The role of members' commitment on agri-food co-operatives' capitalization, innovation and performance

RESEARCH ARTICLE

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Abstract

Undercapitalization has been recognized as a problem affecting Italian co-operatives to perform in modern agri-food markets. An empirical study on 50 Italian agri-food co-operatives was carried out to investigate co-operatives members' commitment capability to impact on the level of capitalization. The level of capitalization was also investigated as a mean to influence co-operatives' innovation and subsequently their performance. The results show how co-operatives with more committed memberships display higher levels of capitalization and that capitalization positively relates with innovation levels. The latter is also confirmed to enhance co-operatives' performance. These results are relevant from a managerial point of view as they reveal the importance of members' commitment in this particular type of organizations and provide new insights to improve co-operatives' innovation and performance.

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1. Introduction

According to the report of World Cooperative Monitor (2015), at world level the co-operative movement is particularly active within the agri-food sector. This is also confirmed at Italian level where, according to the last data provided by the national report on agri-food co-operatives by Osservatorio della Cooperazione Agricola Italiana (Di Tullio and Gandini, 2015), co-operatives play a key role both in relation to the national co-operation system and to the agricultural production. Considering the latest available data (Di Tullio and Gandini, 2015), in 2013 Italy accounted 9,795 agri-food co-operatives, about 13% of total agri-food enterprises, they involve 37% of the total agricultural gross sealable production and 25% of national income from agri-food sector. Still, according to the report, Italian co-operation is one of the most advanced at European level, considering that, among co-operatives, 79.5% of production input is provided by their members. The Italian co-operative movement is also particularly active in terms of exportations, by contributing at 13% of total national exports. Focusing on their geographical distribution, the highest concentration of co-operatives is located in the south of Italy, by involving the highest number of agricultural co-operatives, followed by those located in the north. However, co-operatives are quite fragmented in relation to the capability of generating income, as only 13% of them are able to address 87% of the total income generated by all co-operatives in Italy, still they are mainly concentrated in the northern areas (82% of total income has been generated in the north). This distribution is similar also considering the number of employed persons (Di Tullio and Gandini, 2015).

Despite the relevant role played, co-operatives have been showing a decreasing trend, due both to changes in the firm structure and the economic crisis. Excessive leverage is one of the most important problems agricultural co-operatives face (Russo *et al.,* 2000). The undercapitalization of co-operatives in Italy has been hypothesized by many Italian authors (Bono, 2011, 2012; Iannello, 1994; Mazzoli and Rocchi, 1996; Russo *et al.,* 2000). Fiorentini (1995) compared the capital structure of a sample of Italian agricultural co-operatives with a sample of investor owned firms and found that co-operatives were undercapitalized. The performance of the leverage ratio is heterogeneous and therefore difficult to interpret. In some cases, its growth seems to indicate a conscious choice by the co-operative to take on more debt in order to take advantage of a higher profitability that is superior to the cost of the debt. However, the same indicator may also be influenced heavily by the low level of capitalization of many Italian co-operatives (Bono, 2011).

The co-operative formula, compared with investor owned firms, has been assumed to be a model with difficulties in gathering the needed financial resources and therefore less innovative (Bono, 2012; Harte, 1997; James and Sykuta, 2005). As a result, co-operatives insufficiently capitalized might risk not to be able to remain a viable organizational form (Chaddad *et al*., 2005; Cook, 1995; Vitaliano, 1983).

Nonetheless, many co-operative firms survive and, in many cases, show high performances (Feng and Hendrikse, 2012). There is a wide consensus that members' commitment is one major prerequisite for co-operative's success (Fulton, 1999; Österberg and Nilsson, 2009; Zeuli and Betancor, 2005). In order to acquire the required capital to implement growth-related strategies and remain competitive, agricultural co-operatives need to encourage their members to participate on equity raisings. To this extent, the study provided by Euricse (Prandi, 2014), focusing on a sample of 4,451 Italian co-operatives operating in different sectors between, emphasizes that a minority of co-operatives (9.1%) has been able to reach an adequate capitalization with strong members' participation. In addition they recorded optimal performances of growth of the share capital and showed a greater use of social equipment to strengthen the self-financing and the link between members and the co-operative. In this sense, also the use of the instrument of social lending has increased with a positive relation to the increasing size of the co-operative and to the higher level of capitalization. In fact, the instrument of loan capital was used not only out of necessity (self) funding, but probably as a fiduciary service social co-operative, intended also in terms of remuneration, deemed safe and convenient, the savings of the shareholder. The study confirms this approach also for the recent crisis' years (2008-2011), as these co-operatives have been able to guarantee the enhancement of members through the

