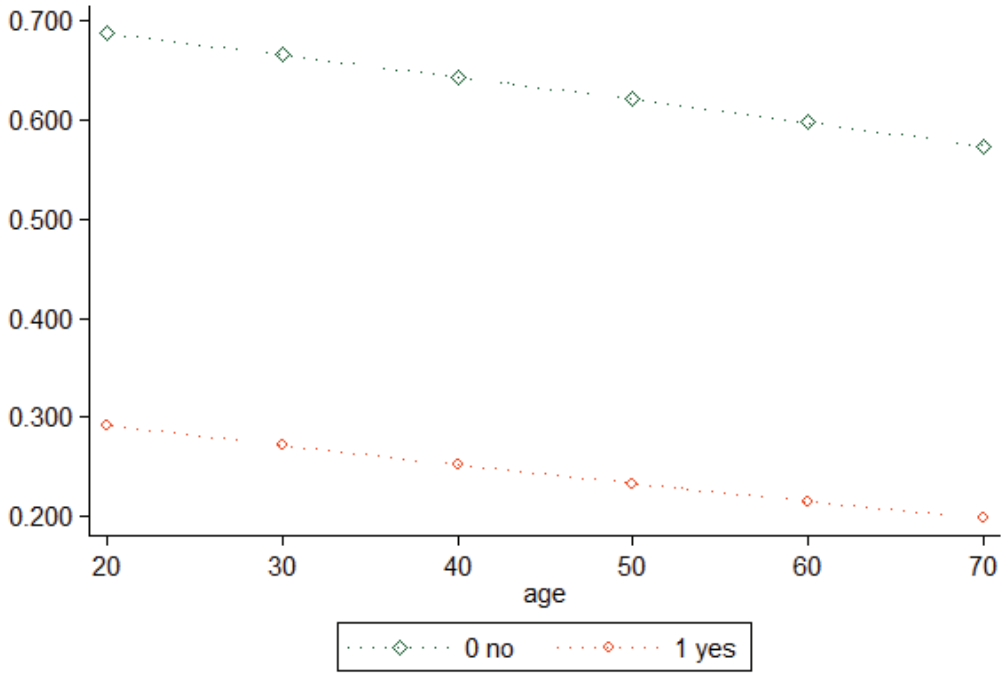


Figure 4: marginal effect of SNS use on trust in the police



7. Interpretation of results

The IV estimates suggest that the use of SNS has a detrimental effect on people's propensity to trust others. There may be several channels of transmission of this hypothetical effect.

Even if online networks allow Internet users to preserve and develop their social ties (see for example Ellison et al., 2007; Antoci et al., 2013a; Sabatini and Sarracino, 2014), they also favour new contacts with people outside of users' usual reference groups to an extent that has no precedent in the pre-social networking era. In face-to-face interactions people usually select a narrow circle of people with whom they discuss delicate topics – e.g. political and moral issues, such as those related to racism and civil rights. SNS, by contrast, propose spaces for discussion where selection mechanisms are weak or lacking. In Facebook's 'public pages', 'groups', and 'communities', as well as in commenting platforms for online magazines and newspapers (e.g. Disqus), individuals are likely to discuss with (or to witness discussions among) strangers about morally and politically sensitive topics. Think for

example of the Facebook page of a national, generalist newspaper where a very heterogeneous audience can comment on news and op-ed articles without moderation. In each thread, individuals are forced to 'meet', and may happen to be confronted with, a wide variety of points of views. For example, a homophobic individual may be confronted with people who support equality of civil rights (or vice versa), and a Real Madrid fan will probably discover that Barcelona's supporters are spread all over the world. Online interactions are likely to bring surfers into contact with a greater variety of preference types than they could ever meet in face-to-face interactions, which are generally limited to contacts within specific reference groups. In a pioneering study based on data on approximately 38 million active Twitter users in Germany, Spain, and the U.S., Barberà (2014a; 2014b) has shown that online networks expose users to a wider range of opinions than those that one would normally encounter offline.

The exposure to diversity may contribute to dismantling SNS users' 'false consensus', i.e. the tendency for people to assume that their own opinions, beliefs, preferences and values are 'normal' and that others also think in the same way (see for example Gamba, 2013). Empirical studies in economics have shown that, at least in the short run, diversity along ethnic, religious, moral and socio-economic status lines may be a source of frustration and distrust towards unknown others (Alesina and La Ferrara, 2006; Christoforou, 2011).

