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## Group heterogeneity and cooperation on the geographical indication regulation: The case of the “Prosciutto di Parma” Consortium

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### ABSTRACT

This paper explores the impact of individual group members' heterogeneous characteristics, resources and strategies on their level of cooperation on defining the future regulation of Geographical Indications (GIs). By following a “grounded theory” approach, this study combines qualitative evidence from an in-depth study on the “Prosciutto di Parma” Protected Designation of Origin (PDO) Consortium with quantitative evidence based on data collected from 94 Consortium members and analysed through path modelling. Results confirm that (1) “Prosciutto di Parma” Consortium members have highly and increasingly heterogeneous characteristics, assets and strategies and that (2) higher heterogeneity negatively affects members' agreement on the future level of restrictiveness of “Prosciutto di Parma” PDO as GI and therefore the effectiveness of the collective action. Overall, these findings give light to another internal barrier that may threaten producers' opportunity of profiting from the use of established and highly recognized GIs. Managerial and policy implications for both “Prosciutto di Parma” Consortium members and other groups governing established and highly recognized GIs are drawn.

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### Introduction

Although they have a long history, Geographical Indications (GIs) increased exponentially in the global agri-food marketplace in the latest 25 years (Escudero, 2001; Profeta et al., 2010; Rangnekar, 2004; Raustiala and Munzer, 2007). Producers' groups establishing, regulating and governing the use of these GIs are organized in a large variety of forms. In Europe, GIs such as Protected Designations of Origin (PDO) and Protected Geographical Indications (PGIs), as well as their supporting producers' groups, are regulated and governed under a common EU policy framework (Babcock and Clemens, 2004; Bureau and Valceschini, 2003; Goldberg, 2001) and by the European law (Marette et al., 2008; Rangnekar, 2004). In the rest of the world, GIs are generally regulated and governed privately by producer associations, local public institutions or through a combination of public-private roles within the frameworks of national legislations (Carter et al., 2006; Faulhaber, 2005; Giovannucci et al., 2009; Josling, 2006; Raynaud et al., 2005).

Research has recently established the conditions under which GIs represent a profitable market opportunity for agri-food producers, including consumers' characteristics (Bonnet and Simioni, 2001; Loureiro and McCluskey, 2000; Van Ittersum et al., 2007;

Bernabéu et al., 2010; Teuber, 2011), attitudes, values and goals (Roosen et al., 2003; Grebitus et al., 2011) as well as the products' nature and place of origin (Acampora and Fonte, 2007; Hassan and Monier-Dilhan, 2005; Scarpa et al., 2005; Stefani et al., 2005; Wirthgen, 2005). GIs may have a direct impact on the products' utility, because of its symbolic and affective role (Teuber, 2011), as well as being used as a quality cue for sensory characteristics (Stefani et al., 2005; Grebitus et al., 2011). Moreover, researchers analysed worldwide when and how a group of producers can develop a common set of rules to jointly exploit market opportunities through GIs (Bureau and Valceschini, 2003; Giovannucci et al., 2009; Marette et al., 1999; Marette and Crespi, 2003; Raynaud et al., 2005). Finally, a number of studies have highlighted the producer groups' internal or external barriers to exploit market opportunities through the introduction and regulation of GIs. Often cited external barriers are the lack of international reputation among consumers (Bureau and Valceschini, 2003), the increasing competition among GIs and other labels signalling other intangible attributes, the infringement of geographical name property rights (Barjolle and Sylvander, 2002; Ilbert and Petit, 2009; Parrott et al., 2002; Rangnekar and Kumar, 2010; Snyder, 2008) and the rising competition of individual brands (Bureau and Valceschini, 2003; Raynaud et al., 2005; Bouamra-Mechemache and Chaaban, 2010). Internal barriers mainly refer to the risk of moral hazard of selling products below the jointly established quality standard and the relative coordination mechanisms to avoid this risk (Gerz and Boucher, 2006; Moschini et al., 2008).

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On the other hand, literature has not focused on another key internal barrier that producer groups governing GIs may face, that is, the influence of heterogeneous characteristics, resources and strategies of individual producers within a group on their level of cooperation for defining the future regulation of the GIs. In different settings of collective action, group heterogeneity has a mixed effect on the level of cooperation within an organization in terms of members' characteristics (Ostrom, 1990), resources (Anand and Khanna, 2000; Poteete and Ostrom, 2004; Sakakibara, 1997) and strategies (Heckathorn, 1993). In turn, lower level of cooperation generates conflict among private incentives that challenge the organization governance (Knocke, 1988). In the agricultural and fishery development setting, research found that increasing group heterogeneity affects common property resource management (Kanbur, 1992), influences the cooperative strategy of downstream vertical coordination (Bijman and Hendrikse, 2003; Rau and Van Tongeren, 2009), exacerbates the level of control within the organization (Cook and Chaddad, 2004; Hansmann, 1996) and makes a change in governance structure necessary (Nilsson, 2001; Nilsson and Van Dijk, 1997).

Yet, high and increasing group heterogeneity can represent a serious internal threat to the effectiveness of the collective action of producers' groups regulating established and highly recognized GIs (Profeta et al., 2009). Based on the observation of the case of the "Prosciutto di Parma" PDO Consortium (Giacomini et al., 2010), this study found exploratory evidence that firms external to the producers' group governing the GI – with different characteristics and resources – entered the organization through acquisition from local processing plants to use the GI, therefore increasing the heterogeneity within the producer group. Once becoming insiders within the organization, the new entrants lobbied for a change in the GI regulation based on their private incentives undermining the collective action of the Consortium. While the impact of group heterogeneity on the level of cooperation on the regulation of GIs is an internal barrier that may limit their future success, an analysis of this phenomenon in the context of GIs has not been conducted yet.

