

THE DETERMINANTS OF OUTREACH PERFORMANCE OF SOCIAL BUSINESS: AN INQUIRY ON ITALIAN SOCIAL COOPERATIVES

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ABSTRACT: *We analyze factors affecting outreach performance of a large sample of (type A) social cooperatives in Italy taking into account their heterogeneity with a multi-output stochastic distance function frontier. We find that cooperative age, innovation leading to new products / customer segments, managerial turnover, target programming and shareholder variety are positively and significantly (while shareholder meetings, the number of volunteers and of contracts negatively and significantly) correlated with outreach performance, measured as the capacity of serving more beneficiaries given labour and capital inputs. Outreach is also significantly and positively affected by local GDP and human capital.*

Keywords: social cooperatives, outreach, multi-output stochastic distance function frontier

JEL classification: L31, L25

Die Determinanten der Outreach-Performance von Social Business: Eine Untersuchung italienischer Sozialgenossenschaften

Wir analysieren Faktoren, die die Performance von Sozialgenossenschaften in Italien im Hinblick auf die Bereitstellung von Dienstleistungen für Bevölkerungsgruppen beeinflussen, die sonst keinen Zugang zu diesen hätten (outreach). Wir stützen uns dabei auf eine große Stichprobe von (Typ A) Sozialgenossenschaften, wobei wir die Heterogenität mittels eines multi-output stochastic distance function frontier-Ansatzes berücksichtigen. Wir stellen fest, dass das Alter der Genossenschaft, die Innovation, die zu neuen Produkt-/Kundensegmenten führt, die Zielfestlegung, und die Vielfalt der Anteilseigner positiv und signifikant korrelieren mit der Outreach-Performance, gemessen als die Kapazität, mehr Nutznießern bei gegebenen Arbeits- und Kapitalinputs zu dienen (während Anteilseigner-Versammlungen sowie die Zahl der Ehrenamtlichen und der Kontrakte negativ und signifikant korrelieren). Auch das lokale BIP und Humankapital beeinflussen die Outreach-Performance signifikant und positiv.

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Los factores determinantes del éxito en la sensibilización del trabajo social: una encuesta sobre las cooperativas sociales italianas

Los autores analizan los factores que afectan a las actividades de sensibilización en una amplia muestra de cooperativas sociales tipo A en Italia, tomando en consideración su heterogeneidad, para lo que utilizan una función de frontera estocástica multioutput. Los autores encuentran que la edad de la cooperativa, la innovación conduciendo en nuevos segmentos de productos/clientes, la rotación de los dirigentes, la programación dirigida y la variedad de accionistas están positivas y significativamente correlacionadas con el resultado de la sensibilización, medida como la capacidad de servir a más beneficiarios para inputs iguales de capital y de trabajo. La sensibilización está también significativa y positivamente afectada por el PIB local y por el capital humano.

Les facteurs déterminants de la performance de sensibilisation du travail social : une enquête auprès des coopératives sociales italiennes

Les auteurs analysent les facteurs affectant la performance de sensibilisation d'un large échantillon de coopératives sociales (type A) en Italie en tenant compte de leur hétérogénéité en utilisant une fonction de frontière stochastique de distance multi-output. Les auteurs trouvent que l'âge de la coopérative, l'innovation menant à de nouveaux segments de produits/clientes, la rotation des dirigeants, la programmation ciblée et la variété de l'actionnariat sont positivement et significativement corrélés à la performance de sensibilisation (mesurée par la capacité de servir plus de bénéficiaires pour un même input en capital et en travail). Les réunions des actionnaires, le nombre de bénévoles et d'employés sous contrat sont par contre négativement et significativement corrélés. La sensibilisation est aussi significativement et positivement affectée par le PIB local et le capital humain.

1 Introduction¹

Under the system which separates employers and the employed high wages are not found to be the only boon which the receivers could wish; for it is sometimes found that the best-paid workmen are the most unwise and intemperate. For the most ignorant and unskilled of the workmen in the lowest strata the object would seem to be to give not merely more wages, but give more in such a way as might excite new and better motives, a desire as well as a possibility of improvement. Self-help must be stimulated, not deadened by stifling dependence on a class of superiors, or on the state. The extraordinary growth of co-operation is one of the most cheering signs of modern times.

John Stuart Mill, *Principles of Political Economy* (chapter 5, p. 606)

1 The data used in this research are provided by ISTAT and are drawn from a survey on the 'Italian Social Cooperatives' in 2005. Estimations are performed at 'Laboratorio per l'Analisi dei Dati ELEMENTARI', Istat, in compliance with the rules on privacy and data disclosure. Results and opinions expressed in this paper are solely those of the authors and are not official statistics. Estimations are performed without using sample weights.

Social cooperatives are playing an increasingly relevant role in economies of high income countries which strive to maintain their past welfare achievements and happen to face shrinking budget constraints (Pesenti 2014, Brugnoli and Colombo 2012). Their importance has been recently acknowledged by the EU commission which has recently launched the ‘Social Business Initiative’,² a framework for action which aims to contribute to the creation of a favourable environment for the development of social business in Europe. The EU motivated its action on the Social Business Initiative by saying that ‘Social enterprises seek to serve the community’s interest (social, societal, environmental objectives) rather than profit maximization. They often have an innovative nature, through the goods or services they offer, and through the organization or production methods they resort to. They often employ society’s most fragile members (socially excluded persons). They thus contribute to social cohesion, employment and the reduction of inequalities.’ According to a recent study quoted by the same Social Business Initiative the growing relevance of social enterprises is documented by the fact that one company out of four founded in the EU (one out of three in Finland, France and Belgium) is social business.³

The recent development and growth of social business and cooperatives is an apparently surprising phenomenon for standard economic theory. The old vintage neo-classical theory justified the existence of non profit maximizing and multistakeholder cooperative firms on the basis of a temporary need to address market failures due to transitory limits of market competition and institutional intervention (see, among others, Ward 1958 and Furubotn and Pejovich 1970). Contrary to this prediction cooperative firms persisted and continued to grow leading theorists to revise their theoretical beliefs. According to the broader ‘neoinstitutionalist’ perspective (Hansmann 1996), productive organizations which are more fit to survive are those which minimize transaction costs of all (controlling and non-controlling) stakeholders. In this perspective cooperatives may have a competitive advantage vis-à-vis profit maximizing firms in minimizing transaction costs of non controlling stakeholders. A final and more recent strand of thought finds that cooperative firms have a comparative advantage in satisfying non self-regarding needs of human beings such as those of participation, reciprocity, inequity aversion and solidarity, whose empirical relevance and impact on life satisfaction has been largely documented in the recent literature (Borzaga and Defourny 2001, Becchetti and Borzaga 2009).⁴ In this sense, even under the extreme hypothetical case of perfect market competition and perfect institutions, there would still be room for the existence of cooperatives and not for profit organizations since individuals feel the need of satisfying their other-regarding preferences and intrinsic motivations⁵ by providing public goods and services directly, without delegating them to governmental entities.

2 http://ec.europa.eu/internal_market/social_business/index_en.htm.

3 Global Entrepreneurship Monitor Report on Social Entrepreneurship (Lepoutre et al. 2011).

4 For a survey on non self-regarding preferences in behavioural economics see, among others, Fehr and Schmidt (2001). For a survey on the determinants of life satisfaction including those related to participation and other-regarding behaviour see Frei and Stutzer (2002) and Becchetti and Pelloni (2013).

5 According to Deci (1975) ‘one is said to be intrinsically motivated to perform an activity when he receives no apparent reward except the activity itself’. More extensively Deci and Ryan (2000) consider that: ‘Perhaps no single phenomenon reflects the positive potential of human nature as much as intrinsic motivation, the inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities, to explore, and to learn. . . . The construct of intrinsic

Beyond these general and always valid considerations the slowdown of economic activity and the increasing constraint on government budgets in most high income countries after the global financial crisis determined in the last decade⁶ a progressive decline of the welfare state and posed serious threats on the capacity of satisfying wellbeing demands of citizens. Also due to this state of necessity, governments increasingly ended up delegating the provision of social goods and services to local not for profit enterprises. This delegation found further motivation in the subsidiarity principle: if there exists a local group of intrinsically motivated people who can perform the task they will be highly likely to do the job better and with lower costs than a distant and bureaucratic government structure (Pesenti 2014, Brugnoli and Colombo 2012).⁷

The above mentioned theoretical and historical background motivates the research on the category of social business represented by Italian social cooperatives. Social cooperatives are a new and more recent form of cooperative organization created by the Italian law 381/1991 with a multistakeholder governance and social goals such as work integration of disadvantaged categories and/or wellbeing of the community and human being promotion (for a detailed description of social cooperatives see section 2). Data from the Italian National Institute of Statistics (ISTAT 2008) document that at end 2005 there were 244,223 employees (and 34,626 volunteers) in Italy working in social cooperatives which produced €6.4 billion of goods and services for more than 3,300,000 beneficiaries. The increasingly tight budget constraints led to a further rise of the social cooperative role with more than 70% social enterprises born after 1991 and a growth of enterprises by 19.5%, of workers by 26.2%, and of the value of the goods and services provided by 32.2% (in constant 2005 terms) (Becchetti and Castriota 2012). The last Italian census

motivation describes this natural inclination toward assimilation, mastery, spontaneous interest, and exploration that is so essential to cognitive and social development and that represents a principal source of enjoyment and vitality throughout life’.

Based on this statement a partition which is usually made between self-regarding (mainly those mentioned in the Deci and Ryan (2000) statement) and other-regarding intrinsic motivations (higher effort in case of consistence between individual and organizational ethos and/or mission). A relevant finding of the literature is that in the complex interplay between extrinsic and intrinsic motivations monetary incentives may crowd out the latter (See among others Kreps 1997 and Frey and Oberholzer-Gee 1997) thereby producing paradoxical effects on productivity (for an extensive survey on the crowding out literature see Frey and Jegen 2001). As well from a static point of view higher intrinsic motivations may be compensated by lower wages under the traditional compensating differentials hypothesis. From a dynamic point of view however more intrinsically motivated workers may put more effort in their jobs thereby contributing positively to organization efficiency (Becchetti et al. 2012).

6 In a recent working paper Laeven and Valencia (2012) calculate that the cost of the global financial crisis ranges from around 20 points in the public debt/GDP ratio of Greece, Belgium, Germany and the UK up to more than 70 points in Ireland and Iceland.