compliance with the requirement of mutualistic prevalence, the effective participation of the members to the co-operative life (e.g. assemblies) and their engagement in growth capital.

Given the framework provided, the present study aims at shedding light on co-operatives' financial constraint hypotheses. In particular, at first, it aims at investigating to what extent capitalization might be influenced by members' commitment and whether this is a relevant aspect for the success of this kind of organization as stated by several authors (Fulton, 1999; Österberg and Nilsson, 2009). At second, the study aims at highlighting the possible effects of capitalization in relation to the acquisition of sufficient risk capital to finance profitable investment opportunities and to improve their performance (Bono, 2011, 2012; Iannello, 1994; Mazzoli and Rocchi, 1996; Russo *et al.,* 2000).

2. Theoretical framework

2.1 Members' commitment

Investor owned firms raise capital in order to achieve financial return for their investors. They benefits proportionally to their capital share in terms of income from dividends and the increased market value of the shares (Mills and Davies, 2013). Instead, co-operative capital is different owing to equally distributed profits according to patronage, the restrictions on transferability of shares and the lack of liquidity through a secondary market for the transfer of such shares (Cook, 1995). Hence, when compared with investor owned firms, co-operative capital does not offer to investors comparable economic benefits. Nevertheless co-operatives members do not only seek for profit, but other relational aspects.

The term of social capital has been used to address such features of a relationship as trust, norms and networks. This concept characterizes the quality of relationships and can help to improve the effectiveness of economic relationships (Spear, 2000).

In the context of co-operatives, it is possible to consider the co-operative values and principles as such social capital. This social capital is shared among members, replacing others incentives such as price, or the formal authority. Hence, this social capital constitutes the unifying force of this organizational form (Valentinov, 2007).

One of the key features of co-operatives which favors the creation and utilization of social capital is members' commitment. This commitment has been recognized as the differential factor from the investor owned firms (Spear, 2000). Without members' commitment co-operatives would have problems to operate and even to establish (Fulton, 1999). Fulton (1999) argued that commitment is a key aspect that make farmers choosing this model even if they could obtain higher prices from an investor owned firm. This reasoning leads to think that members' commitment is driving their willingness to invest and therefore the capitalization of the co-operative.

Hypothesis 1: Members' commitment has a positive influence in co-operative's capitalization.

2.2 Effects of capitalization on innovation

Investments in R&D in Italian co-operatives are usually a less relevant part of the strategies adopted by agri-food co-operatives (Bono, 2012). Agri-food marketing co-operatives have to compete with other forms of organization in a market characterized by a concentrated and powerful demand, overproduction in many produces and changing consumers' demands on products (Bijman and Hendrikse, 2003; Hernández-Espallardo *et al*., 2013). These challenges force co-operatives to adopt strategies of adaptation (Bijman and Ruben, 2005). Adaptation and innovation have become critical elements of business conduct affecting the competitiveness of the co-operatives (Gianakas and Fulton, 2005). In general, within the agri-food industry, the processes of innovation are primarily of an incremental nature and they do not have their main source of

investment in R&D as much as in formal and informal economic learning (Christensen, 1996; Galizzi and Venturini, 1996). Competitive strategies pursued by agricultural co-operatives in response to environmental and structural changes in the food system include value-added processing, brand name development, and entry into international markets. All of them require substantial investments (Chaddad and Cook, 2004).

Hypothesis 2: Co-operative's capitalization has a positive effect on its innovation.