With the purpose of starting filling this gap, in this study we tackle the following broad question: do heterogeneous characteristics, resources and strategies of individual producers influence their level of agreement on the future of the collective regulation of GIs? To tackle such a broad question, we conduct an in-depth study of the case of the PDO Consortium of the "Prosciutto di Parma". As we found no existing study contributing to understand the relationship between group heterogeneity and the level of cooperation within producer groups regulating GIs, we adopted an explorative research approach by integrating a multi-variate statistical analysis based on path modelling with a qualitative description of the vision that "Prosciutto di Parma" Consortium members had for the future PDO labelling regulation.

## Selected background

The production chain of Prosciutto di Parma PDO involves 4691 breeding farms, 116 slaughterhouses and 164 processors (IPQ, 2011). "Prosciutto di Parma" PDO is produced in Parma, in Emilia-Romagna region, whereas pigs, according to the specifications, are bred in ten Italian regions. The 164 companies have produced 9,823,000 branded hams in 2009. The value of the "Prosciutto di Parma" is 800 million euro at wholesale prices and 1.7 billion euro at retail prices (Prosciutto di Parma PDO Consortium, 2011).

The "Prosciutto di Parma" network reflects the regional-cluster concept proposed by Enright (1998), since many important resources and capabilities are not found within a single firm, but are the result of network activities shared across members (O'Reilly et al., 2003). These bonds are both transactional – such as sharing market knowledge – and transformational – such as adapting

technology and enhancing product quality (Cantarelli, 2002; O'Reilly and Haines, 2004; Giacomini et al., 2010). They embed two categories of actors. On one hand, firms within the production chain (e.g. breeding, slaughtering, selection of meat, processing, service and distribution) are involved in such a network. On the other hand, two institutional agents, the "Prosciutto di Parma" Consortium and the "Istituto Parma Qualità" (IPQ), have governance and accreditation functions within the network. The Consortium, associating 164 ham producers, manages and protects the GI "Prosciutto di Parma" promoting its brand (the "five point Ducal Crown") in national and international markets. It also provides technical assistance and support to its members. The IPQ is an independent organization which objectively controls and verifies the origin and traceability requirements, monitoring the compliance of raw material quality and manufacturing process.

Companies producing "Prosciutto di Parma" are involved in two types of economic relations (Arfini and Mora, 1997): competitive relations, since companies aim at finding more efficient productive solutions, and cooperative relations based on mutual trust. Given their sense of belonging to the same social and cultural background, producers are less willing to act opportunistically, because this would only damage the product's reputation. However, during the last decades, new companies entered the organization and many Consortium members started to produce non-PDO hams within the same area, using the same knowledge, skills and facilities of the "Prosciutto di Parma" production. This parallel non-certified hams production has now exceeded in quantity the PDO one (Giacomini et al., 2010). The non-PDO hams, produced using foreign meat (i.e. the foreign hams) and in minimal part residual meat of the PDO circuit (the national hams), aim to exploit the "Prosciutto di Parma" reputation while being marketed at lower prices. In fact, non-PDO production costs are lower, because of lower input costs and absence of certification and monitoring processes, typical of the PDO specification. Moreover, in-store the non-PDO ham benefit from the consumers' difficulty to distinguish between the two products.

Many companies have developed their individual brand, often displayed next to the PDO label and the Consortium brand, to differentiate their products from competitors. The individual brands often distinguish specific attributes of the company's ham, like the curing period length, since the PDO specification set the minimum requirements that "Prosciutto di Parma" hams must meet. In other cases, however, the individual brand does not provide any special guarantee to consumers, except those linked to the company's reputation. For these reasons, the PDO label ("Prosciutto di Parma") and the Consortium collective brand (the "five point Ducal Crown") generally overwhelm the marketing power of companies' individual brands (Mancini, 2003; O'Reilly et al., 2003).

During the last decades the "Prosciutto di Parma" production system has also experienced a deep technical innovation. The processing methods, first artisanal and linked to rural traditions, changed dramatically during the '70s with the introduction of the refrigerated holds and new skilled workers, like salters. The technical development involved also mechanical firms inside the Parma territory that designed new machineries for the curing industry. The "pre-sliced in a tray" PDO hams represent the more recent innovation. This new process, that must be performed in authorized plants under the IPQ supervision, now accounts more than 10% of the total quantity produced.

## Methods

We follow a "grounded theory" approach (Eisenhardt, 1989; Glaser and Strauss, 1967) to explore whether heterogeneity in members' characteristics, resources and strategies influence the level of cooperation on the future regulation of an established and

highly recognized GI. “Grounded theory” allowed the analysis of a complex and dynamic issue evolving within an organization – such as a producer group managing and governing a GI – and across organizations – such as the individual group members (Stake, 1995; Westgren and Zering, 1998). Specifically, this investigation combines qualitative and quantitative evidence as recommended in grounded theory methodological studies (Eisenhardt, 1989; Strauss and Corbin, 1994). The choice of the case of “Prosciutto di Parma” PDO Consortium is coherent with this purpose for three major reasons. First, “Prosciutto di Parma” is a GI with a strong reputation in the international market; nevertheless it has been recently exposed to a number of challenges that put at risk its successful marketability (Carboni and Quaglia, 2001; Crowne-Mohammed, 2005; Fink and Maskus, 2006; Mora and Menozzi, 2009). Second, this Consortium represents one of the eldest producer groups formally created in Europe to regulate and protect the procurement, production and labelling process of a food linked to its territory of origin (Crowne-Mohammed, 2005) and represents a model for a plethora of younger producer groups that have been more recently constituted since the legislation of PDOs. Third, we found from our initial empirical observation that the “Prosciutto di Parma” Consortium has indeed recently increased its heterogeneity in terms of its individual members’ characteristics, which made it more likely to be subject to organizational and governance challenges relatively to future GI regulation (Vandecandelaere et al., 2009; Arfini et al., 2010).