7 A recent empirical analysis seems to indicate that the subsidiarity principle works for Italian social cooperatives which are object of our scrutiny. By comparing average costs of services in different areas it finds that subsidized student housing costs on average 9,093 against 10,943 euros per year when provided by social cooperatives versus public sector entities. Similar differences are found in nurseries (7,717 against 13,087 euros), health care structures (99 against 125 euros per day), rehabilitation centers (131 against 168 euros per day) and social housing (327 against 606 per year). The same research demonstrates that customer satisfaction is higher with social cooperatives than with public providers in all the above described sectors of activity (Rapporto sulla sussidiarietà 2014).

data documents in 2011 a further sharp increase of non profit organizations with 301.191 units (28 percent increase with respect to 2001), 4.7 million volunteers (43 percent more than in 2011), 681,000 full time workers and 276,000 temporary workers.

The growing role played by social cooperatives in the provision of public goods and services, together with the increasing budget constraints which force governments to delegate to them the welfare provision with progressively lower budgets (Barbetta 1997), create on them a formidable pressure on efficiency. In order to cope with beneficiaries' expectations with lower resources social cooperatives are called to improve their efficiency if they want to survive and satisfy the needs of their customers. For all these reasons measuring the efficiency of the organizations to which provision of welfare has been delegated (the goal of our paper) and identifying its main determinants is a very relevant, though almost unexplored issue.

Measuring determinants of social business performance is however a hard task. As is well known, if efficiency analysis has methodological fallacies when it comes to profit maximizing firms, this is all the more so for social enterprises since many of the latter are involved in social care, a sector of activity where product quality is intangible, consumption and production occur simultaneously so that the quality depends on the relationship created on both sides by the 'producer' and the 'consumer' (Malley and Fernandez 2010). The problem of social enterprises is therefore that they work in special segments (health, education, assistance) where the distance from the frontier does not necessary measure 'suboptimal' use of available resources and care for the beneficiaries is a fundamental factor affecting quality of provided services. Since care requires time, a quality/quantity trade off may easily arise. These peculiar characteristics make it difficult to adopt standard parametric/non parametric approaches where (in)efficiency is conventionally measured on the production side as distance from the frontier of physical or monetary value of the production (with the frontier being the maximum estimated production possibility given the quantity of inputs available in the firms) (Aigner et al. 1977, Meeusen and van den Broeck 1977).

Based on this literature and on the above described methodological problems the contribution of this paper is multifold. First, the paper represents, to our knowledge, the first attempt to measure 'efficiency' (intended in terms of outreach, that is, number of beneficiaries reached for a given amount of labour and capital inputs) of the specific group of social cooperatives in an empirical literature where the few existing empirical works concern mainly other cooperative types. Second, it evaluates the impact on outreach of different firm specific and local factors in order to find out which are the most important drivers of it. Third, it applies a methodological approach (multi-output stochastic distance function frontier) which takes into account the heterogeneity of activities in which social cooperatives are involved.

The paper is divided into five sections (introduction and conclusions included). In the second section we describe characteristics of the specific variant of social business represented by social cooperatives which are the object of our scrutiny. In the third section we describe our database and provide sample statistics. In the fourth section we discuss our methodology, present the econometric specification used to estimate drivers of outreach performance of social enterprises and comment our empirical findings. The fifth section concludes.

2 The specific characteristics of social cooperative firms

The origins of the cooperative movement lie in the decision to create non profit maximizing firms with the goal of prioritizing benefits for different categories of stakeholders. The two most traditional forms are *worker cooperatives* (where employees are the dominant stakeholder and attribute to themselves benefits under the form of higher wages, safer working conditions and/or participation to profits) and *consumer cooperatives* (where dominant stakeholders are the consumers and the benefits they attribute to themselves are lower prices and higher quality of goods), while other forms include credit and agricultural cooperatives. A main difference between traditional cooperatives and profit maximizing firms is in the different ranking of priorities among stakeholders when it comes to the destination of the value added created. According to the Italian law cooperatives are obliged to sidestep 30% of their profits in indivisible reserves of capital (*riserva legale*).⁸ The destination of the remaining profit share (70%) is constrained as well. It can be used to re-evaluate or remunerate capital shares of members. All what remains beyond it is generally reinvested in the firm activity or accumulated as additional voluntary reserve for self-financing and risk insurance purposes. While standard cooperative types fall into the traditional *circular mutuality* principle (a group creates an organization which is intended to return benefits to those who created it), social cooperatives extend the mutuality principle beyond direct to indirect forms of reciprocity⁹ (a group of citizens create an organization with the goal of producing benefits to third parties). More specifically, according to the Italian law 381/1991 which regulates them together with dlgs. 460/1997, the social cooperative goals are i) work integration of disadvantaged categories, ii) wellbeing of the community and iii) human being promotion. Social cooperatives are of two types. *Type A cooperatives* operate in health and education, while *type B cooperatives* are work integration enterprises whose specific goal is the productive reintegration of workers belonging to disadvantaged categories (disabled, ex-prisoners, ex-drug addicts) who must represent not less than 30 percent of the workforce.¹⁰

With respect to the traditional cooperative model, the law 381/1991 regulating social cooperatives introduces two additional distinctive features from a legal point of view. First, cooperatives must declare in their statutes the societal wellbeing goal for which they have been created. Second, social cooperatives may have a multi-stakeholder governance implying the possibility that more than one group of stakeholders (e.g. paid

8 The share is higher and up to 70% for cooperative banks (*Banche di Credito Cooperativo*) due to the need of guaranteeing patrimonial stability which is fundamental to achieve the goal of increasing the number of loans for community development. Even in case of bank closure reserves cannot be appropriated by shareholders while they are conferred to a national fund financing the start-up of new bank cooperatives.

9 For the literature on indirect reciprocity see, among others (Stanca 2010, Nowak and Sigmund 2005).

10 The first cooperative organization (a consumer cooperative of textile workers) was founded in 1843 in Rochdale, UK. The origins of worker cooperatives date back to 1831 when the first organization was founded in Paris from a carpenter association. Credit cooperatives were initiated by the pioneering work of Friedrich Wilhelm Raiffeisen who founded in 1849 the first rural bank, agricultural cooperatives originated at end '800 in Denmark, while the origin of social cooperatives which are object of our scrutiny is much more recent (1963 in Brescia).

workers, volunteer workers, users, and other institutions) is entitled the formal right to appoint the board of directors.

Research on social cooperatives is scant. Becchetti et al. (2012) analyse wage differentials in social cooperatives and document how intrinsic motivations work as a compensating differential while also increasing productivity of cooperative workers. Becchetti et al. (2013) analyze voluntary and involuntary transitions from profit firms to social cooperatives shedding light on the mechanisms which are beyond the wage differential between the two sectors. To our knowledge no empirical work focusing on the topic of social cooperative efficiency exists at the moment in the literature. Our paper aims to fill this gap.

3 The database and descriptive evidence

Our empirical analysis is based on an ISTAT sample of social (type A)¹¹ cooperatives drawn from a 2005 survey¹² where complete data (with non missing information for all our relevant variables) are available just for 3.357 cooperatives. On the whole sample, 27 percent of cooperatives come from the North West of Italy, 19.4 percent from the North-East, 14.8 percent from the Centre, 19.8 percent from the South and 19 percent from the Isles. Social enterprises are classified into different groups according to their prevailing sector of activity. Around 59 percent of social cooperatives operate in social assistance as prevailing field, 11 percent in culture, sport and recreational activities, 20 percent in research and education, while around 10 percent in health. 66 percent of

11 We limit our inquiry to type A cooperatives since in case of type B social cooperatives the statutory goal may come in conflict with our 'efficiency' measure. From a dynamic point of view many of the disadvantaged workers may become fully active workers across time but the 'inefficiency' costs of reintegration may be strong at the beginning and may persist for some categories of disadvantaged workers. Actually the problem is in the impossibility to have all the relevant information since efficiency should be calculated here for instance by evaluating the welfare costs of keeping disadvantaged individuals inactive against those of the 'reduced efficiency' implied by their reintegration in the workforce.

12 Questionnaires have been sent by ISTAT in November 2006 with ordinary mail (with two further checks and resubmission rounds for mail returned due to wrong addresses). The survey has been concluded in May 2007 and during all the survey time a green number for help in filling the questionnaire has been active.

The number of questionnaires sent has been of 8624: there have been 5501 units answering while 3123 non responding. The 3123 non responding units have been treated by using information available from other (statistical and administrative) sources. With the statistical system of the Chambers of Commerce (Telemaco) it has been possible for ISTAT to reconstruct information for 723 social cooperatives of which 325 active, 303 suspended and 95 ceased. Data for other 740 non responding units have been treated by updating information available in the 2003 statistical archive of social cooperatives. Overall the total number of social cooperatives (net of cancellation, suspensions duplications) in the survey turned out to be composed by 7363 units. Weights for treatment of missed answers related to active units in 2004 have been built on the basis of response rates and information on structure variables taken from statistical and administrative archives. The total number of our observations in our sample drops to 3357 units since we work in the smaller subsample of social cooperatives having all the information on regressors we use in the econometric analysis.

Table 1a – Descriptive statistics – average number of customers per service*

Services	N. Obs.	Mean	Std. Dev.	Std. Error	95% – Conf. Int.	
Educ	3357	7.652	78.821	1.360	4.984	10.319
RMT	3357	40.885	1031.762	17.808	5.971	75.800
HCS	3357	51.026	306.972	5.298	40.638	61.414
Meal	3357	55.919	1642.116	28.342	0.350	111.488
Recreational	3357	206.467	2130.434	36.770	134.374	278.561
SEA	3357	103.991	1126.843	19.449	65.859	142.123
Med	3357	81.147	1082.798	18.688	44.505	117.789
SocInc	3357	25.062	273.033	4.712	15.822	34.301
ListenGuid	3357	108.671	2237.687	38.621	32.948	184.394
Resident	3357	107.719	2255.437	38.927	31.395	184.043
Total customers**	3357	783.713	4718.028	81.430	614.055	933.370

*To comply with ISTAT rules on privacy and data disclosure, the maximum and minimum values of the variables cannot be published. Variable legend (see Table 2a). Variable legend Educ (Teaching services); RMT (Rescue and Medical transport services); HCS (Home care services); Meal (Catering services); Recreational (Recreational services); SEA (School educational assistance services for disabled); Med (Medical services); SocInc (Services for social inclusion); ListenGuid (Listening and guidance services); Resident (Residential services). **Total customers served on average per social cooperative as sum of the various services produced.

the cooperatives are affiliated to second level organizations (*centrali cooperative*), while around 40 percent of them is affiliated to consortia. On average 72 percent of cooperatives have revenues from public sector as their main financial source (Tables 1a and 1b). The average number of total beneficiaries reached by each organization with the various services produced is 783, average 2005 revenues are 866,000 Euros with average revenue per worker being around 25,000 Euros. Social cooperatives in the sample are on average 11-year old and employ on average 35 workers. The average number of contracts is around 2, the share of social enterprises with product innovation in the last two years around 45 percent. Slightly less than one fourth of social cooperatives experienced managerial turnover in the last two years. Less than half of them (46 percent) have monitoring processes. Only 14 percent of them have non individual entities as shareholders.

