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NOTE DE L'AUTEUR

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Introduction

- 1 Coordination is the regulation of diverse elements of a system into an integrated and harmonious operation. Coordination is thus the act of arranging, putting things in order, or making things run smoothly together. In many settings, the price system can effectively coordinate economic activities. However, there are many instances, e.g., when there are few players, when the information is not complete, etc., in which the market system cannot work properly and other means emerge to coordinate economic activities, as other contributions in this special issue show.
- 2 In this paper, we are interested in a special type of coordination, based on collective reputation, in which otherwise independent firms share a common (regional or else) brand. Reputation has long been recognized as a market force that may ensure contractual performance (Klein and Leffler, 1981). When information on some traits or behaviors of the parties involved in a transaction is missing, repeated transactions and the emergence of reputation may correct market failures that would emerge in one-shot interactions. Individual reputations, that is the reputation emerging for individual agents

following their behavior, have long been studied and the literature is now quite large (for an introductory survey see, for example, Bar-Isaac and Tadelis, 2008). The literature on collective reputation, on the other hand, is rather limited in general (for a seminal contribution see Tirole, 1996) and even more so for the agricultural sector, where there are indeed many instances in which producers share a common brand.

- 3 In Europe, probably the most well-known examples of collective reputations in the agricultural sector are the protected designations of origins (PDO) wines (formerly known as *Appellation d'Origine Contrôlée*, or AOC).¹ PDOs, together with protected geographical indications (PGIs), are the backbone of the geographical indications (GIs) system by which the EU regulator has institutionalized the link between the quality attributes of a good to the geographic location in which production takes place, i.e., to the *terroir*. Bordeaux, Champagne, Chianti are some of the typical instances: wine producers in those regions can sell their product - when produced respecting some shared rules, i.e., *cahier des charges*, - using the name of the region to make their product more recognizable and possibly benefit from a better reputation.
- 4 PDO wines may be the best known cases, but there are many examples in other food industries, for instance Camembert or Parmigiano Reggiano cheeses, Parma's ham, Somerset Cider Brandy, etc. Historically, there is evidence that high quality agricultural products of specific areas were associated with geographical names since the century BC (Bertozzi, 1995). These regional brands allow agricultural products to be more easily recognized by consumers, and in many cases ensure higher prices and returns to firms. For these reasons, there is public recognition and support for these collective endeavors by agricultural firms in many countries.²
- 5 But collective reputation is not only regional brands. The members that deliver their milk to a cooperative's processing facilities share to a greater or lesser extent collective reputation. Membership into the *Label Rouge* label is another of numerous instances. All these firms benefit from a shared reputation, but also risk from actions undertaken by other firms associated with the collective brand that may finally affect their economic well-being.
- 6 The objective of this paper is twofold. First, we discuss the functioning of these collective brands, in particular the interactions among the firms that form and manage them, and we highlight some of the relevant problems of collective reputation in agricultural markets. The law usually grants a group of firms (or agricultural producers) the authority to manage the functioning of the collective brand: the group can decide on who can join it, on the production rules and their monitoring/enforcement, on who should be possibly expelled in case of violation, etc.
- 7 Thus the PDO is owned and managed by the group on a democratic basis. However, firms within collective brand can be heterogeneous, thus with different incentives and different payoffs following the seizing of the market opportunities that the collective endeavor may permit. Seizing these market opportunities often lead to choices that have differential impacts on members, with some that are eager to seize these opportunities and others that are reluctant, possibly afraid that these choices may damage the reputation itself. We will illustrate some of these recent conflicts among members and controversial choices that ensued, either by the group managing the PDO or by some members that disagree with the majority's decisions. Some of these controversial choices even reached the media, witnessing the different positions and interests within these groups.