Within the selected case of “Prosciutto di Parma” PDO Consortium, the data collection was undertaken in two stages. First, we conducted broad, semi-structured qualitative face-to-face interviews with the Head and eight members of the PDO Consortium, managers of the quality control and certification body (Parma Quality Institute – IPQ), key stakeholders within the “Prosciutto di Parma” chain and outside the chain, including Parma region government officials and experts at local universities, between 2009 and early 2010. In this stage, we selected our sample purposively (Yin, 1984) to have a first round of learning from Consortium members with different dimension, geographical location and product portfolio in order obtain a more solid data triangulation (Eisenhardt, 1989). This stage was instrumental to define the problem and to narrow the research question. Second, once a pattern of relationships emerged from the first phase, we designed, tested and administrated a structured questionnaire to a representative sample of 94 “Prosciutto di Parma” Consortium members between March and August 2010. The main criterion of representativeness followed was production size (in terms of number of hams produced per firm), as it was the key variable already known about the universe of Consortium members before undertaking this study (see Table 1). We have also tested the geographical representativeness of the sample, and we have verified that the localization of the sample by administrative unit is not significantly different compared to the whole Consortium. The purpose of the questionnaire was to collect quantitative data that could either support or disconfirm the emerging pattern of relationships from the first stage of qualitative interviews. Questions have been selected as a

compromise between measures validated in the literature and the opinions of the investigators based on the first qualitative stage of the data collection. Therefore, a balanced trade-off was chosen between the large number of variables which may play a significant role in the emerging theory and the measurement accuracy for each item measured (Birkinshaw et al., 2011; Eisenhardt, 1989; Marschan-Piekkari and Welch, 2004).

Consistently with this purpose, the questionnaire has been divided into seven sections for a total of 28 questions. The first section of the survey gathered information on the characteristics of the Consortium members including number of employees, annual turnover, amount of production and type (PDO or non-PDO ham), ownership (independent or owned by a multi-national corporation) and backward vertical coordination (integrated with slaughterhouses or not). Three sections of the questionnaire were designed to assess some key Consortium members’ assets including the area of origin of the meat, the procurement and marketing channels as well as the strength of the relationships with their fresh meat suppliers and customers. The area of origin of meat was measured in terms of percentage of fresh meat purchased from Parma province, Italy and abroad. The marketing channels were expressed in terms of percentage of ham supplied to modern and traditional, wholesalers, retailers and food service. The relationship strength measures included three seven-point Likert scale items on (1) the frequency and (2) the perceived importance of the relationships and (3) the extent to which the relationships were based on trust (adapted from Marsden and Campbell, 1984). Consistently with the definition of assets, procurement and marketing channels and the relationships built with them are endowments that firms accumulated over time and that can be used to create competitive advantage (Amit and Schoemaker, 1993; Day, 1994).

The final three sections of the questionnaire were designed to investigate Consortium members’ value creation strategies, branding strategies and suggested future strategies relatively to the regulation of the designation of origin. Members’ value creation strategies were assessed by asking respondents to what extent they were aiming to compete on (1) low costs/prices versus product quality, (2) on low costs/prices versus product innovation and (3) on product innovation versus product quality. The three strategies for creating superior value and compete (benefit advantage through product quality, cost advantage and product innovation) are adapted from Treacy and Wiersema (1997) and Porter (1998) to the context of ham producers. The Likert scale items with trade-offs the three strategies are adapted from Treacy and Wiersema (1997) and Graham and Midgley (2000) to be suitable for a phone interview. Branding strategies were assessed through four seven-point Likert scale measures: (1) members’ perceived importance of investing on an individual brand and (2) of developing a personal network with customers recognizing their individual brand, (3) members’ intentions to invest in their own individual brand and (4) to invest on their individual brand *rather than* on the PDO promotion. In the last section, we asked producers to give their opinion on the future collective strategy for the “Prosciutto di Parma” PDO; four alternative strategies were chosen based on the interviews performed in the first stage of the research and from opinions expressed by Consortium officials. The first option was to maintain the current situation (status quo). The second option was the introduction of a higher regulated level of label differentiation between the current PDO and a “higher quality” version of the PDO; this strategy, although already suggested by other authors (Mancini, 2003), still lacks of the Consortium general consensus to be introduced in practice (Giacomini et al., 2010). The two remaining less restrictive regulative options were the introduction of a PGI label allowing the certification of foreign fresh meat complementarily with the current PDO label or completely substituting it. The introduction of a PGI next to the PDO label

**Table 1**  
Distribution of firms per Prosciutto di Parma production classes (*n.* hams by firm), in the “Prosciutto di Parma” Consortium and in the sample. Source: “Prosciutto di Parma” Consortium.

Classes ( <i>n.</i> hams/firm)	Consortium	Sample	% Cons.	% Sample
<10,000	31	18	18,9	19,1
10,000–50,000	63	35	38,4	37,2
50,000–100,000	46	27	28,0	28,7
>100,000	22	13	13,4	13,8
Missing values	2	1	1,2	1,1
Total	164	94	100	100



would be a market strategy similar to the one adopted by the Balsamic Vinegar of Modena, where the Traditional PDO and the PGI are produced by the same producers with relevant differences in price (Canavari et al., 2006). Respondents were also asked to qualitatively explain the motivations behind their choice made. All the “Prosciutto di Parma” Consortium members were contacted first by an introduction letter. Along with the presentation letter we provided a copy of the questionnaire to be filled. Few days after having sent the letter, every company of the Consortium was contacted by telephone and was submitted to the survey.