Another source of frustration and distrust could be related to exposure to offensive behaviours. In face-to-face settings where people disagree about sensitive (e.g. moral or political) issues, there are strong social norms likely to be observed for the purposes of these interactions. As observed by Mutz and Reeves (2005, p. 3), 'Face-to-face exchanges are relatively polite. Although people occasionally yell at one another and stomp their feet over political differences, such behaviour is far more common in mediated presentations of political views.'

In online environments, unknown strangers are basically 'invisible'. The feelings and sensitiveness of a stranger can hardly be perceived in an occasional Internet-mediated interaction. Strangers' reaction to

provocative behaviours can be easily neutralised (for example, by simply switching off the device, or even by 'blocking' them through the network's privacy settings). In addition, online conversations are more vulnerable to incomprehension and misunderstandings. Face-to-face interactions, by contrast, allow better articulation of one's expressions, gestures, tone of voice, feelings, opinions and intentions, but disallow the possibility of easily withdrawing from unpleasant conversations. While in physical interactions people usually think twice before insulting a person who expresses an opposing view, SNS users are likely to care less about the risk of offending an interlocutor in online interactions.

These arguments are consistent with descriptive evidence on SNS reported by the Pew Research Center. 73 per cent of adult Internet users have witnessed someone being harassed online, and 40 per cent have personally experienced harassment on SNS (Duggan, 2014). Based on Pew survey data about the social climate of SNS, Rainie et al. (2012) show that 49 per cent of SNS-using adults have witnessed mean or cruel behaviour displayed by others at least occasionally, and 12 per cent had an experience that resulted in a face-to-face argument or confrontation with someone. Nearly three quarter of U.S. Internet users report they have encountered forms of hate speech – such as language, images or humour that they found offensive – on SNS (Rainie et al., 2012). Minorities, women, parents of minor children, and the elderly were the groups most likely to encounter offensive language, images or humour. Of black SNS users, 42 per cent said they frequently or sometimes encountered hate speech.

It is possible that when unknown others violate interpersonal social norms and behave offensively in online environments, people's feelings are affected as if those offences were perpetrated in real life. Mutz and Reeves (2005) find that exposure to 'televised incivility' (for example, through watching political debates on TV) causes a deterioration in social trust. Present findings are compatible with the hypothesis that the same mechanism holds for 'online incivility'.

Other interesting results concern the significantly negative association between TV watching and trust. This finding seems consistent with the televised incivility argument proposed by Mutz and Reeves (2005) and suggests the need to further investigate this issue.

8. Conclusions

In this paper we have investigated how participation in social networking sites such as Facebook and Twitter may affect social trust. The empirical analysis used a pooled cross-section of data including approximately 50,000 observations from the 2010 and 2011 waves of the Istat Multipurpose Survey on Households (MHS). Our findings suggest that the use of SNS can be detrimental for social trust. Trust in neighbours and trust in the police are also significantly and negatively associated with SNS use.

The result for social trust could be interpreted as an individual reaction to offensive behaviours and to diversity, which have both been found to be sources of frustration and distrust by empirical studies. However, our interpretation is thus far merely speculative, as we do not know if respondents actually encountered aggressive behaviours, or the degree of diversity they experienced, online. In case of low exposure to online diversity, it may be possible that SNS use reinforces the false consensus, instead of dismantling it. There are further reasons to treat our findings with prudence. The pooled cross-sectional nature of the data employed in the analysis requires caution in advancing a causal interpretation of the estimates. The MHS lacks information about how much time users spend on SNS and which kinds of activities they actually engage in. In MHS data, it is not possible to distinguish between Facebook and Twitter. Even if we believe that the instruments we used to tackle endogeneity are valid, longitudinal data are needed to better identify the effect of online social networks on trust. To interpret the possible transmission mechanisms we need more comprehensive information about how individuals use online networks.

Despite these limitations, our study innovates the literature with the first empirical investigation into the possible effect of online social networks – a topic on which until now we only had anecdotal evidence – on different forms of trust, the most economically relevant aspect of social capital. The findings presented in this study highlight the need to focus future theoretical, empirical and

experimental research on the possibility that online networking may worsen trust and well-being, and to give more attention to the theme of Internet regulation, especially with regard to SNS.

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Appendix

Figure 4: Percentage of the population covered by broadband in Italy and topographic map of Italy.

Source: Between (2006, p. 17). Darker areas are those with the worst coverage. Green areas have the best coverage.