- 8 We look at the problems for the industry, describing some recent cases, but we also consider some of the questions that policy-makers may face in this area, in particular which governance or hierarchical structure of the collective reputation system, such as a geographical indication, may be designed to resolve or reduce conflicts among different interests, that is to possibly align their interests. We thus compare some examples of different PDOs, highlighting some of the issues that emerge and that may warrant further investigation.
- 9 The second objective of the paper is thus to suggest some venues for research that could help in designing better policies for collective reputations. After briefly reviewing the literature on individual reputation,³ we discuss collective reputation using recent developments in the economics of reputation, a vast and growing literature that can be distinguished - in a very rough and arbitrary division - between models of *imitation* (i.e., the low quality type would like to be confused with the high quality type) and of *separation*, when the good type does not want to be confused with the bad type (Bar-Isaac and Tadelis, 2008).
- 10 We discuss some aspects of the problems emerging from recent controversies that involve firms belonging to collective brands, and we illustrate some other cases that share some of the main features explained above. We will argue that some of the problems highlighted in the paper have not been yet thoroughly analyzed, in particular the democratic-decision process and the heterogeneity across firms. We finally highlight some questions that would deserve investigation for policy-making purposes and conclude the paper.

On the literature on reputation

- 11 There are many situations in which consumers may be uncertain about the quality of a good until after consumption, as is the case of experience goods (Nelson, 1970), and asymmetric information may lead to market failures (Akerlof, 1970). Different market solutions may emerge to mitigate these failures, and reputation has been recognized as an effective means (Klein and Leffler, 1981). When a consumer cannot observe some of the quality attributes of a good or service before consumption, she may rely on a firm's reputation⁴, that is on her beliefs about the quality that can be associated with that firm's product.
- 12 The buyer indeed can gather information and form her beliefs from different sources, such as direct observations of the seller's past performance, experience with other firms, reports from other parties (e.g., word of mouth), and others. There are different ways to model reputation and in recent years many contributions, both theoretical and empirical, have been published.

Individual reputation

- 13 If we focus on the information provided by past transactions, we can distinguish between three broad classes of models for individual reputation: hidden information, hidden action, and mixed models (Bar-Isaac and Tadelis, 2008).⁵
- 14 In pure hidden information models, the seller has not active role in influencing the outcome of a transaction, but the quality of the good depends however on the seller

characteristics (type). In this class of models, reputation is modeled as the consumer's beliefs on the firm's type. Beliefs are generally modeled as (posterior) probabilities, and the updating of the beliefs (following Bayes' law) is based on the success or failure of the good, i.e., the personal history of the firm. Reputation is thus modeled as the pure learning of the seller's type, which is considered an undelying truth, not manipulable and that can be learnt using past performance.

- 15 In pure hidden action models, the firm can be of a unique type, but the uncertainty on quality depends on the firm's equilibrium behavior. In other words, firm's quality depends on its actions and the reputation is modeled as the beliefs that the consumer has regarding firm's equilibrium behavior. In this class of models, the repeated nature of the transaction allows for reputation to establish and for punishment to be used in case of deviations. The carrot and stick approach induces firms to balance the short-run incentive to shirk on quality against the long-run risk of losing the business opportunities.
- 16 In mixed models, possibly the more realistic class, the quality of the good depends both on the type and on the actions of the seller. Reputation is thus represented by the buyer's beliefs on the type of seller and on the anticipated equilibrium behavior of different types. When the seller knows her type, i.e., in signalling models, there are usually (at least) two types: one type of firm, the *strategic* or opportunistic kind, who may decide whether to produce high or low quality; the other, the *commitment* type, who always choose the same quality level.
- 17 Mixed models can then be distinguished in two sub-classes. In the *imitation* models, the commitment type always produce high quality, while the strategic type is the bad type that may decide to produce high quality to be confounded by consumers with the good type. In the *separation* models, on the other hand, the commitment type is the bad type firm (in fact it is refereed as the inept type) which always produce low quality, while the strategic type is the good type firm which may decide to produce high quality good to be distinguished from the inept (bad quality) seller.
- 18 Notice that in all models there is a repeated game and hence what goes around, comes around. However, while in hidden action models inadequate behavior faces retaliatory punishment, in hidden information and mixed models the trick is done by beliefs: after bad outcomes, consumers update their beliefs to take into account the higher likelihood that bad quality will persist and become aware of the firms that sold bad quality (Bar-Isaac and Tadelis, 2008). The outcome (or quality) of today is determined by the seller's action or type, but buyer's beliefs are updated and hence outcomes influence also future transactions.
- 19 In the models of individual reputation, few factors can explain to what extent reputation can be effective in sustaining efficient trade. First, the degree of uncertainty about the seller. Then, the speed at which consumers learn from outcomes, for instance how fast information travels across buyers. Moreover, the seller's patience (her discount rate), since the more patient the seller the more she values the future. And finally, the characteristics of demand, that make buyers more or less sensitive to reputation.