We selected a path model (Kaplan, 2008) to quantitatively analyse the complex net of relationships between heterogeneity of Consortium members' characteristics, assets and strategies and their suggested strategy for the future of the PDO regulation. Compared to structural equation models (SEMs), which are mainly used for measurement and theory testing, path models are more oriented towards prediction (similarly to regressions) by putting more emphasis on fitting the data (Hair et al., 2010). Relatively to linear regressions, path models allow the testing of the overall fit of an entire system of equations simultaneously rather than separately (Kaplan, 2008). In such a system of equations, the dependent variable in one regression is allowed to be the independent variable in the following one (Kaplan, 2008). This feature of path models allows assessing chains of effects across multiple variables and inferring relationships of cause-effect among them (Kaplan, 2008). In this study, path analysis allows researchers to infer the effect of members' characteristics on their assets and procurement and commercial strategies and simultaneously the effect of members' assets and strategies on their suggested strategy for the future of the PDO regulation.

The fit of path models with the data is evaluated on common overall fit indexes such as (1) the maximum likelihood chi-square as a function of the sample size and the difference between the observed covariance matrix and the model covariance matrix, (2) the Root Mean Square Error of Approximation (RMSEA) and (3) the Comparative Fit Index (CFI) (Kaplan, 2008). The process of evaluating, choosing and testing path models is often “trial and error” based on these overall fit indexes and the complementary Lagrange Multiplier and Wald tests (Kaplan, 2008). Through such a “trial and error” process, we first tested and rejected a number of SEMs having networks with suppliers and networks with customers as latent factors of three individual measures. Second, we rejected the path models that included Consortium members' value creation strategies. Third, we tested alternative models with three out of the four Consortium member's marketing channel variables to avoid perfect collinearity. Specifically, based on the mentioned overall fit indexes, we chose the model including supermarkets, traditional channels and food services and excluding wholesalers. Since it was the path model with the best overall fit indexes, we used the last one to draw results.

## Results

### *Heterogeneity in consortium members' characteristics, assets, strategies*

First of all, results confirm that Consortium members have heterogeneous characteristics in terms of number of employees, turnover, amount and type of ham production, organizational structure and ownership. The average number of employees of the 94 surveyed Consortium members is 15 but 20% of our sample has five employees or less, while four members have more than 100 employees. In terms of turnover, the average is €12 million but 20% of the members have a yearly turnover of €1 million or less, while only five members have a more than €50 million/year turnover and one has a €360 million/year turnover. In terms of

total ham quantity produced and commercialized, around 78% of the total of 121,340 tons produced by the sampled members Consortium members is produced by large companies with more than 1000 tons/year output (54% of the sample), while 22% is produced by smaller-sized members with less than 1000 tons/year output (46%). If we consider the type of ham production, seventeen members out of 94 produce more non-PDO than “Prosciutto di Parma” PDO hams. In particular, seven large Consortium members produce less than 10% of PDO product out of their own ham production and therefore they mainly focus on commercializing non-PDO product. The non-PDO ham production of these seven Consortium members constitutes around 57% of the total non-PDO production of the surveyed Consortium members. They have their operations relatively distant from Langhirano (Table 2), which is the centre of “Prosciutto di Parma” production cluster. In terms of Consortium members' organizational structure and ownership, sixteen out of 94 are part of multi-national corporation, while the others are independent and managed directly by their owner. Corporations have a higher number of employees, turnover and ham production. They are in lower areas that are in relatively distant from Langhirano. They produce a relatively lower quantity of PDO ham than other Consortium members (Table 2). Finally, twelve of these 16 members are vertically integrated with the company that owns them, either upstream along the chain or downstream.

Second, “Prosciutto di Parma” PDO Consortium members' assets are heterogeneous in terms of both procurement and marketing channels. As regards procurement of raw material, only 7.5% of the slaughtered meats come from the Parma province, 77% comes from elsewhere within the Italian territory and 15.5% comes from abroad; meat from abroad is mainly procured by corporations within the Consortium (Table 2). In particular, there are eleven members out of 94 that obtain 50% of their fresh meat or more from abroad, which is meat that cannot currently be certified as PDO product. As mentioned above, PDO production rules prescribe that hogs are born and raised only in 10 Regions in the Centre-North of Italy, including the Province of Parma. Yet, PDO Consortium members are allowed also to produce non-PDO ham from hogs outside this area. As regards marketing channels, 28% of the Consortium members' output, including PDO and non-PDO certified ham, is commercialized through supermarkets, but there are twenty-five members selling more than 50% of their production through this channel. The modern retail sector is the marketing channel mainly for larger Consortium members that are distant from Langhirano, come from relatively higher areas around Parma and get supplied with meat from within its province (Table 2). Another 30% of the Consortium members' output is commercialized through traditional channels, but there are other twenty-five members selling more than 50% of their ham production through this channel. The traditional sector is instead supplied mainly from smaller companies, non-corporations and supplied with Italian meat. Wholesale represents around 39% on average of the marketing channels for “Prosciutto di Parma”, but there are 29 members selling 50% or more of their production through this channel. The remaining 4% of “Prosciutto di Parma” is marketed through the food service sector, which is mainly supplied by corporations and members with higher turnover and a relatively higher production of PDO ham (Table 2). Furthermore, 40% of the surveyed Consortium members export part of their production, while the remaining 60% market their products only domestically. The strength of the relationships with suppliers are also highly heterogeneous across Consortium members (Table 3).

