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Do cooperative enterprises create social trust? ¹

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Abstract

This paper contributes to the literature by carrying out the first empirical investigation into the role of different types of enterprises in the creation of social trust. Drawing on a unique dataset collected through the administration of a questionnaire to a representative sample of the population of the Italian Province of Trento in March 2011, we find that cooperatives are the only type of enterprise where the work environment fosters the social trust of workers.

Keywords: cooperative enterprises, nonprofit organizations, trust, social capital, motivations, inclusive governance, work organization.

JEL Codes: J24, J54, L33, Z1, Z13

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1. Introduction

Cooperative enterprises represent a limited, but growing phenomenon in contemporary economies. Since their origins they have been important actors in supporting the most disadvantaged social groups, in guaranteeing involvement and community development, and in complementing public welfare systems. Their socially oriented nature is mainly connected to their not-for-profit entrepreneurial action, to the democratic governance based on the “one member, one vote” rule, and to the concern for the community in which they are located, as established by the seventh International Co-operative Alliance (ICA) principle, introduced in the ICA gathering in Manchester in 1995 (Stickers, 2009). Most importantly, in recent years these businesses have strengthened resilience to the crisis in most economic systems, by increasing organizational diversity and providing proactive answers to worsening economic conditions. While competitive markets and the public sector are experiencing serious difficulties in most countries, cooperatives are showing more stability and reactivity (Stiglitz 2009). This is mostly because of their reduced reliance on support by financial markets resulting in less involvement in the financial crisis.

Some theoretical works have claimed that the socially oriented nature of cooperatives and their inclusive governance may have relevant effects in terms of social cohesion and growth’s sustainability (Dow, 2003; Stiglitz 2009; Birchall, 2010). Empirical testing of the social effects of cooperative firms is being developed in various directions. The impact of cooperatives on sustainable and stable employment has been analysed in seminal papers by Miyazaki and Neary (1983) and Ben-Ner and Jones (1995) whose claims have found support in various empirical studies (see for example Bonin et al., 1993; Craig and Pencavel, 1992, 1994; Burdin and Dean 2009). More recent works focus on the social impact of cooperatives in terms of income inequality, public health, employment protection (Ben-Ner et al. 2011; Erdal, 2012; Freundlich and Gago, 2012; Perotin, 2012). Yet, to the best of our knowledge, no result has been presented to date concerning the effects of cooperative firms on the creation and strengthening of social trust, and on the related accumulation of social capital.

This paper contributes to the literature by carrying out the first empirical investigation into the role of different types of enterprise in the creation of social trust. Our research question has important societal and economic implications because the creation and diffusion of trust is connected to the ability of the economy to function properly and to reproduce itself over time. As will be outlined in Section 2, the economics literature identifies trust as one of the pillars of economic development. Classical and neoclassical economists argued that the well-functioning of markets, the resilience of the economic system in times of crisis and, in the long run, the sustainability of growth and

development, rely on those institutions (whether formal or informal) that foster the sharing and diffusion of feelings of trust and norms of reciprocity (Smith 1759; Mill 1848; Arrow 1972). More recently, the social capital literature has provided evidence that trust supports growth and development through a number of channels such as, for example, the reduction of transaction costs and the enforcement of contracts (Putnam 1993; Knack and Keefer 1997; Guiso et al. 2008; 2009). A better understanding on how different entrepreneurial models affect the diffusion of trust would thus provide a crucial contribution to the literature and important insights for future research on the role organizational diversity.

Our empirical analysis relies on a unique dataset collected through the administration of a questionnaire to a representative sample of the population of the Italian Province of Trento in March 2011 (see Section 3 for further details). The dependent variable is given by responses to the question: “Thinking about the difference between the day you started your current work and today, how do you think that the work environment has influenced your trust towards others?”. Interviewees were requested to focus exclusively on *changes ascribable to the job they currently hold*.

After controlling for sample selection bias, we use ordered probit models to assess the determinants of work environment-driven changes in the social trust of workers. Our results show that cooperative enterprises can create social trust among workers, unlike any other type of enterprise.

More specifically, we find that the status of being employed in a cooperative enterprise increases the probability that work has improved the social trust of workers by 47.5% relative to employment in public enterprises, by 36.9% relative to private enterprises and by 51% relative to self-employment. This finding suggests that the development of cooperative enterprises – and, more generally, of less hierarchical models of governance and of not purely profit maximizing forms of enterprises – may play a crucial role in the diffusion of trust and in the accumulation of social capital. This may contribute to increased resilience of the economic system, especially in times of crisis.

The design of the questionnaire allows us to exclude the existence of reverse causality, since changes occurred in workers’ social trust during their current occupation cannot in any way influence their *past* choice to accept their *current* job. However, even if the way the trust question was posed is conceived to make interviewees focus exclusively on changes related to the environment and experience related to their current job, it may have been difficult for them to distinguish the effect of employment in cooperative enterprises from other individual or local characteristics or shocks that may have influenced the outcome variable. For example, intrinsically

motivated individuals may have a higher propensity to trust others and may be more willing to work in organizations characterised by participatory and democratic decision-making processes.

To deal with these issues, we include in the trust equation a wide set of individual and household control variables measuring respondents' values, beliefs, perceptions, and behaviours. In particular, we control for workers' intrinsic motivations as a predictor of the propensity to develop trust. In addition, in order to eliminate local-specific heterogeneity, we also run regressions with local fixed effects computed at the level of "local labour systems".

The outline of the paper is as follows. Section 2 presents the motivation of the study and briefly reviews the related literature. Section 3 describes our data and reports some descriptive statistics. The empirical analysis of the role of different types of enterprise in the creation of social trust is presented and discussed in section 4. Concluding remarks and a brief discussion of implications for future research close the paper.

2. Motivation of the study and related literature

Cooperatives have been described as membership based entrepreneurial organizations characterized by democratic and inclusive governance (Birchall, 2010; Borzaga and Tortia, 2010). The ownership of the organization, in terms of residual right of control and residual right of appropriation, is bestowed upon members, who have a personal character and are different from investors (Hansmann 1988, 1996). In other words, control over the organization and appropriation of its residual value rests with personal membership rights⁵ that, as a norm, is given in equal terms to all members (the so-called "One member, one vote" rule). Equality in membership rights implies, at a fundamental level, equal decision making power, and equal power in electing representatives in the board of directors. A clear difference can be shown, in this context, relative to investor-owned, for-profit companies. While the latter type of firm is well compatible with concentrated or even exclusive ownership (one single person or organization can own the whole capital of an investor owned business), the same is not true in cooperatives where, right from the start, a plurality of members share control rights in equal terms. Equality in membership rights also implies that the governance of the organization is built over an underlying horizontal structure in which decision making power is evenly distributed across members. Given this, cooperatives are expected to be

⁵ Cooperative enterprises can also be small organizations, as happens in producer and agricultural cooperatives. However, this evidence does not fundamentally modify the personal character of membership of cooperatives since, on the one hand, small producers and farmers very often coincide with individual or family firms (Valentinov, 2007). On the other hand, in legal terms, membership rights are given to organizations as legal persons and not to the capital invested in or by these legal persons.

less compatible than investor owned companies with hierarchal governance since this kind of governance would likely violate the egalitarian distribution of control rights.