Collective reputation

- 20 While the contributions on individual reputation are very numerous and still burgeoning, those on collective reputation are more limited (though increasing). Tirole (1996) is the

seminal reference, representing one of the first contribution to model group reputation as an aggregate of individual reputations. It is an overlapping generations model, with a matching game, where each group member's past quality is observed with noise. There are three type of agents - honest, dishonest, and opportunistic - and the presence of the honest type creates incentives for opportunistic to create a reputation.

- 21 The general model comes with two variants: one in which the incentive to sustain the reputation comes from the fear of direct exclusion by the trading partner, the other from the fear of delegated exclusion, that is of being excluded from the group, for example by being fired. The model is quite general, but it is applied in two different settings, to explain corruption in social groups and quality in firms (a workers' cooperative).
- 22 Different results emerge, but the most interesting is probably that individual reputations are determined by collective reputations, and vice versa. A member's incentive to maintain an individual reputation is stronger the better the group's reputation. Reputational externalities are long lasting, and vicious circles may emerge, where new members of an organization may suffer from the choices of their elders long after the latter are gone. In the case of firm quality, mass firing (even of honest workers) may be the only chance to recover from bad reputation. Moreover, increased competition reduces individual incentives to sustain reputation and hence can damage firm reputation.
- 23 Winfree and McCluskey (2005) suggest a model where, contrary to Tirole (1996), the number of firms in the group becomes important and individual quality is not observable. The collective reputation is based on the group's past average quality and it is seen as a common property resource. In addition, like in other models with hidden action (e.g., Shapiro, 1983), the consumers observe past quality with a lag.⁶ In general, it emerges (like with the case of a common property resource) that with the increase of the number of members the incentives for each individual to milk, i.e., to free-ride, on the group reputation increases. They consider two possible strategies for the members: with a minimum quality standard, the group can reduce or avoid free-riding, while with trigger-strategies individual firms (since their quality is not traceable) would extract too much from the stock of the collective reputation.
- 24 Some recent papers have looked at the coexistence of private (or individual) and collective reputations. Landon and Smith (1998) estimate the impact of product quality and reputation on prices and decompose the reputation impact into individual and collective reputation effects. With a modified hedonic model, they use data for Bordeaux wines and find that the impact of reputation on prices is twenty-fold bigger than the impact of current quality, thus suggesting a major role for reputation in price formation. Moreover, collective reputation indicators play a significant role in price formation via their impact on expected quality, and thus affect prices to the extent that they are good predictors of quality. Overall, they also show that empirical models that include proxies for individual and collective reputations are more predictive than either individual-only or collective-only models, thus justifying the analysis of the dual impact of reputations.
- 25 Costanigro et al. (2010) suggest an empirical hedonic model to jointly analyze product, firm and collective reputations.⁷ Using data from California wines, they disaggregate reputation premia into different quality performances, considering not only average quality but also consistency of quality and name longevity, in a model that nests specific and aggregate names. They show that both average quality and consistency of quality are

important. Moreover, reputation premia decreases as names become more specific, i.e., as one goes from collective to individual to product reputations. Last, their data show that the use of collective reputation is important for inexpensive wines, while in premium wines specific names become more important. Indeed, they argue that when consumers spend more for wine, the cost of making a bad choice, i.e., buying a bad quality wine for high price, is higher and this justifies the higher search costs borne by consumers when switching from aggregate to specific names.