L. di Costanza
Alpi Bavaresi
Alpi di Salisburgo
Alti Tauri
Alpi Noriche
Altopiano Elvetico
Ginevra
Mura
Selva Baconia
Lago Balaton
Danubio
Drava
Monti Mecsek
Mti Pohorje
Mti Bilo
Mte Grappa
Montello
Mti Berici
Colli Euganei
Adige
Laguna Veneta
Golfo di Venezia
G. di Trieste
Friuli
Carso
Istria
Mt. Maggiore
Mti d. Uscocchi
Mt. Nevoso
P. di Vratao
Mti Kapela
Sava
Lomellina
Monginevro
Monviso
Colle di Maddalena
Argentera
Colle di Tenda
Colle di Cadibona
P. d. Giovi
Mt. Maggiorasca
Appennino Ligure
APPENNINO SETTENTRIONALE
APP. Tosco-Emiliano
Mt. Cimone
Golfo di Genova
Riviera di Levante
Riviera di Ponente
C. Mele
G. di La Spezia
C. d'Antibes
C. Camarat
Mar Ligure
I. Gorgona
Polesine
Foci del Po
Valli di Comacchio
Isole Brioni
C. Promontore
I. Unie
I. Lussino
I. Cherso
I. Arbe
I. Premuda
I. Lunga
I. Incoronata
Mare Adriatico
Alpi Dinariche
Dalmazia
Erzegovina
Bosnia
Mt. Falterona
Mt. Fumaiolo
Bocca Trabaria
Mt. Catria
Mt. Conero
Arno
Cecina
Colline Metallifere
Mt. Amiata
Trasimeno
Mt. Vettore
Corno Grande
Gran Sasso d'Italia
Mt. Terminillo
Mti Cimini
Mti Volsini
L. di Bolsena
L. di Vico
Mt. Argentario
I. Capraia
Can. di Piombino
I. d'Elba
I. di Pianosa
I. di Montecristo
I. del Giglio
I. di Giannutri
Arcipelago Toscano
Canale di Corsica
C. Corso
G. di S. Fiorenzo
Punta Revellata
Punta Scandola
Mt. Cinto
Mt. Rotondo
Mt. L'Incudine
G. di Ajaccio
Mt. di Cagna
Corsica
C. Pertusato
Bocche di Bonifacio
C. Testa
I. La Maddalena
I. di Caprera
I. Asinara
G. dell'Asinara
G. di Olbia
I. Tavolara
Mt. Limbara
Mti di Alà
C. Comino
Mt. Rasu
Logudoro
G. di Orosei
Sardegna
Gennargentu
C. di Mt. Santu
G. di Oristano
Mt. Linas
C. Pecora
I. di S. Pietro
I. di S. Antioco
I. Il Toro
C. Teulada
C. Spartivento
G. di Cagliari
C. Ferrato
I. Serpentara
C. Carbonara
Mar Tirreno
C. Linaro
L. di Bracciano
ROMA
Colli Albani
Mt. Circeo
Golfo di Gaeta
I. Palmarola
Isole Ponziane
I. di Ponza
I. di Ventotene
I. d'Ischia
I. di Procida
Arcipelago Campano
G. di Napoli
Capri
Vesuvio
Golfo di Salerno
Punta Campanella
Punta Licosa
C. Palinuro
G. di Policastro
P. d. Scalone
C. Bonifati
Mt. Pollino
Mt. Taburno
Mt. Vulture
Sella di Conza
APPENNINO MERIDIONALE
Le Murge
Penisola Salentina
Golfo di Taranto
C. S. Maria di Leuca
Canale d'Otranto
Tavoliere
Gargano
Testa del Gargano
Mt. Calvo
G. di Manfredonia
Isole Tremiti
I. di Pianosa
Isole di Pelagosa
L. di Lesina
L. di Varano
Mt. La Meta
I. Salta
I. Brazza
Can. di Lesina
I. Lesina
I. Lissa
Can. di Curzola
I. Curzola
Sabbioncello
I. Lagosta
I. Meleda
Bocche di Cattaro
Sila
Punta dell'Alice
C. delle Colonne
C. Rizzuto
Golfo di Squillace
Mt. Pecoraro
Punta Stilo
Aspromonte
Montalto
C. Spartivento
Mar Ionio
Isole Eolie (Lipari)
I. di Stromboli
G. di S. Eufemia
C. Vaticano
Golfo di Gioia
I. Salina
I. Filicudi
I. Alicudi
I. Lipari
I. Vulcano
C. Milazzo
G. di Patti
I. d'Ustica
Punta Raisi
G. di Castellammare
C. Gallo
G. di Palermo
G. di Termini I.
C. S. Vito
Isole Egadi
Levanzo
I. Marettimo
I. Favignana
C. Boeo (Lilibeo)
Val di Mazara
Rocca Busambra
Mti Nebrodi
Madonie
Mti Erei
Etna
Golfo di Catania
Piana di Catania
Mti Iblei
C. S. Croce
C. Murro di Porco
C. Passero
C. Isola d. Correnti
Stretto di Messina
Sicilia
Golfo di Gela
C. Scaramia
Canale di Sicilia
Canale di Malta
Gozo
Isole Maltesi
Malta
MEDITERRANEO
I. La Galite
C. Bianco
I. Zembra
C. Bon
Golfo di Tunisi
Monti della Medjerda
I. di Pantelleria
I. di Linosa
Isole Pelagie
I. Lampione
I. di Lampedusa