The limited ability of cooperatives to pursue organizational and production efficiency by means of top-down, hierarchical decisions has been considered by new-institutional writers as one of their main flaws since this feature can lead to uncoordinated and lengthy decision making processes. In turn, inefficient organizational processes are expected to generate inflated ownership and governance costs (Hansmann, 1996). Yet, while they represent a minority organizational form, cooperatives are often observed in market economies and have been reported in some comparative studies to reach higher production efficiency than investor owned companies (Craig and Pencavel, 1992, 1994; Bartlett et al., 1992; Bonin et al., 1993; Burdin and Dean 2009; Burdin 2012). Where hierarchical governance does not represent the most effective solution for reaching production efficiency, cooperatives have been argued to favour inclusion more than hierarchy (Borzaga and Tortia, 2010). Participation in decision making and other organizational features related to inclusion, such as a high degree of procedural and distributive fairness, can support efficiency, though in markedly different ways relative to the case of hierarchy. Horizontal interpersonal and inter-organizational relations, more than vertical ones, are likely to emerge within cooperatives and to represent the basis of inclusive organizational routines (Erdal, 2011; Sacchetti and Tortia, 2012).

Horizontal relations and procedural fairness can also be related to the emergence of trust (Thibaut and Walker 1975; Lind and Tyler 1988; Putnam 1993; 2000). This may be due to two main reasons: on the positive side, procedural fairness better distributes burdens and rewards (both monetary and non-monetary) among the involved constituencies, thus creating an expectation of fair future rewards and representing, in this way, a crucial precondition for the spontaneous (or endogenous) emergence of trust. Some contributions find procedural fairness the most distinguishing organizational feature of cooperative firms (Tortia, 2008). Connectedly, on the negative side, the spread of fair decisions can discourage morally hazardous and other opportunistic behaviours or reinforce the social stigma against them. For example, peer pressure, which is the most typical feature of social relations in cooperating teams, has been described as a coordination mechanism that reduces shirking and free-riding, therefore increasing team members' trustworthiness (Mohnen et al., 2008; Mas and Moretti, 2009; Degli Antoni and Portale 2011). This can also favour or not discourage the endogenous emergence of trust⁶. Unfortunately, our data do not allow us to directly

⁶ It is worth noting that the spread of trust inside the organization can help to solve the new-institutionalist dilemma concerning the growth of transaction costs in terms of ownership and governance costs. In principle, horizontal, non-hierarchical decision making processes can be expected to be less coordinated and more time and resource expensive than hierarchical ones. However, this inefficient outcome may not be observed in reality. Trust relations, tacit knowledge and informal interpersonal relations can work as substitutes of hierarchy in supporting expedite and effective

test the relation between procedural fairness and the spread of trust in cooperatives *vis a vis* other organizational forms. However, we can test how different entrepreneurial forms – i.e. private, public, or cooperative enterprises - affect the diffusion of trust. A response to this question, which has never been empirically investigated before, may make a crucial contribution to the literature, in that trust represents one of the pillars of the well-functioning of markets and, in the long run, of growth and development processes.

Since the early 1990s, a growing number of studies have identified social capital – with particular regard to its “cognitive” dimension of social trust – as a factor of economic and social development. Trust has been argued to reduce transactions costs, favour the enforcement of contracts, facilitate credit at the level of individual investors, and to encourage innovation and investments in human and physical capital (see among others Putnam 1993; Fukuyama 1995; Knack and Keefer 1997; Zak and Knack 2011; Guiso et al. 2008; 2009).

As stated by Knack (2002): “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). Individuals in higher-trust societies indeed spend less on protecting themselves from being exploited in economic transactions (Knack and Keefer 1997).

Even if these views have gained credit in the economics debate only recently, it is worth noting that the concept of the social “embeddedness” of the economic action is deeply rooted in the history of economic thought, and can also be found in the early work of the classical economists. Typical code-words of the social capital literature (e.g. trust, norms, values, altruism, and sympathy) can be found in the work of Adam Smith. In the *Theory of Moral Sentiments*, Smith (1759) argued that there were certain virtues, such as trust and a concern for fairness, that were vital for the functioning of a market economy. He described trust and reciprocity as critical foundations of the early beginnings of the market, allowing reciprocal gift exchange to emerge, and leading to trade. John Stuart Mill shared the belief that trust plays a fundamental role in the economic performance of nations. In the *Principles of Political Economy* (1848), he stated:

“Conjoint action is possible just in proportion as human beings can rely on each other. There are countries in Europe where the most serious impediment to conducting business concerns on a large scale, is the rarity of persons who are supposed fit to be trusted with the receipt and expenditure of large sums of money”.

organizational outcomes; democratic governance can reduce, not inflate, transaction costs. Furthermore, for similar reasons, inclusive organizational relations are also expected to reduce agency costs, that is the costs associated with asymmetric information and contrasting objectives (Alchian and Demsetz, 1972; Jensen and Meckling, 1976).

These views were found again in influential works by Arrow (1972) and North (1990). In a famous paper, Arrow (1972) states 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). According to North (1990, p. 54) “the inability of societies to develop effective, low-cost enforcement of contracts is the most important source of both historical stagnation and contemporary underdevelopment in the Third World”.

In our view, it is reasonable to extend this point by arguing that not only the well-functioning of markets but also, to a larger extent, the resilience of the economic system, rely on those institutions (whether formal or informal) that foster the sharing and diffusion of feelings of trust and norms of reciprocity.

As we will better explain in the following sections, democratic and socially oriented organizations such as cooperatives may behave differently from any other type of enterprise in the way they affect workers’ values and beliefs. That is, their institutional structure may play a role in building trust inside and outside the organization. This kind of hypothesis has been already put forward, for example, by prominent authors in experimental law and economics. As Blair and Stout (2001, pp. 1735-1736) write:

“The experimental evidence indicates that decisions whether or not to trust others are in large part determined by social context rather than external payoffs. By altering social context-subjects’ perceptions of others’ beliefs, expectations, likely actions, and relationships to themselves-experimenters can reliably produce in subjects in social dilemmas everything from nearly universal trust to an almost complete absence of trust. In other words, most people behave as if they have two personalities or preference functions. One is competitive and self-regarding. The other is cooperative and other-regarding. Social framing is key in triggering when the cooperative personality emerges”.