- 26 Costanigro et al. (2012) further elaborate on the coexistence between private and collective reputations and investigate their dual impact on the investment in quality by the firms. Their dynamic game model nests Shapiro (1983) and Winfree and McCluskey (2005) as special cases. They thus have state transition equations that proxy the evolution of common beliefs: one set for private reputations, where the updating for the buyer is based on the discrepancy between current and expected quality, with some exogenous parameters for the information lag (as in Shapiro, 1983) and for the brand-visibility. In the equation for collective reputation, the expected quality is the weighted average of the group quality, with two variants of the model: one, as in Winfree and McCluskey (2005), where all members have the same weight,⁸ and another in which some firms, the reputational leaders, may have a greater weight.
- 27 They parametrize the model with Californian wines data and run simulations. They confirm that quality and reputations increase as consumers find it easier to learn; however, investment in quality may be inefficiently low without coordination. Using quantile regression, they also confirm that private reputations become more valuable the more expensive the wines are. Last, collective equilibrium reputations increase with the presence of a reputational leader (however, the differences between the coordinated and competitive equilibria increase with the magnitude of the leadership).
- 28 Menapace and Moschini (2012) extend the Shapiro's (1983) model to investigate the coexistence between collective reputations, in the form of geographical indications (GIs) that focus on the use of names linked to the geographic origin of a product, and private trademarks. They consider a model with an experience good, competitive equilibria, and perfect elastic supply. Regarding geographical indications (GIs), they compare two institutional settings: the EU *sui generis* scheme, that is the collective reputations enforced by the EU (Reg. no. 510/2006), which reveals the region of production and specifies some production rules (cahier des charges, which they model as a minimum quality standard), and the US specification marks, which reveal only the production region (like the American Viticultural Area or AVA).
- 29 They find that individual trademarks and collective GIs are complementary instruments to signal quality. In addition, they show that GIs decrease the costs of establishing private reputations. Moreover, the welfare gains accrue to consumers (in particular those with a taste for higher qualities), because GIs reduce the costs of building a reputation, also for entrants, and hence reduce the value of established reputations. Last, while both the EU's *sui generis* GIs model and the US model of certification marks mitigate the moral hazard problem (by limiting the scope for opportunistic behavior when revealing some relevant information), the EU model seems better to the extent that it discloses more information.
- 30 All these models of collective reputation are in the pure hidden action class. One noteworthy exception is the paper by Fishman et al. (2008), a mixed (hidden action and hidden information) model, where firms know their quality and the strategic firms are the good quality type, i.e., a model of separation. Collective branding is modeled as a

group of $m > 1$ firms of high-quality, marketing together their products under a common brand name, but still retaining full autonomy regarding business decisions and profits, in particular deciding individually whether to invest in quality.