The variety in the average number of customers served per year according to the prevailing activity of operation reflects the heterogeneity of considered services. Note here that we average over the entire sample (including cooperatives which do not operate in the specific field of activity) and this significantly lowers average values of our statistics. Educational services are at the bottom with around 8 customers (disabled students who benefit from school educational assistance) served on average per social cooperative. They are closely followed by Social inclusion (25 customers reached). These two activities typically require dedicated care of social operators to very few recipients and this explains the lower number of customers served. Recreational services on the contrary are typically services addressed to a large public. They are therefore at the opposite extreme with 205 customers on average. Rescue and medical transport social cooperatives served on average 41 customers, while residential services around 108 customers, Listening and guidance services (also requiring time and care) reached on average 109 customers. Catering services on average 50 customers. Home care services 51 customers on average.

Table 1b – Descriptive statistics – other variables*

Variables	N. Obs.	Mean	Std. Dev.	Std. Error	95% – Conf. Int.	
Labour	3357	34.928	94.082	1.624	31.744	38.111
TotAss	3357	223,144	692.69	11,955	199,704	246,585
Fed	3357	0.666	0.472	0.008	0.650	0.682
Consortia	3357	0.396	0.489	0.008	0.380	0.413
FinSource	3357	0.725	0.447	0.008	0.710	0.740
ProvinceGDPpro	3357	22,094.4	6,058.3	104.56	21,889.46	22,299.34
Volunteer	3357	4.405	4.152	0.072	4.264	4.546
RegGradeShare	3357	23.065	3.189	0.055	22.957	23.172
Age	3357	11.321	7.954	0.137	11.051	11.590
ProductInn	3357	0.447	0.497	0.009	0.431	0.464
CustInn	3357	0.350	0.477	0.008	0.334	0.366
Monit	3357	0.462	0.499	0.009	0.445	0.479
ProgEc	3357	0.688	0.463	0.008	0.673	0.704
ManagerShare	3357	0.075	0.165	0.003	0.069	0.080
TurnOverManager	3357	0.282	0.450	0.008	0.267	0.298
ShareholderMeet	3357	1.478	0.681	0.012	1.455	1.501
ShareType	3357	0.136	0.343	0.006	0.125	0.148
NumContracts	3357	1.726	5.038	0.087	1.555	1.896
NumShareholders	3357	44.406	132.013	2.278	39.938	48.873

*To comply with ISTAT rules on privacy and data disclosure, the maximum and minimum values of the variables cannot be published. Variable legend Labour (Number of workers of cooperatives); TotAss (Value of assets of cooperatives – net of amortization and depreciation); Area (Dummy depending on location of cooperative in Italy – North West, North East, Centre, South and Isles); ProvinceGDPpro (Province's Gross Domestic Product pro-capita); RegGradeShare (Region's share of inhabitants with a university degree); Fed (0/1 Dummy if the cooperative belongs to a federation of cooperatives); Consortia (0/1 Dummy if the cooperative belongs to a consortium); Age (Years of activity of the cooperative); ProductInn (0/1 Dummy if the cooperative made in the last two years product/services innovation); CustInn (0/1 Dummy if the social cooperative identified in the last two years new segments of customers); Monit (0/1 Dummy if the social cooperative developed auditing activities in the last two years); FinSource (0/1 Dummy if the main source of revenues of cooperative comes from public sector); ProgEc (0/1 Dummy if the cooperative made in the last two years target programming activities); ManagerShare (Share of managers in the cooperative workforce); TurnOverManager (0/1 Dummy if the cooperative realized a partial or total turnover of the managers in the last two years); ShareholderMeet (Number of the annual shareholder meetings); ShareType (0/1 Dummy if the cooperative among the shareholders has entities different from individuals); NumContracts (Number of outstanding contracts of the cooperative); Volunteer (Number of not occasional volunteers of the cooperative); NumShareholders (Number of shareholders with voting rights of the cooperative).

4 Econometric specification

The literature on the evaluation of productive efficiency of social business and, more specifically, of social cooperatives is scant not only for the paucity of contributions but also for some serious methodological problems. Since social cooperatives are mainly involved in human care services and are non profit maximizing organizations with the goal of mutuality, cost/income variables do not seem to be the best efficiency measures to look at. In addition to these institutional and structural factors, other sources of 'inefficiency' may add up. According to Hansmann (1996) efficiency in cooperatives may be lower due to the lack of residual claims on property rights by a specific stakeholder group (such as shareholders in for profit companies). The argument is that the cooperative organization may have problems in coordinating the interests of different types of stakeholders with more inefficient and lengthy decision processes. Rejecting this

hypothesis several studies have however demonstrated that cooperatives may overperform non cooperative profit maximizing companies in terms of production efficiency (Craig and Pencavel 1992, 1994, Bartlett et al. 1992: Bonin et al. 1993, Burdìn and Dean 2009, Burdìn 2012). Similar findings are obtained by Cutler and Berndt (2001) on medical services, by Krueger and Malečkov (2003) on education and by Destefanis and Maietta (2001), comparing profit and not for profit organizations providing communal services in Italy. By commenting the latter Turati (2001) points out that the documented lack of difference in efficiency could be due to the fact that managers of not for profit organizations, even without the profit maximization goal, are always looking for efficiency motivated by intrinsic reasons related to their reputation. The rationale explaining these results may be found in productive processes which favour inclusion more than hierarchy (Borzaga and Tortia 2010) fostering distributive fairness and stimulating workers' intrinsic motivations. Without arriving to the extreme of the Freeman (1997) paradox of volunteers which 'work for nothing' due to the consonance between their ideals and the mission of the organization, social cooperative missions may stimulate workers' productivity even without monetary incentives. Rationales for the good performance in terms of productivity and efficiency are for Stiglitz (2009) job satisfaction, quality of the workplace and workers participation and involvement in organizational goals.¹³ Due to all these reasons cooperatives may play a significant role in terms of social cohesion and growth's sustainability (Dow 2003, Stiglitz 2009, Birchall 2010).

The analysis of efficiency of cooperative organizations and more so that of social cooperatives presents several methodological problems. While the objective function of for-profit firms is profit maximization, the objective function of non-profit organizations is less clear-cut and very often multi-dimensional. This not only makes more complicated the assessment work of the stakeholders (Hansmann 1996, p. 239), but also potentially biases the empirical measurement of efficiency. Based on the above mentioned more general problem of finding the proper efficiency indicator for this specific class of productive organizations we follow the claim of Pestieau and Tulkens (1993) who argue that the most qualified indicator is technical efficiency measured as a ratio between results and resources engaged. This is why we decide to use as efficiency measure a proxy of social cooperative outreach intended as the ratio between the number of beneficiaries served for a given level of physical (labour and capital) inputs. In this sense our research focuses more on 'efficiency' in producing an intermediate output of social cooperative action (outreach) than on the measurement of its final outcome intended as the impact on the quality of life of beneficiaries of social cooperative activity (Malley and Fernandez 2010).

This choice leads us to focus on technical inefficiency leaving out economic inefficiency. A formal definition of technical efficiency is given by Koopmans (1951) and is based on physical quantities (how many units of output are produced for a given level of inputs). It is possible to define a firm technically efficient if and only if it is not possible to improve at least one output given the level of inputs, or to reduce at least just one input given the production target. The choice of our efficiency measure is further motivated by the fact that the ISTAT dataset has no information on output prices and input

13 'Systems in which there is more participation, more openness, and more transparent management can also be important in spreading an entrepreneurial culture, where everybody in the firm is part of the decision-making process, which can increase efficiency in the enterprise' 'Finally, a higher quality of workplace improves not only the quality of life but also productivity.'

costs. At the same time technical efficiency does not require any assumption on managerial behaviour (profit maximization or any other kind of maximization or minimization subject to some constraint) and this is a desirable property given that cooperatives are multi-stakeholder and not for profit productive organizations.

The TE measures devised by Debreu (1951) and Farrell (1957) are respectively input and output oriented measures. Outputs of social cooperatives end up being markedly heterogeneous given the variety of activities in which they are involved. Even though production processes share the common characteristic of being labour intensive important differences arise since home care services require quite exclusively workers as input, while residential services (e.g. homes for abandoned children) require also infrastructures. To overcome the problem of heterogeneity in production functions we use multi-output distance functions (see Shephard 1953) to measure the technical efficiency (TE), where $TE_o(x, y) = [\max\{\tau : D_o(x, \tau y) \leq 1\}]^{-1}$ is an output oriented measure of TE, $D_o(x, y) = \min\{\mu : y/\mu \in P(x)\}$ is the output distance function and $P(x)$ is the output set, with $\mu \leq 1$ being a deflator that indicates how much output can be increased given the inputs used in production and given the available technology (it is equal to 1 if a cooperative is fully efficient and its production is in on the frontier).

More specifically, within the technical efficiency literature our empirical analysis hinges on the framework of stochastic frontier analysis¹⁴ (Aigner et al. 1977, Meeusen and van den Broeck 1977). SFA is based on the following stochastic production frontier

$$y_i = f(x_i, \beta) \exp(v_i - u_i) \quad (1)$$

where y_i is the output produced by the i -th cooperative, x_i is the vector of inputs and β the vector of parameters of the production function $f(\cdot)$ while the last term is a composite error term. By assumption no producer lies on the frontier and this allows to separate the distance of a cooperative from the frontier of the feasible output realizations into two terms: $\varepsilon_i = v_i - u_i$. The first term is the pure stochastic deviation from the feasible output (given the technology) and it is caused by random shocks not under the control of the cooperative. The second non random component strictly refers to inefficiency. This second type of deviation is the object of our analysis.