Table 8: marginal effects for each category

A stranger will return the lost wallet

	Not very likely or not likely at all	Fairly likely	Very likely
SNS use	0.176***	-0.131***	-.045**

A neighbour will return the lost wallet

	Not very likely or not likely at all	Fairly likely	Very likely
SNSs use	0.270***	0.053***	-0.323***

The police will return the lost wallet

	Not very likely or not likely at all	Fairly likely	Very likely
SNS use	0.268***	0.095***	-0.364***

* 'In the city or area where you live, imagine you lost your wallet holding money and your identification or address and it was found by someone else. How likely do you think your wallet would be returned to you if it were found by a stranger?'

Table 9. SNS use and social trust: IV estimates through CMP				
Stage	2nd stage (probit)		1st stage (probit)	
Dependent variable	Social trust		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-0.570	(-2.15)		
Type of connection to the Internet				
DSL	0.0506	(1.00)	0.314	(7.05)
Fibre	0.237	(2.24)	0.448	(4.47)
Satellite	0.144	(2.37)	0.312	(5.40)
3G	0.118	(1.26)	0.410	(4.69)
USB	0.0391	(0.76)	0.189	(3.76)
Mobile	0.101	(1.04)	0.497	(5.77)
Main demographic, social and economic characteristics				
Women	-0.0660	(-2.54)	-0.134	(-5.56)
Age	0.00899	(1.80)	-0.0439	(-31.31)
Single	0.170	(4.16)	0.288	(9.07)
Divorced	0.0750	(1.39)	0.266	(5.58)
Widowed	-0.0693	(-0.54)	0.256	(1.77)
Medium level of education	-0.0272	(-1.15)	0.0142	(0.59)
High level of education	0.473	(5.66)	-0.0720	(-0.83)
Children in the household	0.0185	(1.28)	-0.0448	(-3.40)
Other controls				
Wave 2010	0	.	0	.
Wave 2011	-0.0527	(-2.01)	0.107	(4.50)
Commuting (log minutes)	0.00949	(1.13)	0.00313	(0.36)
TV watching	-0.106	(-4.23)	0.0964	(4.33)
Real per capita GDP	0.0105	(4.34)	-0.00442	(-1.58)
Instruments				
DSL			0.0129**	(5.33)
Fibre			0.00442***	(2.00)
Observations	17048			
F_stat	28.78			
J_stat	389.7			
Chi2	3303.8			
* p < 0.1, ** p < 0.05, *** p < 0.001				

Table 10. SNS use and trust in strangers measured through the 'wallet question': IV estimates with CMP				
Stage	2nd stage (ordered probit)		1st stage (probit)	
Dependent variable	Trust in strangers		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-0.899***	(-9.38)		
Type of connection to the Internet				
DSL	0.136***	(3.67)	0.305***	(6.88)
Fibre	0.244**	(2.99)	0.429***	(4.36)
Satellite	0.162***	(3.35)	0.319***	(5.52)
3G	0.240***	(3.47)	0.371***	(4.21)
USB	0.0822**	(1.99)	0.188***	(3.75)
Mobile	0.184**	(2.46)	0.484***	(5.63)
Main demographic, social and economic characteristics				
Women	0.0105	(0.51)	-0.126***	(-5.28)
Age	-0.000290	(-0.14)	-0.0441***	(-31.49)
Single	0.171***	(5.99)	0.283***	(8.97)
Divorced	0.0157	(0.37)	0.254***	(5.34)
Widowed	-0.000421	(-0.00)	0.265*	(1.84)
Medium level of education	-0.00203	(-0.10)	0.0180	(0.76)
High level of education	0.234***	(3.87)	-0.0736	(-0.86)
Children in the household	0.00953	(0.85)	-0.0491***	(-3.76)
Other controls				
Wave 2010	0	(.)	0	(.)
Wave 2011	-0.0259	(-1.27)	0.109***	(4.60)
Commuting (log minutes)	-0.00637	(-0.87)	0.00240	(0.28)
TV watching	-0.107***	(-5.40)	0.0934***	(4.20)
Real GDP per capita	0.0165***	(8.54)	-0.00254	(-0.93)
Instruments				
DSL			0.0181***	(7.42)
Fibre			0.00715***	(3.53)
F_stat	55.09			
J_stat	1167.2			
Chi2	4051.6			
Observations	17048			
* p < 0.1, ** p < 0.05, *** p < 0.001				