In our study we concentrate on labour relations, which represent one specific dimension of governance⁷. Labour relations provide a privileged viewpoint as they allow an in-depth analysis of the impact of inclusive governance on the endogenous emergence of trust. They are deeply rooted and intertwined with the working of the governance structure and of the production process.⁸

⁷ We do this by concentrating on two main variables: the condition as worker employed by a cooperative firm, and the self-evaluated generation of trust towards other people due to working conditions. In so doing we correlate one objective dummy with one subjective rating. The correlation between objective and subjective variables is usually considered immune to spurious correlation due to common method bias, as evidenced by prominent methodological contributions (Podsakoff et al., 2003).

⁸ We consider labour relations in cooperative enterprises in general, without separating different types of cooperatives (worker, producer, consumer etc...). Hence our results refer to the general category of cooperative firms, and not to

Hence, we expect that the possible beneficial effects connected with worker involvement and equality of rights exert the maximum impact in their case.

3. Data and descriptive findings

As outlined in the Introduction, data were collected through the administration of a questionnaire to a representative sample ($n = 817$) of the Italian Province of Trento in March 2011⁹. The questionnaire was specifically designed for the assessment of the impact of cooperative enterprises on various dimensions of social capital. The sample was stratified by age, gender and area of residence. Our dependent variable is given by responses to the question “Thinking about the difference between the day you started your current work and today, how do you think that the work environment has influenced your trust toward others?” which was asked to all individuals with work experience, i.e. current workers (53% of the sample), retired workers (23%), and temporarily unemployed workers (1.8%). We thus focus on this sub-sample of people who are currently working or have worked in the past, which includes 629 individuals representing approximately 77% of the original sample¹⁰. As will be explained in Section 4, we control for sample selection bias in the empirical analysis. The distributions of frequencies across employees in cooperative enterprises, dependent workers, and the whole sample are reported in Table 1. It is worth noting that, in cooperative enterprises, *nobody* reports that the work environment has caused a decrease in social trust, unlike in the other categories of employment status¹¹. 72.9% of workers in cooperatives report a work-driven increase in social trust.

[Table 1 about here]

In order to provide more observations in each category and to the purpose of a more reliable interpretation of marginal effects, we collapse “very negatively” and “negatively” responses and

worker cooperatives alone. Unfortunately, we do not have at our disposition finer controls concerning employment in different types of cooperative.

⁹ The questionnaire was administered through computer assisted telephone interviews by the Technical Unit of the Department of Sociology and Social Research of the University of Trento. The administration of the questionnaire was funded by the European Research Institute on Cooperative and Social Enterprises (Euricse) located in Trento. Since, according to the research design, about 800-900 observations were required, a sample of 8855 units (i.e. about ten times the number of required observations) was extracted from census data. People included in the selected sample received a letter in advance announcing the possibility of a phone interview and briefly describing the aim and scope of the research. There were 1587 dropouts, 1777 people refused to be interviewed, 136 people missed the phone appointment, and 162 phone numbers were not in use at the time of the interview. 4396 numbers were not used.

¹⁰ Results do not change if we consider the smaller sample of current worker.

¹¹ Frequency distributions for public and private enterprises are not reported here for the sake of brevity. Tables are available upon request to the authors.

“positively and very positively” responses into two categories (1 = “the work environment negatively influenced social trust”, and 3 = “the work environment positively influenced social trust”, with 2 now meaning “not at all”). According to this new metric, workers’ responses are distributed as reported in Table 2 (for the sake of convenience, hereafter we will apply the label of “workers” to all individuals with work experience).

[Table 2 about here]

The main independent variable is employment status, which includes the condition of being employed as a dependent worker in private, public, cooperative or non-profit enterprises, self-employed (as entrepreneur, head of family business, or member of the arts and professions), unemployed with previous work experience, and retired with a work pension.

We are aware that there may be some degree of self selection of workers into a specific organizational type. Workers characterized by different attitudes, propensities, and preferences, are likely to choose different organizational forms in a way that better matches their personal characteristics. This implies that individuals with a higher propensity to trust others may be more willing to work in organizations characterised by democratic and participatory governance, such as cooperative enterprises. However, our dataset allows us to control for workers’ motivation in the choice of their current job, which can be considered as a proxy for individual preferences about aspirations, moral values and social norms of trust and reciprocity. More specifically, to deal with the self-selection problem, we control for the impact of intrinsic motivations. This control is relevant in the highly plausible hypothesis that intrinsically motivated individuals are also characterized by a stronger propensity to trust co-workers and other people. The hypothesis of a positive linkage between intrinsic motivations and the development of trust in the form of reciprocating behaviour was indeed confirmed by previous studies in experimental economics and psychology (Karagaretnam et al., 2009; Griesinger & Livingston, 1973; Liebrand, 1984; Frey and Jegen 2001; Degli Antoni 2009) and supported by contributions from law and economics (Blair and Stout, 2001; Marchegiani et al. 2011).

Individuals were asked to rate which aspects were important in the choice to undertake/accept their current job on a scale from 0 (not important at all) to 5 (very important), with the explicit recommendation to focus on their ex ante expectations about the job, not on the actual realization of such expectations¹². Nine items were proposed: 1. earnings and other economic incentives, 2. job

¹² This question was asked to all workers with job experience, i.e. current workers, retired workers and currently unemployed workers.

stability, 3. career perspectives, 4. flexibility in terms of work arrangements (e.g. the ability to choose one's own working hours), 5. the desire to find a good work environment in terms of relationships with colleagues and superiors, 6. the sharing of values and ideas, 7. the search for social recognition, 8. the opportunity to do an interesting, stimulating or creative job, 9. the desire to be useful to others or, more generally, to society.