2.3 Effects of innovation on performance

Roberts and Amit (2003) describe the importance of innovation as a leading asset to reach a competitive advantage and superior profitability. As revealed in many studies, innovation and firm performance have a positive relationship (Calantone *et al.,* 1995, Capon *et al.,* 1990; Han *et al.,* 1998; Zahra and Das, 1993). Innovation would appear in product, process, market, factor and organization (Kao, 1989), but the first three dimensions are more familiar in the innovation literature (Johne and Davies, 2000; Najib and Kiminabi, 2011; Otero-Neira *et al.,* 2009; Rosli and Sidek, 2013). Many economists have accepted innovation as a key condition for business performance, competitiveness, and economic wealth (Caird, 1994). A study by Deshpande *et al.* (1993) indicated that innovativeness is positively related to organizational performance in terms of relative profitability, market share, and growth. Baldwin and Johnson (1996) showed the significant impact of innovation on a wide variety of business performance measures, including market share and return on investment. Further, Salavou (2002) also found that product innovation was a significant determinant of business performance based on return on assets.

Hypothesis 3: Co-operative's innovation has a positive impact on performance.

3. Materials and methods

3.1 Data collection

According to Osservatorio della Cooperazione Agricola Italiana (Di Tullio and Gandini, 2015) and Bertagnoni (2015), Emilia Romagna is the leader region of the co-operative movement in Italy, including 701 agri-food co-operatives, representing 14% of the national amount of co-operatives, and producing an overall income of over 13 billion euro, corresponding to one third of the total income generated at national level by the co-operative agri-food sector in 2013. In details, about 7% (51) of co-operatives in Emilia Romagna reached an income over 40M euro; 14% (101) performed between 7M and 40M euro; 29% (200) between 2M and 7M euro; and 60% (349) below 2M euro. The main important sectors refer to meat, horticulture and wine productions. The questionnaire targeted managers of co-operatives located in Emilia Romagna region. The co-operatives involved in the study belong to two out of 4 national associations of co-operatives that are Legacoop and Confcooperative. The list of co-operatives contacted included small medium and large firms, and every typology of agri-food sector.

Online questionnaire were submitted between July and October 2015. Out of 100 questionnaires, 58 questionnaires were successfully completed, although only 52 were the valid ones.

3.2 Questionnaire design

The instrument used was a questionnaire created *ad hoc*. The measurement scales are based on the literature and were adapted when necessary with the feedback from prior interviews and pre-tests.

■ *Capitalization*

About capitalization, considering the peculiar structure and mission of co-operatives organizations, the scale was developed according to the available literature investigating capitalization needs for co-operatives (Fiorentini, 1995; Iannello, 1994; Mazzoli and Rocchi, 1996; Russo *et al.* 2000). The pre-tests feedbacks were relevant to refine the aspects that mainly involve agri-food co-operatives. The items referred to the availability of capital resources, the difficulties to access external funds, and the difficulties to fund new investment projects, with particular regard at the needed support of ancillary services undertakings.

■ *Innovation*

The innovation inventory of Oslo Manual of OECD/Eurostat (2005) was adopted to include the most common innovation aspects regarding agri-food co-operatives, following they were validated through pre-tests' feedbacks.

■ *Performance*

As performance, there were considered those outcomes that show the fulfilment of the organizations goals (Kumar *et al.*, 1992). Thus, Quinn and Rorbaugh (1993) proposal were adopted to define its measurement. They used four models that simultaneously describe the organization performance. That is, the human relations model regarding the development and satisfaction of the participants, the internal process model referring to the development of the activities and operational processes, the open system model in regard to the adaptation to the market, and the rational goal model that refers to achievement of productivity and efficiency goals. To this extent these models were adapted to the co-operatives' scenario following the pre-tests feedbacks to validate the items. The assessment of the measurement model let with only three items of the models. The item regarding to the human relations did not showed to be statistically significant on this scale. Nevertheless, the item of the rational goal model is represented as the achievement of better prices for farmers and it can also act as a proxy variable of the human relations model as the prices have been proven to be a good predictor of the farmers' satisfaction (Hernández-Espallardo *et al.*, 2013).