Third, results from the survey show that Consortium members have heterogeneous strategies for value creation too. Results from triangular diagram in Fig. 1 (Graham and Midgley, 2000; Sneed and Folk, 1958) are obtained by (1) summing up the Likert-scale points

**Table 2**  
Correlation matrix with Consortium members' characteristics and assets.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Employee(1)	1												
Turnover (2)	.89*	1											
Altitude (3)	-.21*	-.17*	1										
Distance (4)	.10	.05	.05	1									
Corporat (5)	.47*	.45*	-.24*	.11	1								
PDO% (6)	-.05	.16	.29*	-.22*	-.14	1							
ProdTot (7)	.79*	.73*	-.32*	.10	.47*	-.17*	1						
ModRet (8)	.41*	.46*	.23*	.20*	.08	.30*	.22*	1					
TradRet (9)	-.14	-.05	.12	.11	-.22*	-.02	-.40*	.19*	1				
FoodServ (10)	.09	.18*	.16	-.05	.19*	.20*	-.05	.14	.24*	1			
OrParma(II)	.09	.09	.00	.10	.07	.18*	-.04	.33*	.15	.02	1		
OrItaly (12)	-.21*	.01	.23*	-.14	-.22*	.45*	-.34*	.02	.16	.16	-.24*	1	
OrAbroad (13)	.27*	.05	-.29*	.23*	.15	-.71*	.35*	-.10	-.06	-.10	-.09	-.57*	1

\* Denotes variables significant at 5%. The sample for the correlation matrix is only n = 61 as the cases with some missing data were excluded from the estimation.

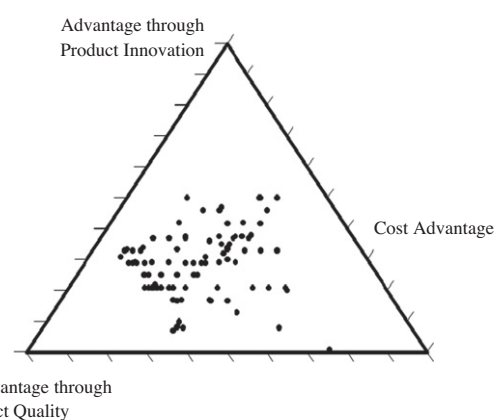
of the three strategies (benefit advantage through product quality, cost advantage and product innovation) and then (2) scaling their sums to one hundred to obtain a percentage of how much producers focus on one strategy relative to the other two. Results can be synthesized in the following three points. First, around 60% of Consortium members attempt to create value and compete by providing superior benefits to customers in terms of tangible quality (in Fig. 1, these are represented by the dots closest to the “benefit advantage” strategy corner). Second, almost 30% of the Consortium members do not seem to have a clear strategy for creating superior value than their competitors (in Fig. 1, these are represented by the dots in the middle of the triangle). Third, only five Consortium members consider innovation and cost advantage as slightly more important than benefit advantage, while only four Consortium members are more focused on gaining a cost advantage (Fig. 1, represented by the dots closest to the “cost advantage” strategy corner). To explore which Consortium members are pursuing these strategies, we run a simple regression of Consortium members' characteristics on their value creation strategies. Results show that: (1) members that are owned by corporations mainly attempt to create superior value through a cost advantage strategy rather than through innovation (Table 4); (2) Consortium members marketing mainly through traditional channels attempt to compete through a benefit advantage strategy than through innovation and a cost advantage strategy (Tables 5 and 6); (3) on the other hand, Consortium members marketing mainly through supermarkets compete through product innovation rather than a benefit advantage strategy (Table 5).

Finally, Consortium members' strategies for signalling quality are highly heterogeneous in terms of their intentions of developing individual brands and choosing their desired degree of restrictiveness of future GI regulation. More than a half of firms perceived as

**Table 3**  
Descriptive statistics of Consortium members' relationships and strategies.

Item	Mean	Std. dev.
Suppliers' ties recurrence	5.65	1.18
Suppliers' ties trust	5.24	1.54
Perceived importance of suppliers' ties	6.15	1.16
Customers' ties recurrence	5.84	1.10
Customers' ties trust	6.09	1.05
Perceived importance of customers' ties	6.47	0.94
Perceived importance of developing an individual brand	5.11	1.85
Intention of developing an individual brand	4.11	1.87
Intention of investing more on individual brand than PDO	4.32	1.95
Intention of investing more on PDO than generic ham	5.60	1.56

All variables are represented in 7-point scale (1 = not important at all, 7 = very important).



**Fig. 1.** Consortium members' strategies for value creation. Note: Each dot represents a surveyed member of “Prosciutto di Parma” Consortium. The position in the triangle is determined by the sum of three trade-off seven-point Likert scale questions asking: (1) “To what extent would you consider the quality of your product more important than maintaining lower costs/prices?” (2) “To what extent would you consider maintaining lower costs/prices more important than the innovation of your product?” (3) “To what extent would you consider the innovation of your product more important than its quality?”.

**Table 4**  
Results of the regression of Consortium members' characteristics on pursuing a cost advantage strategy vis-a-vis innovation strategy.

Independent variable	Coefficient	Std. error
Number employees	1.76	2.30
Annual turnover	-8.11	5.56
Corporation	1.51*	0.73
Modern retail	0.04	0.08
Traditional retail	-0.01	0.09
Food service	-0.15	0.12

R-Square = 0.091.

\* Indicates 95% statistical confidence.

important and very important to develop an individual brand next to the PDO label and Consortium brand, but on average few of those firms actually intend to develop individual brands and invest more on them than on PDO label (Table 3). The PDO label is still perceived as very important by the members, since the majority of them agree or strongly agree to invest mainly on the promotion and marketing of the PDO label rather than individual brands (Table 3). However, only one third of the respondents suggest to maintain the current regulation protecting the PDO label, while 45% of the Consortium members would prefer the introduction of

**Table 5**  
Results of the regression of Consortium members' characteristics on pursuing a benefit advantage strategy vis-a-vis innovation strategy.