Based on these considerations it is possible to define the following distance function

$$D_o(x_i, y_i; \beta) = \frac{y_i}{f(x_i, \beta)} = \exp(u_i - v_i). \quad (2)$$

The multi output essence of cooperatives and our distance function require specific approach for the empirical estimation. Early works on estimation of distance functions are conducted by Lovell et al. (1994), Grosskopf et al. (1997) and Coelli and Perelman (1999).

¹⁴ We prefer a parametric approach even if it requires the choice of a specific functional form for the production function since other non parametric methods such as Data Envelopment Analysis do not allow to distinguish between the random component and a non random component of deviations from the frontier due to inefficiency.

Stochastic distance function can be rewritten in this way

$$1 = D_o(x_i, y_i; \beta) \exp(u_i - v_i) \tag{3}$$

By exploiting the property that a distance function is linearly homogenous ($D_o(x_i, ky_i; \beta) = kD_o(x_i, y_i; \beta)$ for any $k > 0$) and imposing that $k = \frac{1}{y_M}$ with y_M being one of the outputs produced by cooperatives (see Coelli and Perelman 1996), it is possible to write $D_o(x_i, y_{mi}; \beta) = y_M D_o(x_i, y_{mi}/y_M; \beta)$. After dividing both sides of the equation (3) by y_M our stochastic distance function becomes

$$\frac{1}{y_M} = D_o(x_i, y_{mi}/y_M; \beta) \exp(u_i - v_i).$$

Since the SFA requires a parametric form, we choose a translog¹⁵ form. By taking logs we get the following specification¹⁶

$$\begin{aligned} -\ln(y_{Mi}) = & \beta_0 + \sum_{s=1}^{S-1} \beta_s \ln\left(\frac{y_{si}}{y_{Mi}}\right) + \frac{1}{2} \sum_{s=1}^{S-1} \sum_{n=1}^{M-1} \beta_{sn} \ln\left(\frac{y_{si}}{y_{Mi}}\right) \ln\left(\frac{y_{ni}}{y_{Mi}}\right) \\ & + \sum_{k=1}^2 \theta_k \ln(x_{ki}) + \theta_{12} \ln(x_{1i}) \ln(x_{2i}) + \sum_{k=1}^K \sum_{s=1}^{S-1} \eta_{ks} \ln\left(\frac{y_{si}}{y_{Mi}}\right) + v_i - u_i \end{aligned} \tag{4}$$

The dependent variable y_{Mi} is one of the outputs/services provided by the i -th cooperative and it is equal to minus the log of the number of disabled students who benefit of school educational assistance (SEA). This service is used for the normalization of the equation. The other components of the translog function are i) the constant term (with coefficient β_0), ii) the other outputs/services different from the benchmark y_{si} ($s = 1 \dots S-1$) divided by the benchmark output/service (where the other services considered are: Educ (teaching services), RMT (rescue and medical transport), HCS (home care services), Meal (catering services), Recreational (recreational services), Med (medical services), SocInc (services for social inclusion), ListenGuid (listening and guidance services) and Resident (residential services), iii) the interactions between services (all normalized by SEA) and their β_{sn} s coefficients with ($s = 1, \dots, S-1$) ($n = 1, \dots, M-1$) $s \neq M$ and $n \neq M$; iv) the input quantities $x_{k,s}$ ($k = 1, 2$) where inputs are Labour (the number of workers) and TotAss (the value of total assets net of depreciation and amortization); v) their interactions and vi) the interaction between inputs and normalized outputs/services. The final term is the composite error $v_i - u_i$. By assumption v_i is the stochastic symmetric component of the error term with ($v_i \sim \text{iidN}(0, \sigma_v^2)$), while u_i is nonnegative with mean μ and variance σ_u^2 with a truncated normal distribution ($u_i \sim \text{iidN}^+(\mu, \sigma_u^2)$) as suggested by

15 As is well known, the translog function is more flexible than a Cobb-Douglas function, it is linear in parameters and does not impose many restrictions on production and substitution elasticities. The translog however requires the estimation of many parameters (but the size of our sample is sufficiently great) and the coefficients of the production function are more difficult to be interpreted (a minor problem in our research since we are mainly interested in analyzing the determinants of the inefficiency).

16 The multioutput stochastic distance function is estimated with the Stata routine created by Atella et al. (2013).

Stevenson (1980). Both error terms are independently distributed, hence independent from each other and from the regressors.

Two-step approaches to the estimation of translog – first step the inefficiency and second step the coefficients of explicatory variables of the inefficiency (as in Pitt and Lee (1981) and Kalirajan (1981)) – are subject to the well-known bias described by Wang and Schmidt (2002). We therefore estimate simultaneously the parameters of the frontier production function, the magnitude of inefficiency and the coefficients of its explanatory variables as in Kumbhakar et al. (1991), Reifschneider and Stevenson (1991) and Huang and Liu (1994) and, for panel data, Battese and Coelli (1995).

In the second equation of our simultaneous two-equation system we replace the mean of u_i with the expression $z_i\delta$, where z is a vector of variables which are supposed to affect inefficiency, while δ is a vector of coefficients to be estimated. More specifically, we model inefficiency u_i as a truncated normal with the following specification

$$\begin{aligned}
 u_i = & \delta_0 + \delta_1 \text{area}_i + \delta_2 \ln(\text{CounteeGDPpro}_i) + \delta_3 \text{RegGradeShare}_i + \delta_4 \text{Fed}_i + \delta_5 \text{Consortia}_i + \\
 & + \delta_6 \ln(\text{age}_i) + \delta_7 \text{ProductionInn}_i + \delta_8 \text{CustInn}_i + \delta_9 \text{Monit}_i + \delta_{10} \text{FinSource}_i + \delta_{11} \text{ProgEc}_i + \\
 & + \delta_{12} \text{ManagerShare}_i + \delta_{13} \text{TurnOverManager}_i + \delta_{14} \ln(\text{ShareHolderMeeting}_i) + \\
 & \delta_{15} \text{ShareType}_i + \delta_{16} \ln(\text{NumContracts}_i) + \delta_{17} \ln(\text{Volunteers}_i) + \\
 & + \delta_{18} \ln(\text{NumShareholders}_i) + \vartheta_i
 \end{aligned} \tag{5}$$

where ϑ_i is the random error component characterized by variance σ_ϑ^2 , δ_0 is the constant, *Area* are five Italian macroarea dummies which refer to the cooperative location (NorthWest, NorthEast, Centre, South and Isles, with NorthWest being the omitted benchmark), *ProvinceGDPpro* is the province GDP procapita, *RegGradeShare* is the share of inhabitants with a university degree in the region of the cooperative in the above 25 year age cohort and *Consortia* and *Fed* are two dummies taking value one if the social enterprise is affiliated to consortia or to a federation respectively.¹⁷ Among other controls, *Age* measures years of activity of the social enterprise. *ProductInn*, *CustInn*, *Monit*, *ProgEc* and *TurnOverManager* are dummies which take value 1 if, in the last two years, the cooperative respectively made product or service innovation, identified new segments of customers, developed auditing activities, target programming activities and realized a partial or total turnover of the managers. *FinSource* is a dummy variable which is equal to 1 if the main source of revenues come from public sector. *ManagerShare* is the share of managers in the social cooperative workforce, *ShareHolderMeeting* measures the number of the annual shareholder meetings. *ShareType* is equal to 1 when entities different from individuals – other cooperatives, public administrations, private firms – are among social cooperative shareholders (zero otherwise). *NumContract* is the number of outstanding contracts, while *NumShareholders* and *Volunteers* are respectively the number of shareholders with voting rights and the number of volunteers and v_i is the random error component characterized by variance σ_v^2 .

17 Both consortia and federations are second level organizations to which single social cooperative may affiliate in order to receive services.

4.1 Empirical findings

In our comments on empirical findings we focus primarily on the explanatory variables of inefficiency (see Table 2a).¹⁸ A first important result is that values of λ (the ratio between the variance of the non random component to the variance of the random component) document that the main source of variance is due to a non random inefficiency component so that the stochastic frontier approach we use is validated by our data.

Among outreach determinants we document that social cooperatives are significantly closer to the frontier when they declare to have created new products or reached new types of customers in the last two years. This first finding is important since it indicates that innovation is a fundamental source of efficiency also in this sector.

On the contrary, a higher number of contracts increases inefficiency by making social enterprises significantly more distant from the frontier. The result on the negative impact of business agreements (most of them with the public sector as shown in descriptive analysis) is highly likely indicate that social cooperatives suffer from diseconomies of scope and, as such, they lose outreach when, *ceteris paribus* and for a given level of inputs, they have to work for too many different business contracts. What is more likely however is as well that the work with the public sector, which is generally won in auctions at the lowest price has negative impact on outreach.¹⁹ This may be a consequence of the lowest price structure of the auction itself which reduces the quality of the service.

The negative impact of volunteers is not surprising. Volunteers are not just a productive factor but also a valuable outcome of social cooperatives since they document that the latter produce social capital in terms of willingness to give time for the cooperative activity on behalf of individuals who are close to the social cooperative life and do not suffer from informational asymmetries on its quality. In this sense volunteer work may be conceived as a signal of the social quality of the cooperative activity. On the other side however volunteer workers are quite likely to provide their complimentary labour services more occasionally and with lower on-the-job accumulated skills than full time paid workers. It is therefore reasonable that a social cooperative with a labour force of full time workers has superior outreach than a social cooperative in which part of the 'hidden labour force' is represented by volunteers.

The positive effect of age on outreach is expected. It hides a learning by doing effect but it is also highly likely to conceal a survivorship bias since, at higher distance from their foundation, only the best social cooperatives survive and therefore the observed

18 As already explained in footnote 10 interpretation of the translog equation is not particularly informative in terms of signs and magnitudes of inputs coefficients due to the many interactions and nonlinearities which divide the significant impact on production on many different parameters.