We perform Categorical Principal Components Analysis (CatPCA) on the 9 items of motivation. We first perform the CatPCA considering a number of dimensions equal to the number of items (9). Two principal components are extracted with eigenvalue higher than 1. These two components are interpreted as representing intrinsic (component 1) and extrinsic (component 2) work motivations. Hence we perform again the CatPCA by including only two dimensions in the solution. The CatPCA allows us to convert the ordered Likert items into numerical variables, which are then used to perform Exploratory Factor Analysis (EFA)¹³. The EFA confirms the results obtained with the CatPCA since two factors are extracted. As goodness of fit statistics we consider the generalized Cronbach's Alpha index and the variance explained by the first two factors¹⁴. The first factor, which is highly correlated with the items measuring intrinsic motivation (items 5 through 9), explains in the rotated solution about 26% of the total variance in the data, while the second factor, which refers to the items of extrinsic motivation (items 1 through 4), explains 16% of the total variance. We then perform the reliability analysis on the two extracted groups of items by calculating the Cronbach's Alpha. This is done to account for construct validity. The Cronbach Alpha's for the intrinsic component is high, as it equals 0.81, and witnesses a high degree of internal consistency. The extrinsic component, on the other hand, shows a relatively low value Alpha (0.62). The low

¹³ We use the *Categorical Principal Component Analysis* (CatPCA; Meulman *et. al.*, 2004) for quantifying ordinal categories, with the number of the components $p = 2$, the number of the assumed subdimensions for the job motivations. The optimal quantifications are assigned to the categories of each item minimizing (by means of an alternating least squares algorithm) the following loss function simultaneously over \mathbf{O} and the \mathbf{Y}_j 's:

$$L(\mathbf{O}, \mathbf{Y}) = \sum_{j=1}^m \text{tr} \|\mathbf{O} - \mathbf{G}_j \mathbf{Y}_j\|^2$$

with $\text{tr}\|\cdot\|^2$ the trace operator of the squared norm of a matrix, \mathbf{G}_j the indicator matrix of item j , \mathbf{O} the $n \times p$ matrix of object scores for the n subjects, and \mathbf{Y}_j the matrix containing the category quantifications of item j . As goodness of fit statistics we consider the Generalized Cronbach's Alpha (GCA) index and the Variance Accounted For (VAF) index, that are normalized (in the interval [0;100]) indices based on the total eigenvalue of the CatPCA solution. The quantified variables obtained from the CatPCA are then used for the standard *Exploratory Factor Analysis* (EFA) to identify the hypothesized sub-dimensions by inspecting the factor loadings of the rotated solution.

¹⁴In the EFA, the extraction method is Principal Axis Factoring. This allows us to concentrate on the variance shared by the latent dimensions, not on total variance. This explains the relatively low percentage of total variance explained by the two factors with eigenvalue higher than one (about 42%). We also performed factor analysis by using Principal Components as extraction method. The results do not change qualitatively but the amount of variance explained by the first two factors is 55%. We extract the rotated solution using the Varimax method with Kaiser normalization, which is preferred to the Oblimin method because it allows the analysis of the two latent dimensions as independent (orthogonal) dimensions. This assumption eases the analysis though, in practice, we cannot exclude a non-zero correlation between intrinsic and extrinsic motivations.

amount of explained variance and of the Alpha leads us to interpret the extrinsic component as a residual one, in which all the non-intrinsic items are grouped. These items are perceived by workers as quite heterogeneous (as also testified by the low value of the communalities), though not to the point of constituting more than one latent construct (see the numerical output of CatPCA and of EFA in Appendix A). Finally, we extract factor scores for the two constructs, and use them in the econometric model.

We categorize the first factor (items 5 to 9) as intrinsic motivations, and the second factor as extrinsic motivations (items 1 to 4). It is worth noting that, in principle, the intrinsic motivations measured in our questionnaire can be further sub-divided into intrinsic self-regarding motivations, which refer to individual non-material utility (items 5, 7 and 8), and intrinsic other-regarding motivations, which reflect the concern for values and the utility of other people (items 6 and 9). As said, factor analysis allows the extraction of only one factor including both self and other-regarding intrinsic motivations. This result provides support for the hypothesis that different types of intrinsic motivations are complementary rather than substitute (Degli Antoni 2009; Becchetti et al., 2012).

It can be expected that organizations matching specific kinds of preference may have been able to develop specific incentive mixes that are particularly able to satisfy those preferences. For example, workers with low intrinsic motivations may be more likely to work in organizations that favour extrinsic or more materialistic motives. Hence, controlling for workers' preferences also entails indirect control of the features of the organization. As our results suggest, organizations that match the expectations of workers with high intrinsic motivations also appear better able to generate trust. Furthermore, as hypothesized, individuals characterised by intrinsic motivations are likely to have a stronger propensity to trust co-workers and other people. Hence, intrinsic motivations are introduced in the econometric model with the additional aim of further addressing possible self-selection phenomena. It is worth remembering that self-selection issues are also addressed through the particular way the trust question is asked, i.e. with the explicit request to focus on the specific impact of the work environment, which is not related to their pre-existing preferences and attitudes. We also control for the status of being a director of a cooperative enterprise. This is done to account for a possible role of directors of cooperatives in favouring (or halting) the generation of trust. These officers are elected by members on a "one member, one vote" basis, and are in charge of defining the main strategic objectives of the organization and of appointing the managers. Italian legislation does not require directors to be part of the membership. Indeed, they can be very different types of people, such as professionals, unpaid volunteers, or retired ex-members.

Other individual characteristics and behaviours that may influence both workers' attitude to developing social trust and the choice to undertake/accept a job are related to social capital. Social

trust is indeed considered as an important, “cognitive”, dimension of the broader concept of social capital. Following the seminal contribution by Uphoff (1999), the literature generally distinguishes between structural and cognitive dimensions of the concept (Kawachi and Kennedy 1997; Sabatini 2008; 2009; Degli Antoni and Sacconi 2009). Structural social capital deals with individuals’ behaviours and mainly takes the form of informal networks and associations which can be observed and measured through surveys. Cognitive social capital derives from individuals’ perceptions resulting in norms, values and beliefs that may contribute to the adoption of cooperative behaviours (Yamamura 2011; Antoci et al. 2012). These latter aspects involve subjective evaluations of the social and institutional environment in which the individual is embedded, which may affect the individual’s propensity to trust others. The complexity of social capital is further stressed by the existence of deep and changeable relations between its sub-dimensions. Social norms of trust and reciprocity prompt cooperative behaviours, in turn fostering the accumulation of durable ties (Carpenter et al. 2004; Fehr 2009).

In this paper, following a consolidated praxis in the social capital literature, we measure the structural dimensions of the concept as the informal and formal networks of relationships to which the worker belongs. For informal networks, we use measures of the frequency of meetings with relatives and with friends, as given by two ordinal variables obtained from responses to the questions: “How often do you see your relatives?” and “How often do you see your friends?”¹⁵. Participation in formal networks is measured through two binary variables coded as 1 if the interviewee is a member of at least one organization. Following the literature, we distinguish between “Olsonian” and “Putnam-esque” associations (see for example Knack and Keefer 1997; Yamamura 2012). We define as “Olsonian” those organizations which have redistributive goals and thus lobby for the protection of their members’ interests possibly against the interests of other groups (Olson 1965; 1982). Examples of this type of organization are professional and entrepreneurial associations, trade unions, and associations for the protection of consumers’ rights. We define as “Putnam-esque” those associations least likely to act as “distributional coalitions but which involve social interactions that can build trust and cooperative habits” (Knack and Keefer 1997, p. 1273). Examples of this type of organization are cultural circles, sport clubs, youth associations (e.g. scouts), and religious organizations.