Independent variable	Coefficient	Std. error
PDO production	-0.17	0.14
Modern retail	-0.14*	0.06
Food service	-0.29	0.10
Traditional retail	0.28*	0.07

K-Square = 0.247.

\* Indicates 95% statistical confidence.

**Table 6**  
Results of the regression of Consortium members' characteristics on pursuing a benefit advantage strategy vis-a-vis cost advantage strategy.

Independent variable	Coefficient	Std. error
PDO production	0.03	0.19
Modern retail	-0.09	0.08
Food service	0.02	0.14
Traditional retail	0.24*	0.10

K-Square = 0.084.

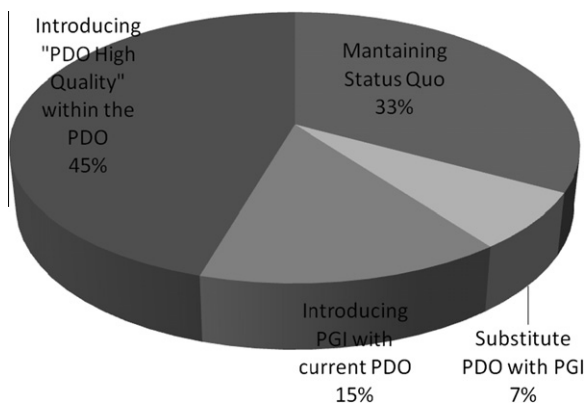
\* Indicates 95% statistical confidence.

a PDO of higher quality distinctive from the currently regulated "Prosciutto di Parma" PDO (Fig. 2). Consortium members supporting the current PDO label regulation perceive that the current PDO specifications already sets the basis for a high quality product, while there are two major reasons supporting the more restrictive strategy selected by 45% of the Consortium members surveyed. First, the current pool of products with the same PDO label has a too wide difference in terms of tangible quality, therefore consumers cannot use the current PDO label as an effective cue of the flavour, sweetness and therefore value of "Prosciutto di Parma". As quality under the same PDO label is very uncertain, the average PDO-labelled product price decrease. Second, these members perceive that a necessary increase in joint marketing and promotion activities needs to be supported by stricter quality controls to deliver to customers the promised quality. The two remaining less restrictive options – namely introducing a PGI label complementary to the current PDO label and PGI label substituting the PDO label – are chosen by respectively 15% and 7% of the surveyed Consortium members. The three major reasons supporting these less restrictive regulation choices are the following: (1) a PGI label would allow increasing the raw material supply with fresh pig meats supplied from outside Italy and so reduce the cost of a key production input; (2) the origin of the meat does not affect the intrinsic quality attributes of the product; (3) a PGI label would provide a certified recognition to the processing phase taking place within the Parma territory, even if the supplied fresh meats come from abroad, as the link among product, tradition, and territory is established during processing rather than based on the pig production and slaughter.

*Group heterogeneity and restrictiveness of future GI regulation*

We tested and failed to reject a path model putting into relationship the Consortium members' characteristics, their procurement areas, marketing channels and networks, their individual branding strategies and their suggested collective strategy for the future PGI and PDO labels. The model chosen has an excellent overall fit with the data (Table 7).

To make sure that the overall fit was not inflated because of the small sample size relative to the degrees of freedom of the model,



**Fig. 2.** Consortium members' strategy for future PDO regulation.

**Table 7**  
Path model with Consortium members' characteristics, assets and strategies.

Dependent variable	Independent variable	Std. parameter estimates	Rob. t-tests	
Number employees	Corporation E1	0.133** 0.956	2.377	
	Turnover	0.328**	12.702	
Turnover	PDO%	0.055**	2.220	
	Corporation E2	0.042** 0.428	2.491	
	Corporation E4	-0.837** 0.973	2.284	
PDO%	Corporation E3	-0.061* -0.058** 0.693	1.232 6.329	
	Modern retail	Turnover	22.023**	7.004
	Altitude	10.785**	3.490	
Traditional retail	Distance	1.382*	1.622	
	E5	0.810		
	Corporation E6	-1.312* 0.933	1.819	
Food service	Turnover	5.821*	1.904	



Table 7 (continued)

Dependent variable	Independent variable	Std. parameter estimates	Rob. <i>t</i> -tests
Meat from Abroad	Traditional retail	0.192**	3.630
	E7	0.925	
Recurrence of ties with customers	Distance	2.423**	2.939
	E8	0.949	
Trust with customers	Corporation	-0.722*	1.832
	Modern retail	0.073*	1.646
	Meat from Italy	-0.125**	2.697
	E9	0.936	
Importance of ties with customers	Turnover	-2.407*	1.674
	Traditional retail	0.088**	2.442
	Food service	-0.180**	3.311
	Recurrence ties customers	0.548**	4.415
	Importance of meat origin	0.125**	2.109
	Altitude	-1.976**	1.971
	E10	0.690	
Importance of	Corporation	-0.437**	2.445
	Recurrence ties customers	0.224**	3.410
	Trust with customers	0.458**	5.178
	E11	0.620	
Individual commercial	Traditional retail	0.271**	3.841
Network	Meat from parma	0.083*	1.309
	Importance of cust. ties	0.068*	1.540
Importance of	E12	0.837	
	Turnover	4.850*	1.860
Individual brand	Corporation	-1.678**	2.238
	Importance of meat origin	0.303**	2.758
	Imp Comm Network	0.767**	10.001
	E13	0.727	
Intention of investing on individual brand	Number employees	-4.446**	3.200
	Turnover	14.882**	3.823
	Corporation	-0.662*	1.919
	Modern retail	0.168**	3.242
	Importance meat origin	0.189*	1.563
	Importance Ind. brand	0.554**	8.460
	E14	0.545	
Intention of investing in PDO more than brands	Number employees	4.772*	1.910
	Turnover	-15.945**	2.166
	Corporation	1.168**	2.258
	Meat from Abroad	-0.160*	1.635
	E15	0.940	
Restrictiveness of	Turnover	3.506**	1.989
Certification of origin	Corporation	-0.642**	2.146
	Importance meat origin	0.160*	1.605
	Imp. ties customer ties	0.207**	1.982
	E16	0.909	

**Goodness to fit indices:** Satorra–Bentler scaled  $\chi^2 = 94.19$  on 154 d.f.; *P*-value for  $\chi^2 = 0.999$ .

CFI = 1.000; RMSEA = 0.000; RMSEA 90% confidence interval = (0.000, 0.000).