19 Marocchi et al. (2009) have recently shown in an inquiry in the Italian region of Piedmont that 30% of social enterprises winning public auctions have been chosen exclusively or mainly on the basis of the lowest price criterion and that two thirds of them have considered starting prices as inadequate. The research concludes by arguing that, in spite of some progresses in bidding mechanisms which partially depart from the lowest price criterion, the mechanisms in place still produce low quality services and unfair workers remunerations.

Table 2a – Econometric estimation (full sample)

	A	B	C	D	E	F
	<i>Part 1 – Estimation of production function (Translog)</i>					
Recreational	0.0000180 (0.0000977)	0.0000195 (0.0001064)	0.0000118 (0.0000716)	0.0000245 (0.000117)	0.0000124 (0.0000762)	0.0000212 (0.0001302)
Med	0.0000365 (0.0001441)	0.0000374 (0.0001578)	0.0000205 (0.0001031)	0.0000506 (0.0001684)	0.0000269 (0.0001098)	0.0000391 (0.0001857)
SocInc	-0.0000149 (0.0001807)	0.0000400 (0.0002197)	0.0000216 (0.000141)	0.0000465 (0.0002299)	0.000023 (0.0001481)	0.0000345 (0.0002546)
ListenGuid	-0.0000055 (0.00014)	0.0000172 (0.0001601)	0.00000921 (0.0001065)	0.0000236 (0.0001749)	0.0000121 (0.0001131)	0.0000211 (0.0001946)
Resident	0.0000540 (0.0001337)	0.0000573 (0.0001664)	0.0000289 (0.0001037)	0.0000711 (0.0001676)	0.0000373 (0.0001064)	0.0000581 (0.0001878)
Educ	0.183*** (0.001)	0.183*** (0.0005738)	0.222*** (0.0011048)	0.202*** (0.0013395)	0.2*** (0.0006197)	0.18*** (0.0006036)
RMT	0.817*** (0.001)	0.816*** (0.0007682)	0.778*** (0.001144)	0.797*** (0.0014004)	0.8*** (0.0006756)	0.819*** (0.000812)
HCS	0.0000017 (0.0001146)	0.0000288 (0.0001249)	0.0000153 (0.0000823)	0.0000395 (0.0001353)	0.0000174 (0.0000882)	0.0000317 (0.0001493)
Meal	0.0000524 (0.0001746)	0.0000541 (0.0001929)	0.000027 (0.0001233)	0.0000653 (0.0002033)	0.0000359 (0.0001327)	0.000059 (0.0002243)
Recreational*Recreational	-0.0000003 (0.000011)	-0.0000006 (0.0000117)	-0.000000305 (0.0000794)	-0.000000626 (0.000013)	-0.000000145 (0.0000857)	-0.000000441 (0.0000145)
Recreational*Med	-0.0000016 (0.0000142)	0.0000009 (0.0000168)	0.00000401 (0.0000106)	0.00000333 (0.0000176)	0.00000297 (0.0000113)	0.00000269 (0.0000199)
Recreational*SocInc	0.0000042 (0.0000169)	0.0000000 (0.0000187)	-0.00000284 (0.0000122)	-0.000000376 (0.0000203)	-0.000000305 (0.0000132)	-0.000000347 (0.0000225)
Recreational*ListenGuid	0.0000016 (0.0000126)	0.0000003 (0.0000136)	0.000000145 (0.0000904)	0.000000441 (0.0000151)	0.000000316 (0.0000982)	0.000000213 (0.0000168)
Recreational*Resident	-0.0000020 (0.0000144)	0.0000015 (0.0000179)	0.00000478 (0.0000113)	0.000000769 (0.0000184)	0.00000054 (0.0000118)	0.000000569 (0.0000208)
Recreational*Educ	-0.0001606 (0.0001417)	0.0000648 (0.0001**)	-0.0005*** (0.0000698)	0.001*** (0.0000688)	-0.004*** (0.000088)	0.002*** (0.0001064)
Recreational*RMT	0.0001621 (0.0001461)	0.0001** (0.0000789)	0.005*** (0.0000736)	-0.001*** (0.0000948)	0.004*** (0.000094)	-0.002*** (0.0001126)
Recreational*HCS	0.0000003 (0.0000125)	0.0000002 (0.0000134)	-0.000000096 (0.00000886)	-0.000000485 (0.0000146)	-0.000000096 (0.0000957)	-0.000000369 (0.0000163)

Continued

Table 2a – Continued

	A	B	C	D	E	F
	<i>Part 1 – Estimation of production function (Translog)</i>					
Recreational*Meal	-0.0000030 (0.0000156)	-0.0000017 (0.0000195)	-0.00000904 (0.0000124)	-0.00000193 (0.0000206)	-0.000000771 (0.0000134)	-0.00000196 (0.0000228)
Med*Med	0.0000011 (0.0000156)	0.0000033 (0.0000175)	0.00000157 (0.0000112)	0.0000021 (0.0000181)	0.00000139 (0.0000119)	0.00000183 (0.0000202)
Med*SocInc	0.0000000 (0.0000202)	-0.0000021 (0.0000243)	-0.000000324 (0.0000154)	-0.000000335 (0.0000249)	-0.0000023 (0.000016)	-0.00000359 (0.0000279)
Med*ListenGuid	-0.0000002 (0.0000133)	-0.0000003 (0.000015)	-0.000000382 (0.00000976)	-0.000000615 (0.000016)	-0.000000435 (0.0000104)	-0.000000754 (0.0000177)
Med*Resident	0.0000017 (0.000017)	0.0000108 (0.0000225)	0.00000537 (0.0000136)	0.000012 (0.000022)	0.00000726 (0.000014)	0.0000105 (0.0000249)
Med*Educ	0.001*** (0.0001)	0.001*** (0.0000374)	0.005*** (0.0000711)	0.001*** (0.0000619)	0.006*** (0.000087)	0.002*** (0.0000576)
Med*RMT	-0.001*** (0.0001)	-0.001*** (0.0000725)	-0.005*** (0.0000541)	-0.001*** (0.0000945)	-0.006*** (0.0000745)	-0.002*** (0.0000631)
Med*HCS	-0.0000018 (0.0000144)	0.0000022 (0.0000161)	0.00000144 (0.0000104)	0.00000297 (0.0000171)	0.00000193 (0.0000112)	0.00000234 (0.000019)
Med*Meal	0.0000011 (0.0000217)	0.0000093 (0.0000259)	0.00000485 (0.0000166)	0.0000108 (0.0000274)	0.00000665 (0.0000178)	0.00000964 (0.0000306)
SocInc*SocInc	-0.0000015 (0.0000238)	-0.0000034 (0.0000266)	-0.00000152 (0.0000178)	-0.00000425 (0.0000291)	-0.0000025 (0.0000189)	-0.00000337 (0.0000323)
SocInc*ListenGuid	-0.0000005 (0.0000159)	0.0000029 (0.0000184)	0.00000119 (0.000012)	0.000003 (0.0000199)	0.00000173 (0.0000129)	0.0000027 (0.0000223)
SocInc*Resident	-0.0000002 (0.0000232)	-0.0000041 (0.0000276)	-0.00000122 (0.0000175)	-0.00000537 (0.0000289)	-0.00000365 (0.0000186)	-0.00000627 (0.0000324)
SocInc*Educ	0*** (0.0000769)	0*** (0.0000516)	0.002*** (0.000039)	-0.001*** (0.0000749)	0.002*** (0.0000588)	-0.001*** (0.0000779)
SocInc*RMT	0*** (0.0000922)	0*** (0.000085)	-0.002*** (0.0000586)	0.001*** (0.0001014)	-0.002*** (0.0000736)	0.001*** (0.0001093)
SocInc*HCS	0.0000037 (0.0000218)	0.0000000 (0.0000243)	0.000000359 (0.0000158)	0.00000161 (0.0000264)	0.000000357 (0.0000171)	0.00000181 (0.0000295)
SocInc*Meal	-0.0000005 (0.0000267)	-0.0000028 (0.0000287)	-0.000000456 (0.0000192)	-0.00000255 (0.0000318)	-0.00000233 (0.0000209)	-0.00000323 (0.0000348)
ListenGuid*ListenGuid	-0.0000019 (0.0000157)	-0.0000009 (0.0000173)	-0.000000415 (0.0000116)	-0.00000118 (0.0000191)	-0.000000965 (0.0000125)	-0.000000849 (0.000012)