■ *Commitment*

Members' commitment was measured with the scale developed by Gundlach *et al*. (1995) and Kumar *et al*. (1995). This concept consider members' willingness to make short-term efforts (Gundlach *et al*., 1995) and investments (Kumar *et al*., 1995).

■ *Control variables*

Control variables contributed to assess the validity of the model, as with them, the core effect of concepts is better isolated. Two variables were included in the analyses: co-operative's self-declared turnover and number of members.

■ *Validity tests*

The scales used in the measurement model are made from formative indicators. In this type of scales, each item, referring to the different dimensions of the concepts, contributes or adds to the latent construct (Fornell and Larcker, 1981). According to the methodology described by Rossiter (2002) for formative scales, the most relevant components of each of the concepts supported by literature were included, in addition to the comments and feedback from the prior interviews and pre-tests. For a proper model specification with partial least squares (PLS) methodology, these formative constructs should address at least major part of their domains (Hair *et al.*, 2012).

In order to evaluate the measurement model, it was needed to test the validity of the scales used. To assess the validity of the formative constructs, it was used the weight of each indicator for each latent construct according to criteria of significance regardless of size, as formative items are viewed as multidimensional and not similar measures reflecting the same underlying construct (Chin, 1998; Vinci *et al.,* 2010).

The estimation of this validity was performed with the PLS approach with the bootstrapping technique, which calculates the weights of the items on the construct and their significance. At this regard, several items of some scales were removed because their weights were not statistically significant. The validity of the scales was confirmed as the weights of the items were sufficiently significant (Table 1). Despite the use of weights to assess constructs' validity, as Marcoulides *et al.* (2009: 173) pointed, the 'latent' PLS constructs are not really latent variables since they are not explained by their covariations, just approximately'. In PLS sums of the indicators are not weighted, they can only be estimated by weighted sums of their indicators, being loading vector proportional to the weight vector (Scheeweiss, 1993). However, this aspect was not a critical issue to the model application since in this investigation there were used formative constructs.

3.3 Data analysis

To test the hypotheses, the structural equation modelling was used. The analyses were conducted following the PLS methodology, which is especially useful to test theories when formative measures, non-normal data[1], many latent variables and limited sample size are involved (Chin, 1998; Henseler *et al*., 2009). Both measurement and structural models were estimated with SmartPLS 2.0 M3 software[2] (Ringle *et al*., 2005).

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[1] None of the variables shows a normal distribution in Kolmogorv-Smirnov normality test.

[2] Settings. PLS algorithm: no missing value algorithm, path weighting scheme, 500 max. iterations, 1.0E-5 abort criterion; bootstrapping algorithm: no sign changes, 52 cases, 3,000 samples.

Table 1. Weights and *t*-values.[1]

Construct	Item	Weights	*t*-value
Capitalization	CAP1	0.24	2.35
	CAP3	0.39	6.36
	CAP4	0.25	2.40
	CAP5	0.44	4.83
Innovation	INN2	0.24	3.61
	INN3	0.11	1.81
	INN4	0.18	3.32
	INN5	0.24	5.11
	INN7	0.16	3.17
	INN8	0.18	3.79
	INN9	0.20	3.58
	INN10	0.15	2.92
Performance	PER2	0.24	1.84
	PER3	0.44	5.22
	PER4	0.44	3.59
Commitment	COMM2	0.32	2.57
	COMM5	0.34	2.51
	COMM6	0.31	1.86
	COMM8	0.42	3.79

[1] Probability of critical *t*-values: *P*<0.10 for *t*>1.65; *P*<0.05 for *t*>1.96 and *P*<0.01 for *t*>2.58.

4. Results

To assess the structural model by PLS, the variance of the dependent latent variables explained by the independent variables that predict them (R^2) must be considered and, in particular, the significance of the coefficients associated with the proposed relationships must be assessed (Cepeda and Roldán, 2008).