An individual variable that may significantly influence the workers’ attitude to developing social trust within the work environment is the existence of friendships with colleagues. Friendships often

¹⁵ Possible responses to these questions were given on a scale from 1 = “I do not have relatives/friends” to 7 = “Every day”, with 2 = “Never”, 3 = “A few times per year”, 4 = “A few times per month”, 5 = “Once per week”, and 6 = “More than once per week”. As for meetings with relatives, interviewers were explicitly required to refer to non-cohabiting relatives.

start at the workplace, since work structures are a generator of face-to-face interactions that stimulate the sharing of social norms and the creation of interpersonal ties (Putnam 2000; Schur 2003; Antoci et al. 2011). Friendships with colleagues may favour the development of social trust as a consequence of on-the-job interactions. In order to control for this possibility, we include in our regressions an indicator of the frequency of meetings with colleagues, as measured by responses to the question: “How often do you see your colleagues outside of the workplace, in your leisure time?”, as given on the same 1-7 scale described in footnote 12.

For the cognitive dimension of social capital, we include in our regressions indicators of vertical trust and tolerance. Vertical trust is measured through the scores from 1 to 10 given by respondents to three questions concerning the extent to which the Parliament, the judicial system, and local politicians can be trusted, with 1 meaning “Not at all” and 10 meaning “Totally”¹⁶.

Tolerance was measured through the score given by respondents on a 5-point scale to the question: “Would you be willing to have non-EU immigrants as neighbours?”, with 1 meaning “Very unwilling” and 5 meaning “Very willing”. We chose to use immigrants as the benchmark for respondents’ level of tolerance because immigration and natives’ feelings of fear and intolerance towards non-EU immigrants have been one of the central issues of the political debate over the last twenty years, especially in the northern regions of Italy.

We also include the following demographic and socio-economic controls: gender, age, area of residence (urban vs. rural), education, and economic well-being. The indicator of economic well-being is given by responses to the question: “Is your household’s income sufficient to see you through to the end of the month?”. Fourteen per cent of interviewees answered “with great difficulty” or “with difficulty” and we define them as poor.

In addition, we account for some ecological variables measured at the level of Local Labour Systems. Italy’s Local Labour Systems (LLSs) are defined as self-contained labour markets with respect to daily commuting trips. The Italian territory is partitioned by the Italian National Institute of Statistics (ISTAT) into 686 local labour systems using the Population Census of 2001. The Province of Trento includes 17 LLSs.

In particular, we account for: 1. an indicator of the propensity for export by local firms, computed by ISTAT (2010). 2. the share of immigrants on the total population of the LLS. 3. The unemployment rate in the LLS, which may be a determinant of workers’ occupational choices. Table 3 reports descriptive statistics for the independent variables adopted in the analysis.

¹⁶ We accounted for local politicians instead of politicians in general, because the Province of Trento has autonomous jurisdiction relative to the Italian state on most social issues. Hence we consider the provincial rather than the national context as the relevant unit of political analysis.

[Table 3 about here]

4. Econometric findings

We model the variation in social trust caused by the work environment as an ordered probit model, after having tested the assumption of constancy of effects across categories assumed in this model. Since we can observe the effect of work in the creation of social trust only for the sample of workers, we estimate an ordered probit with sample selection using a two step procedure. First, we estimate a probit equation for the probability of working (or of having worked in the past, for retired or unemployed workers) and we derive the inverse Mills ratio (IMR). We then include IMR as a regressor in the ordered probit model. Since we find no evidence of selection bias, we report estimates without the correction factor¹⁷.

We define three dichotomous variables:

$$y_i^1 = \begin{cases} 1 & \text{if the work negatively influenced social trust} \\ 0 & \text{otherwise} \end{cases}$$

$$y_i^2 = \begin{cases} 1 & \text{if the work did not influence social trust} \\ 0 & \text{otherwise} \end{cases}$$

$$y_i^3 = \begin{cases} 1 & \text{if the work positively influenced social trust} \\ 0 & \text{otherwise} \end{cases}$$

and an index z_i for individual i by $z_i = \beta x_i + e_i$. The model can thus be written as

$$\begin{aligned} y_i^1 &= 1 & \text{if } y_i < c_1 \\ y_i^2 &= 1 & \text{if } c_1 < y_i < c_2 \\ y_i^3 &= 1 & \text{if } y_i > c_2 \end{aligned}$$

where c_1 and c_2 are the thresholds that the latent variable must cross to change the value of z . It follows that, assuming $e_i \in N(0,1)$:

$$\begin{aligned} \text{prob}(y_i^1 = 1) &= \Pr(e_i < c_1 - \beta' x_i) = \Phi(c_1 - \beta' x_i) \\ \text{prob}(y_i^2 = 1) &= \Pr(c_1 - \beta' x_i \leq e_i < c_2 - \beta' x_i) = \Phi(c_2 - \beta' x_i) - \Phi(c_1 - \beta' x_i) \\ \text{prob}(y_i^3 = 1) &= 1 - \text{prob}(y_i^1 = 1) - \text{prob}(y_i^2 = 1) = 1 - \Phi(c_2 - \beta' x_i) \end{aligned}$$

where $\Phi(\cdot)$ is the cumulative standard normal density.

Table 4 presents the results of the ordered probit estimates. To compare relative magnitudes of the effects of the independent variables, we report their marginal effects. In model 1 (column 1 of Table

¹⁷ As a further check we performed all the regression presented in Section 4 including IMRs among regressors. Their coefficient were always not statistically significant. Results of regressions are not presented in the paper for the sake of brevity and are available upon request to the authors.

4), we principally focus on employment status, social capital, and on a number of covariates representing individual socio-demographic and economic characteristics. In model 2 (column 2 of Table 4) we include motivations. Column 3 presents the estimates with fixed effects.

Among employment conditions, the status of being employed in a cooperative enterprise is the only significant predictor of the dependent variable. More specifically, workers in cooperative enterprises exhibit a 24 percentage point higher likelihood that work has driven an increase in their social trust from 52%. All of the other employment conditions – i.e. employment in a private or nonprofit enterprise, self-employment and temporary employment (*lavoro interinale*) are not statistically significant.

[Table 4 about here]

If we include motivations in the trust equation (column 2), we observe a slight increase in the significance and size of the effect of employment in cooperative enterprises, which is now equal to 25 percentage points from 52%. The effect remains striking, in that the status of being employed in a cooperative enterprise raises by 47.5% the probability that the current job has improved the social trust of workers in respect to the status of being employed in a public enterprise (which is the omitted category in the models presented in Table 4)¹⁸.