Continued

Table 2a – Continued

	A	B	C	D	E	F
ListenGuid*Resident	0.000017 (0.000018)	-0.000003 (0.0000203)	0.00000324 (0.0000133)	0.00000188 (0.000022)	-0.000000409 (0.0000142)	0.00000277 (0.0000247)
ListenGuid*Educ	0.002*** (0.0001)	0.002*** (0.0000686)	0.002*** (0.000052)	0.001*** (0.0000945)	0.002*** (0.0000647)	0.001*** (0.000089)
ListenGuid*RMT	-0.002*** (0.0000881)	-0.002*** (0.0000839)	-0.002*** (0.0000605)	-0.001*** (0.0001078)	-0.002*** (0.0000726)	-0.001*** (0.000106)
ListenGuid*HCS	0.000013 (0.0000157)	0.0000133 (0.0000173)	0.0000072 (0.0000114)	0.0000012 (0.000019)	0.00000243 (0.0000123)	0.0000107 (0.0000212)
ListenGuid*Meal	0.000028 (0.0000195)	0.0000014 (0.0000208)	0.000000616 (0.0000139)	0.000000901 (0.0000233)	0.000000409 (0.0000154)	0.0000012 (0.0000256)
Resident*Resident	0.000000 (0.0000146)	0.00000611 (0.0000205)	0.00000294 (0.0000121)	0.00000587 (0.0000191)	0.00000376 (0.0000122)	0.000005 (0.0000216)
Resident*Educ	-0.002*** (0.0000577)	-0.002*** (0.0000547)	-0.002*** (0.000054)	-0.002*** (0.0000804)	-0.002*** (0.0000538)	-0.002*** (0.0000625)
Resident*RMT	0.002*** (0.000072)	0.002*** (0.0000786)	0.002*** (0.0000646)	0.002*** (0.0000781)	0.002*** (0.0000634)	0.002*** (0.0000856)
Resident*HCS	-0.0000021 (0.0000152)	0.00000071 (0.0000191)	0.000000377 (0.0000118)	-0.000000282 (0.0000191)	0.000000121 (0.0000123)	-0.0000007 (0.0000215)
Resident*Meal	0.0000016 (0.0000217)	0.00000957 (0.0000262)	0.00000462 (0.0000164)	0.00000121 (0.0000273)	0.00000735 (0.0000177)	0.0000109 (0.0000306)
Educ*Educ	-0.043*** (0.0001088)	-0.043*** (0.0000864)	-0.042*** (0.0000491)	-0.045*** (0.0001024)	-0.042*** (0.0000502)	-0.044*** (0.0000683)
Educ*RMT	0.109*** (0.0001527)	0.109*** (0.0002017)	0.109*** (0.0001258)	0.111*** (0.0001563)	0.109*** (0.0001217)	0.11*** (0.000195)
Educ*HCS	-0.023*** (0.0000993)	-0.023*** (0.0000844)	-0.024*** (0.0000663)	-0.025*** (0.0000973)	-0.023*** (0.0000711)	-0.024*** (0.000083)
Educ*Meal	***0.001 (0.0001694)	0.001*** (0.0001704)	-0.004*** (0.0001035)	0.006*** (0.0003433)	-0.006*** (0.0001326)	0.003*** (0.000193)
RMT*RMT	-0.067*** (0.0000551)	-0.067*** (0.0000554)	-0.067*** (0.0000316)	-0.066*** (0.0000747)	-0.067*** (0.0000372)	-0.066*** (0.0000739)
RMT*HCS	0.023*** (0.000103)	0.023*** (0.0000928)	0.024*** (0.0000688)	0.025*** (0.000104)	0.023*** (0.0000746)	0.024*** (0.0000929)
RMT*Meal	-0.001*** (0.0001719)	-0.001*** (0.0001645)	0.004*** (0.0001144)	-0.006*** (0.0003267)	0.006*** (0.000141)	-0.003*** (0.0001785)
HCS*HCS	-0.0000012 (0.0000174)	-0.00000478 (0.0000175)	-0.00000301 (0.0000118)	-0.00000758 (0.0000195)	-0.00000383 (0.000013)	-0.0000073 (0.0000214)

Continued

Table 2a – Continued

	A	B	C	D	E	F
	<i>Part 1 – Estimation of production function (Translog)</i>					
HCS*Meal	-0.000035 (0.000189)	-0.00000509 (0.0000212)	0.000000824 (0.000014)	0.000000194 (0.0000233)	-0.000000323 (0.0000153)	-0.000000264 (0.0000258)
Meal*Meal	-0.000020 (0.000187)	0.00000308 (0.00002)	0.00000148 (0.0000135)	0.00000412 (0.0000227)	0.00000263 (0.0000152)	0.00000335 (0.0000243)
Labour	-0.000075 (0.0002093)	-0.0000852 (0.0002767)	-0.0000447 (0.000169)	-0.000108 (0.0002723)	-0.0000584 (0.0001717)	-0.0000845 (0.0003059)
TotAss	-0.000025 (0.0000576)	-0.0000246 (0.0000645)	-0.00000225 (0.0000421)	0.00000172 (0.0000688)	0.00000141 (0.0000445)	0.00000172 (0.0000761)
Labour*Labour	-0.000005 (0.0000407)	0.0000411 (0.0000685)	0.0000204 (0.0000392)	0.0000486 (0.0000623)	0.0000288 (0.0000385)	0.0000442 (0.0000711)
Labour*TotAss	0.000089 (0.0000197)	-0.0000142 (0.0000271)	-0.0000037 (0.0000165)	-0.00000179 (0.0000267)	-0.00000182 (0.000017)	-0.00000307 (0.0000301)
TotAss*TotAss	-0.000007 (0.00000372)	0.00000291 (0.00000418)	0.000000368 (0.00000275)	0.000000467 (0.0000045)	0.000000099 (0.00000294)	-0.000000972 (0.00000497)
Labour*Recreational	0.000027 (0.0000251)	-0.0000646 (0.0000333)	-0.00000293 (0.000021)	-0.00000558 (0.0000338)	-0.00000342 (0.0000216)	-0.00000566 (0.0000382)
Labour*Med	-0.000011 (0.0000351)	-0.0000292 (0.0000498)	-0.0000145 (0.0000297)	-0.0000329 (0.0000477)	-0.0000197 (0.00003)	-0.0000292 (0.0000539)
Labour*SocInc	-0.0000133 (0.0000472)	0.0000111 (0.0000606)	0.00000267 (0.0000378)	0.00001 (0.0000615)	0.00000845 (0.0000391)	0.0000108 (0.0000686)
Labour*ListenGuid	-0.000086 (0.0000349)	-0.00000413 (0.0000461)	-0.00000279 (0.0000296)	-0.00000287 (0.0000486)	-0.00000665 (0.000031)	-0.00000254 (0.0000546)
Labour*Resident	-0.000035 (0.0000352)	-0.0000381 (0.0000591)	-0.0000186 (0.0000333)	-0.0000429 (0.0000528)	-0.0000253 (0.0000324)	-0.0000381 (0.0000602)
Labour*Educ	0.008*** (0.0003275)	0.008*** (0.0002007)	0.002*** (0.0001237)	0.014*** (0.0003381)	0.001*** (0.0001684)	0.012*** (0.0002262)
Labour*RMT	-0.008*** (0.0003306)	-0.008*** (0.0002106)	-0.002*** (0.000106)	-0.014*** (0.0003957)	-0.001*** (0.0001574)	-0.012*** (0.0002931)
Labour*HCS	0.0000038 (0.0000308)	-0.0000021 (0.0000421)	-0.000000969 (0.0000258)	-0.00000164 (0.0000419)	-0.00000116 (0.0000267)	-0.00000652 (0.0000473)
Labour*Meal	0.0000003 (0.0000459)	-0.0000400 (0.0000717)	-0.0000197 (0.0000432)	-0.0000505 (0.0000712)	-0.0000296 (0.0000451)	-0.0000454 (0.0000801)
TotAss*Recreational	-0.000022 (0.00000797)	-0.0000002 (0.00000917)	-0.000000291 (0.00000604)	-0.000000555 (0.00000985)	-0.000000305 (0.0000064)	-0.00000023 (0.000011)
TotAss*Med	-0.0000035 (0.0000136)	0.0000011 (0.0000153)	0.000000309 (0.00000995)	0.00000147 (0.0000163)	0.0000011 (0.0000106)	0.00000204 (0.000018)

Continued

Table 2a – Continued

	A	B	C	D	E	F
<i>Part 2 – Estimation of inefficiency model</i>						
ProductInn			-4.093***	-2.587***	-2.541***	-2.867***
CustInn			-0.689	-0.612	-0.555	-0.596
Monit			-2.069**	-1.271*	-1.383**	-1.235*
FinSource			-0.637	-0.575	-0.512	-0.559
ProgEc			0.261	1.051*	0.942*	1.070*
ManagerShare			-0.569	-0.529	-0.465	-0.512
TurnOverManager			0.643	0.688	0.923	0.766
ShareholderMeet			-0.632	-0.576	-0.515	-0.562
ShareType			-4.508***	-3.871***	-3.803***	-3.645***
NumContracts			-0.643	-0.579	-0.513	-0.554
Volunteer			0.676	0.953	1.584	-0.215
NumShareholders			-1.285	-1.304	-1.074	-1.295
Cons			-1.694**	-1.673**	-1.502**	-1.589**
σ_u			-0.606	-0.539	-0.481	-0.523
σ_v				1.815**	1.365**	1.767**
λ				-0.557	-0.488	-0.542
				-6.604***	-6.855***	-6.976***
				-0.993	-0.954	-1.02
				2.034***	1.832***	1.882***
				-0.264	-0.249	-0.27
				1.847***	1.842***	
				-0.264	-0.247	
					0.01	0.493*
					-0.22	-0.23
					-20.83	-22.329
					-6.934	-7.583
					0.875***	0.904***
					(0.028)	(0.026)
					0.001***	0.001***
					(0.0001)	(0.0001)
					1598.8***	1475.1***
					(0.025)	(0.026)

Continued

Table 2a – Continued

Part 2 – Estimation of inefficiency model					
A	B	C	D	E	F
μ	0.058	0.058	0.058	0.058	0.058
N. Obs.	3199	3146	3146	3146	3146
Log L.	5913.427	5957.759	5992.757	5998.511	5986.591
AIC	-11652	-11788	-11783	-11793	-11771
BIC	-11124	-11247	-11172	-11175	-11159

$\lambda = \frac{\sigma_u^2}{\sigma_v^2}$, Tech. efficiency = e^{-u} (if 0 complete inefficiency, if 1 perfect efficiency)
 Educ (Teaching services); RMT (Rescue and Medical transport services); HCS (Home care services); Meal (Catering services); Recreational (Recreational services); SEA (School educational assistance services for disabled); Med (Medical services); SocInc (Services for social inclusion); ListenGuid (Listening and guidance services); Resident (Residential services); Labour (Number of workers of cooperatives); TotAss (Value of assets of cooperatives – net of amortization and depreciation); Area (Dummy depending on location of cooperative in Italy – North West, North East, Centre, South and Isles); ProvinceGDPpro (Provinces Gross Domestic Product pro-capita); RegGradeShare (Region's share of inhabitants with a university degree); Fed (0/1 Dummy if the cooperative belongs to a federation of cooperatives); Consortia (0/1 Dummy if the cooperative belongs to a consortium); Age (Years of activity of the cooperative); ProductInn (0/1 Dummy if the cooperative made in the last two years product/services innovation); CustInn (0/1 Dummy if the social cooperative identified in the last two years new segments of customers); Monit (0/1 Dummy if the social cooperative developed auditing activities in the last two years); FinSource (0/1 Dummy if the main source of revenues of cooperative comes from public sector); ProgEc (0/1 Dummy if the cooperative made in the last two years target programming activities); ManagerShare (Share of managers in the cooperative workforce); TurnOverManager (0/1 Dummy if the cooperative realized a partial or total turnover of the managers in the last two years); ShareholderMeet (Number of the annual shareholder meetings); ShareType (0/1 Dummy if the cooperative among the shareholders has entities different from individuals); NumContracts (Number of outstanding contracts of the cooperative); Volunteer (Number of not occasional volunteers of the cooperative); NumShareholders (Number of shareholders with voting rights of the cooperative); Volunteer (Number of not occasional volunteers of the cooperative).
 Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1

group of survived older vintage social cooperatives is expected to be stronger in terms of outreach than the group of younger vintage social cooperatives on which time selection has more recently started to work.