In this case, the dependent variables are performance, innovation and capitalization. The value of R^2 expresses the proportion of variance of the dependent variable that is explained by the independent variable, so the closer it is to one, the more explanatory power the model will have, always bearing in mind that R^2 must not be less than 0.1 (Falk and Miller, 1992).

The model had sufficient predictive power to explain the variable performance ($R^2=0.20$) innovation ($R^2=0.27$) and capitalization ($R^2=0.19$) as they are above 0.1 (Falk and Miller, 1992).

As a complement when analyzing the size of R^2 as a criterion of predictive significance, the technique of reusing the sample proposed by Stone (1974) and Geisser (1975) can be applied through the blindfolding process. This technique consists of omitting part of the data when estimating a dependent variable from other independent variables, and then attempts to estimate those data by using previously estimated parameters. This process is repeated until each datum has been omitted and estimated. This technique calculates construct cross-validated redundancy index Q^2 that represents a measure of how well the observed values are reconstructed from the estimated parameters. Hair *et al.* (2012) recommends assessing cross-validated redundancy besides the effect sizes. For the model to have predictive validity, Q^2 must be greater than zero. The model shows an adequate predictive capacity, as three dependent variables, namely performance ($Q^2=0.15$), innovation ($Q^2=0.12$) and capitalization ($Q^2=0.10$), Q^2 is greater than zero (Geisser, 1975).

After analyzing these statistics, it was conducted the structural model test. The analysis generated the estimates of the standardized coefficients for the proposed relations and their t-values obtained through bootstrapping process (Table 2) (Chin, 1998).

In relation to the theoretical model applied, all estimations have shown significant coefficients as predicted, confirming the predicted relations (Figure 1). In fact, the results show a positive relation between capitalization measures and innovation in the co-operative as predicted in H1. Likewise members' commitment show to have a positive influence in co-operative's capitalization measures (H2). And finally, as stated in H3, co-operative's innovation measures are positively related with its performance.

As for the control variables, all of them had non-significant influence on dependent variables, except the relation of co-operative's turnover with innovation, which shows a positive effect.

Table 2. Standardized coefficients (β) and *t*-values.

Hypotheses	β	*t*-value[1]
H1: Capitalization → Innovation	0.46	3.91***
H2: Innovation → Performance	0.42	2.89***
H3: Commitment → Capitalization	0.44	3.87***

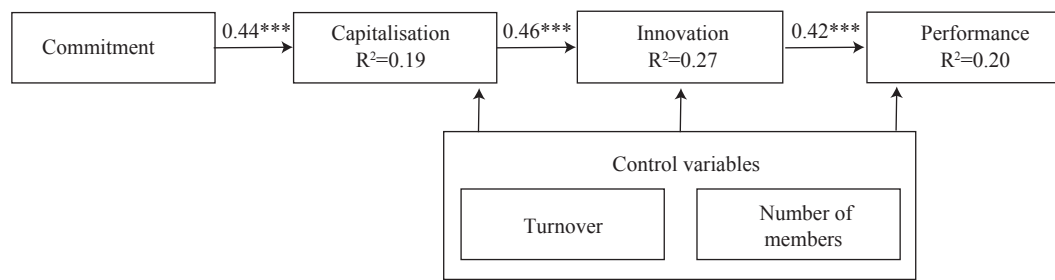[1] *** = $P<0.01$.

Figure 1. Theoretical model and results (standardized path coefficients and R^2).[*] $= P<0.10$; [**] $= P<0.05$; [***] $= P<0.01$; n.s. $=$ non-significant.

5. Conclusions

The aim of the study was to assess the role of capitalization of the co-operatives on their innovation and performance since they are theorized and probed to be an undercapitalized formula (Prandi, 2014; Russo *et al.,* 2000).