The replacement of the omitted category does not change the significance and size of the marginal effects and allows us to make further interesting comparisons. Marginal effects of employment statuses are compared in Table 5. Being employed in a cooperative enterprise increases the probability that work has improved the social trust of workers by 36.9% relative to employment in private enterprise and by 51% relative to self-employment. As we stated in the introductory sections, the institutional set-up and the features of the working environment may matter in favouring the emergence of trust. Our result seems to support the hypothesis that the inclusive and democratic features of governance in cooperatives may favour the emergence of trust due to their inherent participatory, horizontal, and fair nature.

Being a director of a cooperative enterprise raises the likelihood of developing work-driven social trust by 17 percentage points from 52%. This result may signal, again, the positive role of flat (horizontal) and egalitarian governance. Being elected by members with equal decision making power, elected directors find themselves relating to members in more a horizontal than hierarchical

¹⁸ Results do not show any significant change if we perform the regressions in the sub sample of current workers. The marginal effect of employment in cooperative enterprises on the work-driven development of trust is .24, the t-value being 2.95. Workers in cooperative enterprises exhibit a 24 percentage point higher likelihood that work has driven an increase in their social trust from 51%. The marginal effect of intrinsic motivations is equal to .16 (t-value is equal to 5.36). Full estimates are not presented here for the sake of brevity and are available upon request to the authors.

way. Horizontal interaction between directors and members can, again, favour the emergence of trust.

[Table 5 about here]

Workers who have been driven by intrinsic motivations in their choice of job exhibit a significant and 16 percentage point higher likelihood that the work experience has improved their social trust. Being driven by extrinsic motivations decreases the likelihood of developing social trust on the job by 3 percentage points. As explained in Section 3, the inclusion of motivations in the trust equations is intended to allow us to control for the self-selection of workers characterized by stronger propensity to trust. This result also confirms that intrinsic motivations are likely to represent one of the main preconditions for developing trust.

As expected, some dimensions of individuals' social capital are significantly and positively correlated with the dependent variable. Members in one or more Putnam-esque associations have a 16 percentage point higher probability of having increased their social trust as a consequence of their work experience. The habit of meeting friends and colleagues presents a positive but statistically weak correlation with the work-driven increase in social trust. This finding seems to support Putnam's (2000) view of those voluntary associations which do not have redistributive aims as "schools of democracy", from where cooperative values and trust may be "socialized". In the author's words, certain associations "instill in their members habits of cooperation, solidarity, and public-spiritedness" (Putnam 1993, pp. 89–90) which may also benefit non-members and, to a certain extent, society as a whole.

However, any generalization of this result should be handled with extreme caution, for at least two reasons. The ability of interpersonal interactions between members of organizations to create habits and attitudes towards serving the greater good is very likely to vary with culture and institutions. For example, religious organizations – which, in our empirical analysis, are classified among Putnam-esque organizations – may differ in prompting their members on the desirability to behave altruistically toward strangers (Knack and Keefer 1997; Knack 2002). Second, this result may suffer from endogeneity problems, as both membership in associations and the individual propensity of workers to develop social trust as a consequence of their interaction with the work environment may be influenced by omitted variables.

In order to eliminate local-specific heterogeneity which may simultaneously affect both workers' employment choices and work-driven changes in their level of trust, we also run regressions with local fixed effects computed at the level of local labour systems. Results are reported in column 3 of

Table 4. We do not record significant changes but a very slight decrease in the marginal effect of the role of employment in cooperative enterprises and of membership in Putnam-esque associations. The status of being employed in a cooperative enterprise now increases the probability that work has improved social trust by 44.1% in respect to employment in public enterprises, and by 34.4% in respect to employment in private enterprises. Workers in cooperative enterprises have a 51.3% higher likelihood to have developed social trust due to their work experience in respect to self-employed workers.

5. Conclusions

This paper contributes to the literature by presenting the first econometric investigation into the role of cooperative enterprises in the creation of social trust in a comparative perspective.

Our findings suggest that, unlike any other type of enterprise, cooperatives have a particular ability to foster the development of social trust. This result supports the view that the development of cooperative enterprises – and, more generally, of less hierarchical models of governance and of not purely profit maximizing forms of enterprises – may play a crucial role in the diffusion of trust and in the accumulation of social capital. Trust reduces uncertainty and transaction costs, enforces contracts, and facilitates credit at the level of individual investors, thereby enhancing the efficiency of exchanges and encouraging investment in ideas, human capital and physical capital. As argued by classical economists, trust is one of the pillars of the well-functioning of markets and, in the long run, of economic development. The resilience of the economic system also depends on its ability to foster, or at least to preserve, the diffusion of trust among individuals, specially in times of crisis. Our finding thus suggests that cooperatives may play an important role in strengthening the resilience to crisis in most economic systems.

Though we strived, through the logic of our arguments and through the effectiveness of empirical tests, to demonstrate the existence of a causal connection between the spread of cooperatives and the development of trust, we hasten to add that we have not been able to demonstrate causation in a definitive way (Wright, 1934; Pearl, 2012). The cross sectional design of the survey has prevented us from controlling for fixed effects at the individual level. In addition, we did not carry out fully randomized experiments, and we have not been able to single out suitable instrumental variables. Hence we cannot exclude the existence of some form of endogeneity leading to inconsistent estimates. Omitted variables and self-selection are the most likely candidates for such inconsistency. Despite these limitations, however, our work also shows important strengths in that it is the first study in which trust and the accumulation of social capital have been firmly anchored to

the features of labour relations and to one specific organizational form, the cooperative enterprise, which is characterized by inclusive and horizontal governance.

Tables

Table 1. How do you think that the work environment has influenced your trust towards others?

| | Full sub-sample (past and present workers) | | Present workers | | Past and present employees | | Present employees | | Past and present coop enterprise workers | | Current coop enterprise workers | |
|-----------------|--|------------|-----------------|------------|-------------------------------|------------|----------------------|------------|--|------------|---------------------------------------|------------|
| | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| Very negatively | 23 | 3.66 | 17 | 3.99 | 19 | 3.48 | 14 | 4.03 | 0 | 0 | 0 | 0 |
| Negatively | 44 | 7.01 | 30 | 7.04 | 37 | 6.78 | 23 | 6.63 | 0 | 0 | 0 | 0 |
| No effect | 226 | 35.99 | 160 | 37.56 | 198 | 36.26 | 133 | 38.33 | 13 | 27.8 | 12 | 30 |
| Positively | 222 | 35.35 | 151 | 35.45 | 188 | 34.43 | 118 | 34.01 | 20 | 41.67 | 16 | 40 |
| Very positively | 101 | 16.8 | 65 | 15.26 | 93 | 17.03 | 57 | 16.43 | 15 | 31.25 | 12 | 30 |
| Does not know | 12 | 1.91 | 3 | 0.70 | 11 | 2.01 | 2 | 0.58 | 0 | 0 | 0 | 0 |
| <i>Tot</i> | <i>628</i> | <i>100</i> | <i>426</i> | <i>100</i> | <i>546</i> | <i>100</i> | <i>347</i> | <i>100</i> | <i>48</i> | <i>100</i> | <i>40</i> | <i>100</i> |