The positive impact of managerial turnover on social cooperative efficiency documents a problem which is typical of small productive organizations for which a market for corporate control does not exist. The risk in these organizations is managerial entrenchment which may delay the process of managerial change and selection. Older management is also more likely to have accumulated over time power and privileges and more likely to waste corporate resources for their private interest. This is why rules for managerial turnover may have beneficial effects on efficiency and outreach. The positive contribution of non individual shareholder types (governmental entities, cooperatives, etc.) can be interpreted in the sense that stronger network ties help the social cooperative to improve its outreach. The positive impact of target programming on efficiency is also an important sign that adoption of these procedures important effects on social cooperative activity. Outreach is also negatively correlated to the number of shareholders meetings. This findings is highly likely to identify a trade-off between participation and productive efficiency which may be typical of multistakeholder organizations where participation is important but the division of power among stakeholder is not as clear as in the hierarchic structure of a profit maximizing company.

Note as well that our estimate shows that affiliation to consortia and federation is not significant per se. What is most likely is that second level organizations are only indirectly important when they contribute to promote the true determinants of outreach such as product/service and customer innovation, target programming and variety of shareholder types in the social cooperative.

Our empirical findings also document that local factors such as province (the Italian county administrative level) per capita GDP and human capital (share of adult people – above 25 – with a University degree) help cooperatives to reach a greater level of efficiency intended in the sense of outreach. The most likely interpretation for the impact of GDP is that in a richer area higher purchasing power and higher revenues from taxation translate into higher private and/or public demand for social services and/or that a richer area is as well provided with infrastructures which could enhance productivity of social enterprises.

The positive impact of human capital is also expected. Among the various effects of human capital in the economic literature we find not only micro and macroeconomic effects on creation of economic value (as evidenced by the conditional convergence growth literature and by the return to schooling literature with worldwide empirical evidence).²⁰ Human capital is also known to affect positively and significantly social capital (see among others Helliwell and Putnam 2007).

In a final robustness check we estimate the same model without the cooperatives belonging to first quintile (quintile calculated in terms of the number of shareholders as a measure of size) (Table 2b). We omit the first quintile since we want to check whether our findings are confirmed when we exclude from the sample the smallest cooperatives

20 For the return to schooling literature see among others Psacharopoulos (1994) and Benjabib and Spiegel (1994). For survey on the conditional convergence growth literature see, among others, Islam (2003).

Table 2b – Econometric estimation (no first quintile)

	Q1	Q2	Q3
<i>Part 1 – Estimation of production function (Translog)</i>			
Recreational	0.00000225 (0.0000696)	0.00000515 (0.0001048)	0.00000235 (0.000049)
Med	0.00000985 (0.000094)	0.0000152 (0.0001416)	0.0000114 (0.0000666)
SocInc	0.00000746 (0.0001321)	0.0000168 (0.0001943)	0.00000801 (0.0000922)
ListenGuid	0.00000776 (0.0001012)	0.0000181 (0.0001521)	0.00000541 (0.0000706)
Resident	0.0000172 (0.0000934)	0.0000285 (0.0001358)	0.0000164 (0.0000646)
Educ	0.1675362*** (0.0003296)	0.1727878*** (0.000565)	0.1729566*** (0.0003176)
RMT	0.8323792*** (0.000423)	0.827062*** (0.0006625)	0.8269642*** (0.0003638)
HCS	0.0000111 (0.0000744)	0.0000167 (0.0001129)	0.0000101 (0.000053)
Meal	0.0000197 (0.0001257)	0.0000362 (0.0001839)	0.0000163 (0.0000858)
Recreational*Recreational	0.000000311 (0.00000729)	0.00000033 (0.0000109)	0.000000277 (0.00000513)
Recreational*Med	0.000000245 (0.00000891)	0.000000202 (0.0000133)	0.000000152 (0.00000622)
Recreational*SocInc	-0.0000000198 (0.0000108)	-0.000000316 (0.0000163)	0.000000125 (0.00000763)
Recreational*ListenGuid	0.000000289 (0.00000781)	0.000000469 (0.0000119)	0.000000366 (0.00000556)
Recreational*Resident	0.000000299 (0.00000953)	0.000000281 (0.0000138)	0.00000037 (0.00000659)
Recreational*Educ	-0.0004142*** (0.0000764)	-0.0045161*** (0.0001656)	-0.0045401*** (0.0000773)
Recreational*RMT	0.0004125*** (0.0000803)	0.0045142*** (0.0001723)	0.0045385*** (0.0000807)
Recreational*HCS	0.000000148 (0.00000774)	0.000000152 (0.0000117)	-0.000000904 (0.00000546)
Recreational*Meal	-0.000000346 (0.0000108)	-0.000000561 (0.0000161)	-0.000000245 (0.00000756)
Med*Med	0.00000102 (0.00000984)	0.00000209 (0.0000149)	0.000000894 (0.000007)
Med*SocInc	0.000000438 (0.0000135)	0.00000114 (0.0000199)	0.000000276 (0.00000937)
Med*ListenGuid	0.000000482 (0.00000899)	0.000000305 (0.0000137)	0.000000297 (0.0000064)
Med*Resident	0.00000225 (0.0000111)	0.00000394 (0.0000158)	0.00000221 (0.00000762)
Med*Educ	0.0007742*** (0.0000451)	0.0040735*** (0.0000945)	0.0041011*** (0.0000494)
Med*RMT	-0.0007829*** (0.0000564)	-0.0040899*** (0.0000846)	-0.0041092*** (0.0000451)
Med*HCS	0.000000791 (0.00000859)	0.00000125 (0.0000131)	0.000000678 (0.00000615)
Med*Meal	0.0000018 (0.0000135)	0.00000361 (0.0000201)	0.00000186 (0.00000947)

Continued

Table 2b – Continued

	Q1	Q2	Q3
<i>Part 1 – Estimation of production function (Translog)</i>			
SocInc*SocInc	0.00000314 (0.0000159)	-0.00000811 (0.0000234)	0.00000226 (0.0000111)
SocInc*ListenGuid	0.000000121 (0.0000105)	0.00000057 (0.0000157)	0.000000826 (0.0000744)
SocInc*Resident	-0.000000975 (0.0000149)	-0.00000138 (0.000022)	-0.00000085 (0.0000104)
SocInc*Educ	0.0001265 (0.0000373)	0.00172 (0.0000862)	0.0017239 (0.0000403)
SocInc*RMT	-0.0001267 (0.0000502)	-0.0017185 (0.0000987)	-0.0017241 (0.0000465)
SocInc*HCS	-0.000000577 (0.0000133)	-0.00000587 (0.0000203)	0.00000018 (0.0000095)
SocInc*Meal	0.000000222 (0.0000161)	0.000000471 (0.0000248)	0.000000159 (0.0000113)
ListenGuid*ListenGuid	-0.000000635 (0.0000103)	-0.000000984 (0.0000159)	-0.000000625 (0.0000734)
ListenGuid*Resident	0.000000705 (0.0000112)	0.00000142 (0.0000167)	0.000000451 (0.00000783)
ListenGuid*Educ	0.0036363 (0.0000582)	0.0055405 (0.0000938)	0.0055444 (0.0000456)
ListenGuid*RMT	-0.0036369 (0.0000628)	-0.0055417 (0.0001011)	-0.0055447 (0.0000488)
ListenGuid*HCS	0.000000403 (0.00000957)	0.000000462 (0.0000146)	0.000000442 (0.00000683)
ListenGuid*Meal	0.000000315 (0.0000116)	0.000000595 (0.000018)	0.000000201 (0.00000833)
Resident*Resident	0.00000118 (0.00000975)	0.00000199 (0.0000139)	0.0000011 (0.00000661)
Resident*Educ	-0.0098111 (0.0000978)	-0.0052241 (0.0002236)	-0.0052012 (0.0001066)
Resident*RMT	0.0098023 (0.0001027)	0.0052095 (0.0002172)	0.0051927 (0.0001029)
Resident*HCS	0.000000152 (0.00000955)	-0.00000554 (0.000014)	0.000000253 (0.00000664)
Resident*Meal	0.00000193 (0.0000137)	0.00000372 (0.0000204)	0.0000019 (0.00000958)
Educ*Educ	-0.04403 (0.0000431)	-0.0432199 (0.0000735)	-0.043206 (0.0000351)
Educ*RMT	0.1102593 (0.000099)	0.11015 (0.0001413)	0.110125 (0.0000692)
Educ*HCS	-0.025314 (0.0000376)	-0.0261284 (0.0000575)	-0.0261081 (0.0000321)
Educ*Meal	0.0099825 (0.0001856)	-0.0004515 (0.0002895)	-0.0005195 (0.0001396)
RMT*RMT	-0.0662149 (0.0000299)	-0.0669091 (0.000037)	-0.066904 (0.0000175)
RMT*HCS	0.0253179 (0.0000446)	0.0261394 (0.0000673)	0.0261105 (0.0000361)
RMT*Meal	-0.0099884 (0.0001845)	0.0004419 (0.0003003)	0.0005128 (0.0001448)
HCS*HCS	-0.00000257 (0.0000104)	-0.00000507 (0.0000162)	-0.00000207 (0.00000755)