**Goodness to Fit Indices after Model- Based Bootstrapping (100 repetitions from  $n = 94$ ):** Satorra–Bentler scaled  $\chi^2 = 235.979$  on 154 d.f.; *P*-value for  $\chi^2 = .0779$ .

CFI = .8933; RMSEA = .0686; RMSEA 90% confidence interval = (0.047, 0.192).

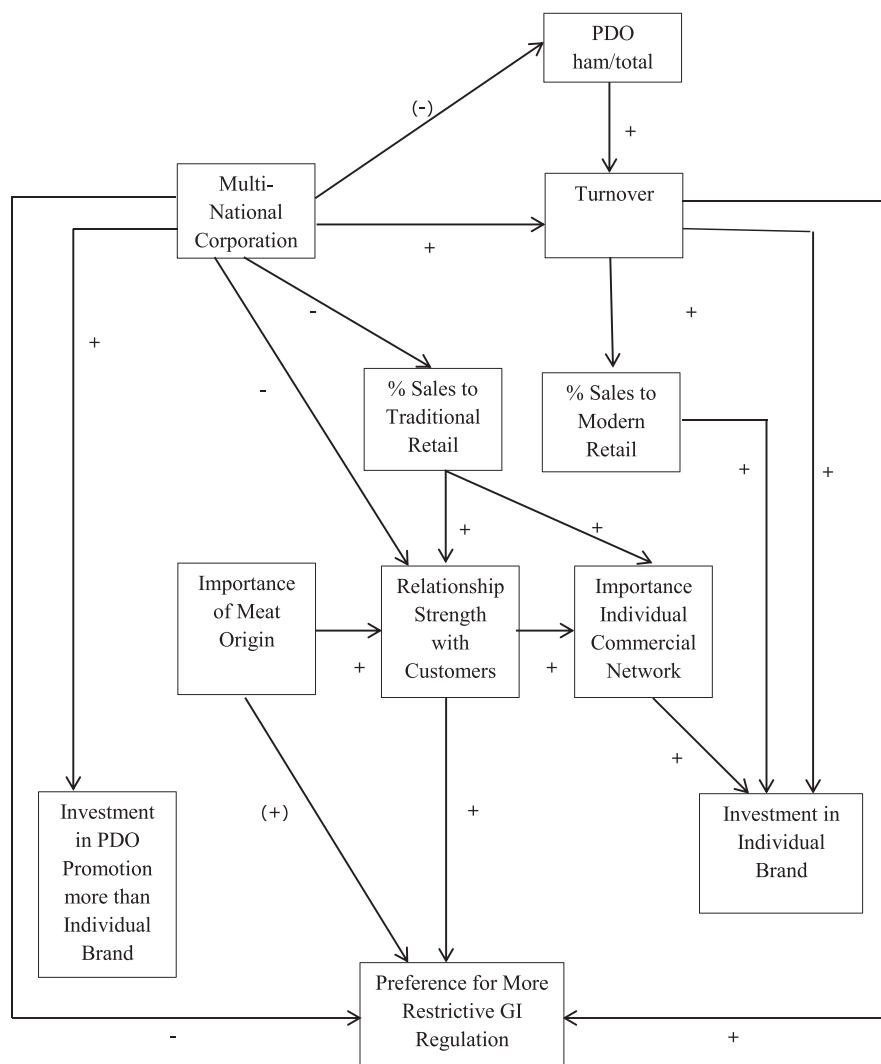
\* Denotes variables significant at 10%.

\*\* Denotes variables significant at 5%.

we performed a model-based bootstrapping simulation (Yuan and Hayashi, 2003; Bentler, 2004). Bootstrapping methods are re-sampling simulations with repetition from the initial collected sample (Bentler, 2004). Bootstrapping is widely used with path modelling and SEMs, as these models usually are associated with many degrees of freedom and therefore require a larger sample size than the collected sample (Kaplan, 2008). In this study, a model-based bootstrapping simulation increasing the sample up to one hundred repetitions leaves the overall fit of the model still acceptable on the basis of the chi-square, RMSEA and CFI (Table 7).