Therefore at first, it was verified whether members' commitment has a positive influence on co-operatives' capitalization as it has been theorized to be the factor that lead co-operatives to remain competitive in relation with investor owned firms (Österberg and Nilsson, 2009). The results of the analyses confirm the hypothesis that members' commitment is positively related with co-operative levels of capitalization. Members' commitment is the reflection of the co-operatives' values and principles (Spear, 2000) and they are the main capital suppliers (Mills and Davies, 2013; Nilsson *et al*., 2012), hence this leads to think that trust and relational norms can be drivers of co-operatives' investments. As commented by Chaddad *et al*. (2005), it has been suggested that financial constraints are the weaknesses of co-operatives in an increasingly concentrated, tightly coordinated and capital-intensive food system (Cook, 1995; Vitaliano, 1983). Furthermore, risk capital acquisition in the traditional co-operative firm is limited by number, wealth, and risk-bearing capacity of its current members (Chaddad *et al*., 2005). Thus, in order to acquire the required capital to implement these growth-related strategies and remain competitive, agricultural co-operatives need to encourage their members to participate on equity raisings.

Results also confirm the second hypothesis about the positive effect of the capitalization level on co-operatives' innovation. In fact, more capitalized co-operatives are more prone to carry out innovative projects. Capitalized co-operative can be able to provide the sufficient capital to invest and/or to achieve adequate standards to access to financial markets so as to fund innovation. As confirmed by the evidence and the literature, own members' capital input is considered a precondition for financing entities to approve loans and support risky financial decision. Similarly, some authors stated that highly committed memberships are more able to engage differentiated product development (Fulton, 1999) and also demonstrated that suppliers' (i.e. members in this case) trust and commitment determines their involvement in customers' (i.e. co-operatives) new product development (Walter, 2003).

With regards to the third hypothesis, referring to the innovation effect on co-operatives' performance, it has been also confirmed that investing on innovation induces better performances. This inquiry is in line with those on literature (Calantone *et al.,* 1995; Capon *et al.,* 1990; Han *et al.* 1998; Zahra and Das, 1993). In addition, the results would apply to a market oriented perspective to the extent that innovation is considered a key driver to match customers' preferences and to adapt to the market needs, by reflecting on improved performances (Costa and Jongen, 2006; Hult *et al.,* 2005).

6. Managerial implications

From a managerial point of view, these findings highlight that it is essential to create the conditions to improve co-operatives members' commitment since this is a mean to increase capitalization. To this extent, co-operatives shall favor communication and information sharing among their members, to enhance members' participation in the co-operative (Barraud-Didier *et al*., 2012). In fact, the literature points out that information-sharing is a lead agent to improve commitment and motivation (Guerrero and Barraud-Didier, 2004). Thus, the co-operative must not forget to focus and invest on its social relationships with members on account to achieve good capitalization levels through a better members' commitment.

Furthermore, the interest of the study is undoubtedly relevant to explain capitalization in relation to competitiveness related variables (innovation and performance). As for innovation, the results point out that it is related with the level of capitalization. This effect can overcome the natural tendency of agri-food co-operatives to act with a short-term view mainly focused towards farmers' needs rather than the co-operative as a firm, driven by market and innovation views (Baamonde, 2009; Kyriakopoulos *et al*., 2004). The findings also backed up the idea that those co-operatives that leads more innovative actions are those which show better performance. In fact, they perform better to develop the activities and operational processes, to adapt to the market, and to achieve productivity and efficiency goals.

These implications might be also of interest to develop policy recommendations to improve the general competitiveness of the co-operative formula and its maintenance in the long run, with positive implications on rural areas.

7. Limits of the study and further research

Given these insights, it shall be underlined that the study focused only on a limited sample, with a circumscribed geographical extent. Additionally, it is limited to one sector and type of organizations that are agri-food co-operatives. These aspects make findings not able to be ascribed to this context and generalizations might be taken with caution. Future research could aim at testing the hypotheses adopted within a bigger sample.

In addition, another limitation comes from the measurement method as it is based on respondent's subjective perceptions. The use of this type of measures is common in the literature, although triangulation with archival or secondary data would be advisable in further researches.

Future research should focus on confirming the hypothesis adopted on the influence of commitment on capitalization through other empirical methods as panel groups technique or dyad data from farmers and managers, helping to reinforce and validate the theoretical model. Besides, they could address the testing of this model on investor owned firms in order to find out how, in a value chain perspective, suppliers' commitment might affect similarly.

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