Table 2. How do you think that the work environment has influenced your trust towards others?

| | Full sub-sample (past and present workers) | | Present workers | | Past and present employees | | Present employees | | Past and present coop enterprise workers | | Current coop enterprise workers | |
|------------|--|------------|-----------------|------------|-------------------------------|------------|----------------------|------------|--|------------|---------------------------------------|------------|
| | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| Negatively | 67 | 10.88 | 47 | 11.11 | 56 | 10.47 | 37 | 10.72 | 0 | 0 | 0 | 0 |
| No effect | 226 | 36.69 | 160 | 37.83 | 198 | 37.01 | 133 | 38.55 | 13 | 27.08 | 12 | 30 |
| Positively | 323 | 52.44 | 216 | 51.06 | 281 | 52.52 | 175 | 50.72 | 35 | 72.92 | 28 | 70 |
| <i>Tot</i> | <i>616</i> | <i>100</i> | <i>423</i> | <i>100</i> | <i>535</i> | <i>100</i> | <i>345</i> | <i>100</i> | <i>48</i> | <i>100</i> | <i>40</i> | <i>100</i> |

Note: missing observations (i.e. "does not know" replies) are not accounted for in the table

Table 3. Descriptive statistics of independent variables

| Variables | Obs | Mean | St. dev. | Min | Max |
|---|-----|-----------|----------|-------|-------|
| Employed in private enterprises | 814 | .32 | .47 | 0 | 1 |
| Employed in public enterprises | 814 | .28 | .45 | 0 | 1 |
| Employed in cooperative enterprises | 814 | .06 | .24 | 0 | 1 |
| Employed in nonprofit enterprises | 814 | .01 | .10 | 0 | 1 |
| Self-employed | 817 | .09 | .29 | 0 | 1 |
| Temporary employee (<i>interinale, parasubordinato</i>) | 817 | .01 | .10 | 0 | 1 |
| Unemployed worker | 817 | .02 | .13 | 0 | 1 |
| Retired worker | 817 | .23 | .42 | 0 | 1 |
| Director in a coop enterprise | 817 | .05 | .22 | 0 | 1 |
| <i>Motivations</i> | | | | | |
| Intrinsic motivations | 564 | 6.75e-10 | .89 | -3.18 | 1.28 |
| Extrinsic motivations | 564 | -1.50e-09 | .81 | -2.95 | .97 |
| <i>Social capital</i> | | | | | |
| Meetings with relatives | 816 | 6.14 | 1.26 | 1 | 7 |
| Meetings with friends | 814 | 5.61 | 1.23 | 1 | 7 |
| Meetings with colleagues | 734 | 3.40 | 1.79 | 1 | 7 |
| Membership in Putnam-esque associations | 817 | .15 | .36 | 0 | 1 |
| Membership in Olsonian associations | 817 | .14 | .35 | 0 | 1 |
| Trust in the judicial system | 817 | 5.83 | 2.38 | 1 | 10 |
| Trust in the Parliament | 817 | 4.12 | 2.21 | 1 | 10 |
| Trust in local politicians | 817 | 5.30 | 2.30 | 1 | 10 |
| Tolerance | 817 | 2.94 | 1.19 | 1 | 5 |
| <i>Socio-demographic characteristics</i> | | | | | |
| Gender (female) | 817 | .52 | .50 | 0 | 1 |
| Age (put categories here) | 817 | 2.47 | 1.09 | 1 | 4 |
| Area of residence (urban vs. rural) | 817 | .36 | .48 | 0 | 1 |
| Low education | 813 | .43 | .49 | 0 | 1 |
| Mean education | 813 | .41 | .49 | 0 | 1 |
| High education | 813 | .16 | .37 | 0 | 1 |
| Poor | 817 | .15 | .37 | 0 | 1 |
| <i>Ecological controls</i> | | | | | |
| LLS propensity for export | 817 | 46.24 | 13.88 | .37 | 65.68 |
| LLS immigrants share of the population | 817 | .03 | .01 | .02 | .04 |
| LLS unemployment rate | 817 | 4.28 | .76 | 3.32 | 7.69 |

| | Model 1 | | Model 2 | | Model 3 | |
|---|-----------------|---------|-----------------|---------|------------------|---------|
| | Marginal effect | t stat. | Marginal effect | t stat. | Marginal effect. | t stat. |
| <i>Employment status</i> | | | | | | |
| Employed in private enterprises | .07 | 1.31 | .07 | 1.40 | .06 | 0.75 |
| Employed in cooperative enterprises | .24 | 3.23 | .25 | 3.47 | .23 | 2.73 |
| Nonprofit enterprises | -.08 | -0.56 | -.08 | -0.56 | -.08 | -0.31 |
| Self-employed | .01 | -0.15 | .02 | -0.27 | .05 | -0.40 |
| Temporary employee (<i>interinale, parasubordinato</i>) | .05 | -0.42 | .07 | -0.61 | .03 | -0.26 |
| Unemployed worker | .08 | -0.75 | .09 | -0.87 | -.06 | -0.41 |
| Retired worker | -.08 | -0.90 | -.09 | -1.10 | -.10 | -1.48 |
| Director in a coop enterprise | .17 | 1.93 | .17 | 1.98 | .15 | 1.32 |
| <i>Motivations</i> | | | | | | |
| Intrinsic motivations | | | .16 | 6.42 | .14 | 4.49 |
| Extrinsic motivations | | | -.05 | -1.78 | -.03 | -2.81 |
| <i>Social capital</i> | | | | | | |
| Meetings with relatives | .00 | 0.27 | .01 | 0.35 | .01 | 0.49 |
| Meetings with friends | .04 | 1.79 | .04 | 2.32 | .04 | 2.67 |
| Meetings with colleagues | .03 | 1.76 | .02 | 1.58 | .02 | 1.40 |
| Membership in Putnam-esque associations | .15 | 2.53 | .16 | 2.65 | .14 | 2.73 |
| Membership in Olsonian associations | .03 | 0.52 | .03 | 0.45 | .04 | 0.60 |
| Trust in the judicial system | -.01 | -0.56 | -.01 | -0.78 | .01 | -0.72 |
| Trust in the Parliament | .00 | 0.48 | .01 | 0.56 | .01 | 1.43 |
| Trust in local politicians | .01 | 0.77 | .01 | 0.85 | .00 | 0.79 |
| Tolerance | -.01 | -0.34 | -.01 | -0.44 | .00 | -0.11 |
| <i>Demographic, social and economic characteristics</i> | | | | | | |
| Gender (female) | .00 | 0.09 | .01 | 0.18 | .01 | 0.95 |
| Age | .06 | 1.64 | .07 | 1.94 | .07 | 1.23 |
| Area of residence (urban vs. rural) | .08 | 1.62 | .08 | 1.62 | .06 | 6.17 |
| Low education | .08 | 1.22 | .09 | 1.30 | .10 | 1.70 |
| Mean education | .04 | 0.64 | .03 | 0.50 | .05 | 0.62 |
| Poor | .00 | 0.00 | -.01 | -0.19 | .03 | -0.54 |
| <i>Ecological variables</i> | | | | | | |
| LLS propensity for export | -.00 | -0.29 | -.00 | -0.20 | | |
| LLS immigrants share of the population | 2.58 | 0.57 | 2.23 | 0.48 | | |
| LLS unemployment rate | .02 | 0.83 | .02 | 0.82 | | |
| Observations | 530 | | 527 | | 525 | |
| Pseudo R2 | 0.09 | | 0.09 | | 0.103 | |
| Wald chi ² | 108.40 | | 113.95 | | 243.93 | |
| Prob > chi ² | 0.00 | | 0.00 | | 0.00 | |
| Omitted categories: employment in a public enterprise self-regarding motivations High education | | | | | | |