Findings from the path model can be synthesized in four points. First, relationships with customers are more recurrent, based on trust and considered as important for Consortium members that are not part of corporations. Companies selling mainly to traditional

retail sector have more trust-based relationships with their buyers than members marketing through other channels and see the importance of establishing an individual commercial network. Consortium members that are supplied from Italy instead have less frequent relationships with their buyers, while members supplied from Parma consider more important to establish an individual commercial network (Table 7). Second, developing individual brands is considered more important by Consortium members that are not owned by corporation and that give more importance also to the origin of the meat procured and to building of an individual commercial network. The members that intend developing individual brands are mainly selling to modern retailers, non-corporations with higher turnover but a lower number of employees (Table 7). Third, Consortium members that are mainly interested in investing



**Fig. 3.** Simplified diagram of results of the path model. Legend: + and – indicate significant positive and negative relationships between variables at 95% level. (+) and (–) indicate significant positive and negative relationships at 90% level. Note: To make it visually understandable, the diagram does not display the following variables relative to the full results (Table 7): Employees; % Meat supplied; Altitude, Distance from Production Centre (Langhirano); % Sales to Food Service. For the same reason, for the diagram displays only the variable “relationship strength with customers” instead of three variables: (1) recurrence ties customers, (2) trust with customers and (3) importance of ties with customers and only the variable “investment in individual brand” instead on the variables: (1) importance of individual brand and (2) intention to invest in individual brand.

on PDO more than individual brands are corporations and companies with a higher number of employees, while companies with higher turnover and with meat supplied from outside Italy prefer to invest mainly on individual brands (Table 7). Fourth, Consortium members with a higher turnover and that give more importance to building relationships with customers and to the meat origin would prefer more a restrictive regulation relatively to the PDO labelling based on the meat origin, while members that are owned by corporations would prefer a less restrictive regulation on meat origin for the future of the “Prosciutto di Parma” PDO label (Table 7). Key results from this path model are also synthesized in Fig. 3.

Overall, these quantitative results confirm the qualitative observation that, according to their characteristics, Consortium members are polarized in their preference for opposite strategies for the “Prosciutto di Parma” Consortium regulation that make future cooperation likely to be weak. On one hand, members that are not part of corporations and selling to traditional marketing channels see the importance of developing an individual commercial network, building their own individual brand and strengthening relationships with their customers to signal quality. They mainly produce PDO-labelled ham and attempt to pursue a benefit advan-

tage strategy by providing customers with a product of superior tangible quality. Although they recognize the importance of investing in the PDO label, the majority of them would prefer the introduction of a *more* restrictive GI regulation to effective signal the tangible quality of their products. On the other hand, members that are owned by corporations and that are larger in terms of employee number (but not in terms of turnover) are mainly interested to invest in the PDO promotion, although the ones that have a large percentage of non-PDO labelled ham mainly invest on individual brands. Qualitative evidence findings found that some of these members have recently joined the Consortium, while a large number of them have been bought by slaughterhouses to vertically integrate downstream or by Italian corporations that kept the processing operations and the historical “prosciutto” brand. Currently, many of them produce a large percentage of non-PDO labelled ham and attempt to pursue a cost advantage strategy. Although they recognize the importance of investing in the PDO label too, the majority of them would prefer the introduction of a *less* restrictive GI regulation mainly to reduce the costs of fresh meat.

This segmentation within the Consortium, although not extreme – as the turnover, the marketing channels and the intention

of invest more on a collective label signalling the origin of the product than on individual brands vary significantly within and across these two identified segments – is clearly affecting the level of cooperation on the future regulation of “Prosciutto di Parma” as a GI, specifically on its restrictiveness. Therefore, based on this combination of qualitative and quantitative evidence, we state the following proposition:

P1. The heterogeneity of Consortium members' characteristics, resources and strategies is negatively associated to the level of cooperation on the level of restrictiveness of the future GI regulation relatively to the origin of the raw product.

## Conclusions

Different characteristics, resources and strategies of individuals within a group may affect the effectiveness of collective action both in agricultural and non-agricultural settings (Bijman and Hendrikse, 2003; Cook and Chaddad, 2004; Heckathorn, 1993; Hansmann, 1996; Kanbur, 1992; Nilsson and Van Dijk, 1997; Sakakibara, 1997). In this in-depth study of the case of “Prosciutto di Parma” PDO Consortium, we found that group heterogeneity can also influence the level of cooperation among the members of a producer group regulating and governing GIs, specifically on the level of regulation restrictiveness. Group heterogeneity may represent a new challenge for the profitability of GIs relatively to the barriers already explored in the literature (Bureau and Valceschini, 2003; Giovannucci et al., 2009; Moschini et al., 2008; Parrott et al., 2002; Raynaud et al., 2005; Bouamra-Mechemache and Chaaban, 2010), especially in the case of GIs that are established and highly recognized in the marketplace. As in the described case of “Prosciutto di Parma” PDO Consortium, heterogeneity in the groups governing profitable GIs may increase in terms of members' characteristics, assets and strategies and create tensions relatively to the future regulation of GIs. In the long term, this could have severe implications on the reproduction of local resources, including the reputation of the GI product and its territory, and fail to reinforce the socio-economic sustainability of the origin-based product system with detrimental consequences on rural development dynamics (Vandecastelaere et al., 2009). Future research should investigate if this proposition holds also in other contexts of heterogeneous groups supporting GIs consolidated in the market, either from Europe (Arfini et al., 2006; Bouamra-Mechemache and Chaaban, 2010; Canavari et al., 2006; Colinet et al., 2006; García Collado et al., 2006) or other geographical regions (Giovannucci and Easton Smith, 2009; Illsley Granich, 2009).

Given the “grounded theory” approach undertaken, results from this study are explorative in nature and based on only one in-depth case, although relationships across variables have been tested on a sufficiently large and representative sample. Results consistent across comparable cases of other GI Consortia would strengthen the evidence that group heterogeneity actually brings to diverging strategies regarding cooperation and strictness of regulation. In this case, key implications for the governance of organizations regulating a GI could be drawn. Specifically, managers of groups regulating GIs – through the support of future research – should investigate how to tackle the challenge of increasing group heterogeneity within their organization in two main directions. A first element to explore should be how to effectively reduce the level of heterogeneity within the organization by either limiting the access of external members with different characteristics within an already established group or providing incentives to members to uniform their strategies. Second, it should be explored how to maintain cooperation within the organization and to preserve only the necessary elements of collective action if in presence of a highly heterogeneous group.

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