Continued

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Table 2b – Continued

	Q1	Q2	Q3
<i>Part 1 – Estimation of production function (Translog)</i>			
HCS*Meal	-0.00000569 (0.0000112)	-0.00000191 (0.0000173)	-0.000000258 (0.00000807)
Meal*Meal	0.00000032 (0.0000119)	0.000000283 (0.0000188)	0.000000558 (0.00000875)
Labour	-0.0000236 (0.0001563)	-0.0000407 (0.0002259)	-0.0000232 (0.0001082)
TotAss	-0.00000109 (0.0000411)	-0.00000282 (0.0000619)	-0.000000841 (0.0000288)
Labour*Labour	0.00000745 (0.0000325)	0.0000129 (0.0000448)	0.00000694 (0.0000219)
Labour*TotAss	0.000000727 (0.000014)	0.000000404 (0.0000207)	0.000000929 (0.0000097)
TotAss*TotAss	0.000000635 (0.00000247)	0.000000277 (0.00000378)	0.0000000247 (0.00000174)
Labour*Recreational	-0.00000109 (0.0000183)	-0.00000217 (0.0000269)	-0.000000674 (0.0000127)
Labour*Med	-0.0000056 (0.0000248)	-0.00000982 (0.0000352)	-0.00000565 (0.0000171)
Labour*SocInc	0.00000107 (0.0000319)	0.00000208 (0.0000465)	0.000000651 (0.0000223)
Labour*ListenGuid	-0.00000117 (0.0000249)	-0.00000109 (0.0000366)	-0.00000135 (0.0000173)
Labour*Resident	-0.00000726 (0.0000273)	-0.0000116 (0.000037)	-0.00000726 (0.0000183)
Labour*Educ	0.0110003 (0.0001062)	0.0058186 (0.0002101)	0.00577 (0.0001042)
Labour*RMT	-0.0109749 (0.0001232)	-0.0057789 (0.000192)	-0.0057437 (0.0000938)
Labour*HCS	0.000000299 (0.0000211)	0.00000138 (0.000031)	0.000000484 (0.0000147)
Labour*Meal	-0.00000695 (0.000036)	-0.0000117 (0.000051)	-0.00000774 (0.0000249)
TotAss*Recreational	-0.000000242 (0.0000055)	-0.000000278 (0.00000828)	-0.000000334 (0.00000386)
TotAss*Med	-0.000000434 (0.00000888)	-0.000000643 (0.0000134)	-0.000000431 (0.00000628)
TotAss*SocInc	-0.000000997 (0.0000119)	-0.00000161 (0.0000175)	-0.000000908 (0.00000827)
TotAss*ListenGuid	-0.000000296 (0.00000942)	-0.00000119 (0.0000143)	0.00000000101 (0.00000657)
TotAss*Resident	-0.000000358 (0.00000819)	-0.000000538 (0.0000122)	-0.00000026 (0.00000571)
TotAss*Educ	0.0108472 (0.0000401)	0.0117579 (0.0000774)	0.0117546 (0.0000362)
TotAss*RMT	-0.0108443 (0.0000388)	-0.0117533 (0.0000756)	-0.0117522 (0.0000354)
TotAss*HCS	0.000000267 (0.00000673)	0.000000628 (0.0000102)	-0.000000252 (0.00000477)
TotAss*Meal	-0.000000464 (0.0000114)	-0.000000794 (0.0000164)	-0.000000117 (0.00000767)
Cons	0.0005268 (0.0002978)	0.0012508 (0.0004386)	0.0005242 (0.0002069)

Continued

Table 2b – Continued

	Q1	Q2	Q3
<i>Part 2 – Estimation of inefficiency model</i>			
NorthEast	2.601***	2.634***	2.687***
	-0.648	-0.64	-0.696
Centre	3.578***	4.602***	4.65***
	-0.715	-0.75	-0.81
South	-3.515**	-2.087	-2.118
	-1.193	-1.184	-1.275
Isles	-15.049***	-12.561***	-12.882***
	-1.711	-1.664	-1.758
ProvinceGDPpro	-18.443***	-16.018***	-16.463***
	-2.088	-2.028	-2.17
RegGradeShare	-0.677***	-0.677***	-0.69***
	-0.091	-0.094	-0.1
Fed	-0.985*	-1.207**	-1.338***
	-0.442	-0.447	-0.491
Consortia	0.565	0.483	0.616
	-0.409	-0.425	-0.465
Age	-0.906***	-1.184***	-1.205***
	-0.267	-0.264	-0.289
ProductInn	-2.751***	-2.915***	-3.074***
	-0.601	-0.61	-0.652
CustInn	-2.273***	-2.14***	-2.147***
	-0.528	-0.537	-0.578
Monit	1.639***	1.511**	1.608**
	-0.451	-0.46	-0.502
FinSource	-0.804	-0.473	-0.416
	-0.51	-0.507	-0.557
ProgEc	-2.326***	-2.663***	-2.748***
	-0.516	-0.508	-0.559
ManagerShare	0.887	2.969**	2.708*
	-1.085	-1.062	-1.194
TurnOverManager	-0.562	-0.476	-0.517
	-0.419	-0.412	-0.455
ShareholderMeet	2.278***	2.042***	2.004***
	-0.489	-0.487	-0.534
ShareType	-4.392***	-4.188***	-4.158***
	-0.812	-0.779	-0.818
NumContracts	2.156***	2.295***	2.158***
	-0.256	-0.26	-0.238
Volunteer	0.006	-0.201	
	-0.226	-0.223	
NumShareholders		1.397***	1.348***
		-0.219	-0.234
Cons	-56.048	-49.209	-51.805
	-7.745	-7.603	-8.258
σ_u	0.810***	0.818***	0.83***
	(0.024)	(0.025)	(0.026)
σ_v	0.001***	0.001***	0.001***
	(0.0001)	(0.0001)	(0.0001)

Continued

Table 2b – Continued

	Q1	Q2	Q3
	<i>Part 2 – Estimation of inefficiency model</i>		
λ	4406.8*** (0.024)	1511.3*** (0.025)	3888.4*** (0.026)
Predicted u	0.057	0.058	0.057
N. Obs.	2404	2404	2404
Log L.	4783.171	4747.01	4798.165
AIC	-9364.34	-9290.02	-9394.33
BIC	-8780.07	-8699.96	-8810.06

Q1 model with volunteers, Q2 model with volunteers and shareholders, Q3 model with shareholders.

$\lambda = \frac{\sigma_u}{\sigma_v}$, *Tech. efficiency* = e^{-u} (if 0 complete inefficiency, if 1 perfect efficiency).

Educ (Teaching services); RMT (Rescue and Medical transport services); HCS (Home care services); Meal (Catering services); Recreational (Recreational services); SEA (School educational assistance services for disabled); Med (Medical services); SocInc (Services for social inclusion); ListenGuid (Listening and guidance services); Resident (Residential services); Labour (Number of workers of cooperatives); TotAss (Value of assets of cooperatives – net of amortization and depreciation); Area (Dummy depending on location of cooperative in Italy – North West, North East, Centre, South and Isles); ProvinceGDPpro (Province's Gross Domestic Product pro-capita); Reg-GradeShare (Region's share of inhabitants with a university degree); Fed (0/1 Dummy if the cooperative belongs to a federation of cooperatives); Consortia (0/1 Dummy if the cooperative belongs to a consortium); Age (Years of activity of the cooperative); ProductInn (0/1 Dummy if the cooperative made in the last two years product/services innovation); CustInn (0/1 Dummy if the social cooperative identified in the last two years new segments of customers); Monit (0/1 Dummy if the social cooperative developed auditing activities in the last two years); FinSource (0/1 Dummy if the main source of revenues of cooperative comes from public sector); ProgEc (0/1 Dummy if the cooperative made in the last two years target programming activities); ManagerShare (Share of managers in the cooperative workforce); TurnOverManager (0/1 Dummy if the cooperative realized a partial or total turnover of the managers in the last two years); ShareholderMeet (Number of the annual shareholder meetings); ShareType (0/1 Dummy if the cooperative among the shareholders has entities different from individuals); NumContracts (Number of outstanding contracts of the cooperative); Volunteer (Number of not occasional volunteers of the cooperative); NumShareholders (Number of shareholders with voting rights of the cooperative).

Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1

which are more likely to operate in a way similar to volunteer associations. In this respect we aim to control if our results are robust even in absence of the smallest cooperatives. The three estimates (full model, full model without volunteers and full model without shareholders) show that our main findings are confirmed with a few exceptions. Volunteers are no more negative and significant when we omit the smallest organizations from the sample while and the number of shareholders increases inefficiency (so size matters). A likely rationale for the first finding is that volunteers activity does not harm productivity when framed in larger organizations where a sufficient backbone of paid workers exists.

5 Conclusions

The contribution of not for profit organizations to social cohesion, employment and reduction of inequalities is getting increasing recognition by public authorities and the general public. The EU has recently acknowledged it by launching the Social Business Initiative which aims at maximizing the impact of these organizations on the pursuit of socially and environmentally sustainable development.

In this framework more research on the determinants of properly defined and measured efficiency of these organizations is urgently needed. We provide a contribution in this direction by analyzing the determinants of productive efficiency of a large sample of social cooperatives in Italy.

In line with the literature we define productive efficiency of social cooperatives in terms of outreach efficiency, that is, the number of beneficiaries served for a given level of labour and capital inputs. We further take into account the heterogeneity of these organizations operating in different sectors with a multi-output stochastic distance function frontier approach. We are fully aware that our measure of social cooperative 'performance' may only imperfectly capture the multi-faceted and complex concept of quality and performance of social cooperative activity. We however deem important to shed some light also with quantitative analysis on an important aspect of their action represented by the ratio between inputs and customers served. In this sense our research (the first with this focus) may help social cooperatives to learn about factors regulating their capacity of reaching beneficiaries for a given level of used inputs.

Our findings document the significant role of the following factors at social cooperative level: i) product/service innovation; ii) identification of new customer segments; iii) firm age; iv) existence of a programming strategy; v) shareholders variety; vi) managerial turnover; vii) number of business contracts (negative); viii) number of shareholder meetings (negative); ix) number of volunteers (negative). We further document that per capita GDP and human capital significantly and positively affect social cooperative outreach.

When looking at cooperative level variables which significantly affect outreach we conclude that identification of new types of products/services/customers is crucial for the success of social cooperatives in times of economic difficulties and shrinking government budgets. Managerial turnover rules and target programming are two other important features of organizational quality positively and significantly correlated with outreach which proved to help social cooperatives to overcome successfully this difficult period. The negative impact of the number of contracts on outreach is likely to reveal diseconomies of scale but also likely to be affected by the minimum price rules of public procurement. In this sense we believe that the application of green and social procurement rules and introduction of minimal environmental and social criteria (in accordance with key action 10 of the EU Social Business Initiative) may contribute to achieve a better balance between price and quality, thereby helping to reduce the negative impact of public procurement on social cooperative outreach. We finally interpret our empirical findings on local determinants of outreach by arguing that the role of per capita GDP and human capital documents that social cooperatives are more efficient when located in a more favorable economic environment.

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