| | | Employment in public enterprises | | Employment in private enterprises | | Self-employment | |
|---|-----------------------------|----------------------------------|---------------|-----------------------------------|---------------|-----------------|---------------|
| | | Model 2 | Model 3 | Model 2 | Model 3 | Model 2 | Model 3 |
| Effect of employment in coop enterprises on social trust of workers | Comparative effect | +47.5% | + 44.1% | + 36.9% | + 34.4% | + 44.1% | + 51.3% |
| | Marginal effect and t-value | .25 (3.47) | .23 (2.73) | .19 (2.49) | .18 (2.87) | .23 (2.73) | .27 (3.05) |

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Appendix A - Categorical Principal Components Analysis and Factor Analysis

Categorical principal components analysis

Model Summary

| Dimension | Cronbach's Alpha | Variance Accounted For |
|-----------|-------------------|------------------------|
| | | Total (Eigenvalue) |
| 1 | .789 | 3.350 |
| 2 | .357 | 1.464 |
| Total | .891 ^a | 4.814 |

- a. Total Cronbach's Alpha is based on the total Eigenvalue.

Correlations Transformed Variables

| | V3410_1 | V3410_2 | V3410_3 | V3410_4 | V3410_5 | V3410_6 | V3410_7 | V3410_8 | V3410_9 |
|----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| V3410_1 ^a | 1.000 | .320 | .340 | .252 | .198 | .090 | .247 | .045 | .049 |
| V3410_2 ^a | .320 | 1.000 | .258 | .209 | .216 | .080 | .209 | .047 | .158 |
| V3410_3 ^a | .340 | .258 | 1.000 | .280 | .259 | .171 | .248 | .254 | .153 |
| V3410_4 ^a | .252 | .209 | .280 | 1.000 | .322 | .284 | .314 | .288 | .222 |
| V3410_5 ^a | .198 | .216 | .259 | .322 | 1.000 | .440 | .395 | .445 | .386 |
| V3410_6 ^a | .090 | .080 | .171 | .284 | .440 | 1.000 | .426 | .444 | .512 |
| V3410_7 ^a | .247 | .209 | .248 | .314 | .395 | .426 | 1.000 | .381 | .405 |
| V3410_8 ^a | .045 | .047 | .254 | .288 | .445 | .444 | .381 | 1.000 | .458 |
| V3410_9 ^a | .049 | .158 | .153 | .222 | .386 | .512 | .405 | .458 | 1.000 |
| Dimension | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Eigenvalue | 3.264 | 1.432 | .804 | .715 | .680 | .601 | .553 | .509 | .441 |

- a. Missing values were imputed with the mode of the quantified variable

| Component Loadings | | |
|-----------------------------------|-----------|-------|
| | Dimension | |
| | 1 | 2 |
| V3410_1 | .389 | .688 |
| V3410_2 | .382 | .564 |
| V3410_3 | .526 | .456 |
| V3410_4 | .592 | .209 |
| V3410_5 | .725 | -.093 |
| V3410_6 | .707 | -.376 |
| V3410_7 | .705 | -.028 |
| V3410_8 | .675 | -.356 |
| V3410_9 | .669 | -.379 |
| Variable Principal Normalization. | | |

Factor analysis

| Communalities | | |
|--|---------|------------|
| | Initial | Extraction |
| V3410_1 Quantification | .243 | .446 |
| V3410_2 Quantification | .203 | .271 |
| V3410_3 Quantification | .262 | .355 |
| V3410_4 Quantification | .231 | .284 |
| V3410_5 Quantification | .402 | .470 |
| V3410_6 Quantification | .434 | .552 |
| V3410_7 Quantification | .337 | .400 |
| V3410_8 Quantification | .409 | .498 |
| V3410_9 Quantification | .415 | .496 |
| Extraction Method: Principal Axis Factoring. | | |

| Total Variance Explained | | | | | | | | | |
|--|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Factor | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| | 1 | 3.453 | 38.371 | 38.371 | 2.897 | 32.184 | 32.184 | 2.368 | 26.310 |
| 2 | 1.461 | 16.230 | 54.601 | .874 | 9.715 | 41.899 | 1.403 | 15.589 | 41.899 |
| 3 | .762 | 8.461 | 63.063 | | | | | | |
| 4 | .703 | 7.816 | 70.879 | | | | | | |
| 5 | .661 | 7.340 | 78.219 | | | | | | |
| 6 | .568 | 6.315 | 84.534 | | | | | | |
| 7 | .538 | 5.982 | 90.515 | | | | | | |
| 8 | .472 | 5.250 | 95.765 | | | | | | |
| 9 | .381 | 4.235 | 100.000 | | | | | | |
| Extraction Method: Principal Axis Factoring. | | | | | | | | | |

| Rotated Factor Matrix^a | | |
|---|--------|------|
| | Factor | |
| | 1 | 2 |
| V3410_1 Quantification | | .668 |
| V3410_2 Quantification | | .513 |
| V3410_3 Quantification | | .551 |
| V3410_4 Quantification | .360 | .393 |
| V3410_5 Quantification | .607 | .318 |
| V3410_6 Quantification | .738 | |
| V3410_7 Quantification | .537 | .334 |
| V3410_8 Quantification | .698 | |
| V3410_9 Quantification | .700 | |
| Extraction Method: Principal Axis Factoring. | | |
| Rotation Method: Varimax with Kaiser Normalization. | | |
| a. Rotation converged in 3 iterations. | | |