Table 11. SNS use and trust in neighbours measured through the 'wallet question': IV estimates with CMP				
Stage	2nd stage (ordered probit)		1st stage (probit)	
Dependent variable	Trust in neighbours		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-0.814***	(-9.86)		
Type of connection to the Internet				
DSL	0.144***	(4.06)	0.308***	(7.01)
Fibre	0.314***	(3.61)	0.428***	(4.35)
Satellite	0.247***	(5.32)	0.312***	(5.43)
3G	0.181**	(2.56)	0.377***	(4.38)
USB	0.0693*	(1.73)	0.185***	(3.72)
Mobile	0.238***	(3.35)	0.475***	(5.48)
Main demographic, social and economic characteristics				
Women	0.00278	(0.14)	-0.129***	(-5.39)
Age	-0.00829***	(-4.79)	-0.0443***	(-31.66)
Single	0.0365	(1.25)	0.281***	(8.91)
Divorced	-0.0198	(-0.47)	0.252***	(5.26)
Widowed	0.00794	(0.07)	0.249*	(1.67)
Medium level of education	0.0283	(1.46)	0.0101	(0.42)
High level of education	0.158	(2.17)	-0.0782	(-0.90)
Children in the household	0.00911	(0.85)	-0.0473***	(-3.61)
Other controls				
Wave 2010	0	(.)	0	(.)
Wave 2011	-0.0360*	(-1.83)	0.104***	(4.38)
Commuting (log minutes)	-0.0190**	(-2.71)	0.000917	(0.11)
TV watching	-0.0423**	(-2.25)	0.0950***	(4.26)
Real GDP per capita	0.0236***	(12.79)	-0.00263	(-0.97)
Instruments				
DSL			0.00756***	(3.70)
Fibre			0.0192***	(7.77)
F_stat	60.55			
J_stat	900.0			
Chi2	3827.8			
Observations	17071			
* p < 0.1, ** p < 0.05, *** p < 0.001				

Table 12. SNS use and trust in the police measured through the 'wallet question': IV estimates with CMP				
Stage	2nd stage (ordered probit)		1st stage (probit)	
Dependent variable	Trust in the police		Use of SNS	
Indicator of online networking				
	β	se	β	se
Use of SNS	-0.975***	(-13.42)		
Type of connection to the Internet				
DSL	0.0806**	(2.26)	0.315***	(7.19)
Fibre	0.123	(1.39)	0.432***	(4.30)
Satellite	0.0751	(1.59)	0.315***	(5.51)
3G	0.231**	(3.14)	0.393***	(4.52)
USB	0.00638	(0.16)	0.189***	(3.82)
Mobile	0.143**	(2.06)	0.477***	(5.64)
Main demographic, social and economic characteristics				
Women	0.0147	(0.73)	-0.133***	(-5.58)
Age	-0.00471**	(-2.72)	-0.0442***	(-31.47)
Single	0.0479*	(1.65)	0.279***	(8.81)
Divorced	0.0231	(0.54)	0.252***	(5.24)
Widowed	0.208*	(1.88)	0.234	(1.64)
Medium level of education	0.0324	(1.64)	0.0150	(0.63)
High level of education	0.127	(1.61)	-0.0917	(-1.04)
Children in the household	-0.0146	(-1.33)	-0.0485***	(-3.69)
Other controls				
Wave 2010	1.76e-11	(.)	8.37e-19	(.)
Wave 2011	-0.000722	(-0.04)	0.0967***	(4.07)
Commuting (log minutes)	-0.0165**	(-2.36)	0.00277	(0.32)
TV watching	0.00281	(0.15)	0.0962***	(4.34)
Real GDP per capita	0.00821***	(4.50)	-0.000800	(-0.29)
Instruments				
DSL			0.0197***	(4.76)
Fibre			0.00970***	(8.29)
F_stat	68.82			
J_stat	656.7			
Chi2	4324.8			
Observations	17063			
* p < 0.1, ** p < 0.05, *** p < 0.001				