- 31 In general, the returns on quality investments depend on how well consumers are informed about firm's past performances: for instance, with word of mouth communication, the number of consumers who have experienced the product in the past.⁹ The critical assumption of Fishman et al. (2008) is that consumers evaluate a firm's quality on the basis of their overall experience with the collective brand and not only on the basis of its individual past experience. Collective branding thus provides more information because a consumer can now obtain, for each member of the brand, a number of observations equal to the number of members in the brand.
- 32 They then show that a good brand reputation is more valuable to its members than a good stand-alone reputation, i.e., this is the *reputation effect* of branding. However, there is also a *free-riding effect* on the other members' investment, and so the overall effect of the collective branding depends on the interaction of these two opposing forces. Under perfect monitoring, free-riding is precluded and cheating, i.e., non-investing, firms are expelled. In this simple case, the incentive to invest increases monotonically with the brand size and collective branding leads to higher quality. Without free-riding, increasing brand size gives more observations to consumers about the brand type and thus incentives to invest are greater than in a stand-alone case.
- 33 With imperfect monitoring, possibly a more realistic case, in which the brand is unable to monitor and enforce investment of individual members, the reputation effect needs to be stronger than the free-riding effect for the brand to induce more quality investments than the stand-alone firm. This happens when the group is small and/or the expected quality from investment is high. Indeed, if the brand is large, the collective brand incentive to invest is lower than that of the stand-alone firm, because the marginal contribution of an individual member's investment to the brand visibility and reputation becomes negligible compared to the payoff from free-riding.¹⁰

Critical choices for collective brands

- 34 Since at least the national regulations on AOC, the law has granted the authority to manage the collective reputation to a group of producers sharing some production techniques in a given area. The group decides on the production rules, on their monitoring and enforcement, on who can join or who should be expelled in case of violations, etc. The collective brand is thus owned and managed by the group on a democratic basis and the firms can use the collective brand, alone or together with private labels or brands.
- 35 Quite a few of these groups have been facing different kind of choices that have lead also to difficult decisions. Many citizens are aware of the existence of these collective groups (e.g., as consumers of some PDOs), but not much is known about their functioning, except in those few occasions in which news reach the media. Indeed, in some cases news of conflicts among members or of controversial choices by either the groups managing the PDO or by some members that disagree with the majority's decisions (and that may leave the PDO) are - possibly strategically - leaked into the media.

Industry choices

- 36 In the cheese sector, for instance, in the Camembert region, there have been controversies regarding whether to allow for the possibility to use pasteurized (instead of raw) milk within the production for the Camembert de Normandie PDO. Pasteurization has been proposed by large firms, in order to solve some food safety issues related to a particularly resistant bacterium, *Listeria*. Unlike many other germs, *Listeria* can grow in the cold temperatures of the refrigerator but can be killed by cooking and pasteurization. Defenders of the status-quo, in particular small cheese producers, argued that raw milk was at the origin of the unique features of Camembert de Normandie. Following the controversy, some producers left the AOC in 2007 and produce Camembert fabriqué en Normandie. However, there have been some lawsuits for usurpation de notoriété, which have yet to be settled (Le Du, 2014).¹¹
- 37 Similar controversies emerged when Camembert cheese producers were asked to produce a private label version for a major retailing firm. Some producers, notably the Cooperative d'Isigny, were in favor, hoping to find a new market outlet for their products. However, other producers, together with the Institut National des Appellations d'Origine (INAO), were afraid that such a choice would banalize the Camembert brand (INA, 1997).
- 38 Indeed, with the evolution of the retailing sector and the growing importance of private labels, some PDOs were asked (or were faced with the *fait accompli* when some members started) to produce for a retailing's private label. The question of whether blending the PDO's (or any collective brand) reputation with that of the retailer's private label emerged probably for the first time with the case Roquefort Casino. The regulations of the AOC Roquefort did not allow retailing firms to produce the cheese, but Casino in fact was sourcing from a small producer in Roquefort. As it has quite long been recognized, this tendency of the retailing sector is due to the fact that the geographic indications have had the tendency to attract or reassure the consumer (ANF, 1998).
- 39 But other similar cases concern other EU countries and other agricultural products. One recent example concerns Valpolicella, the second more important region for red wine production in Italy. Firms in the area produce different types of red wines, but in the last decades Amarone, a strong and full bodied type, has been the most valuable wine, fetching prices way above those for other types of wine coming from the same area and varieties.
- 40 Historically, Amarone was produced in well defined hilly areas, considered better suited to give higher quality grapes. Over the years, however, because of an increasing demand, Amarone production has been expanding to other areas as well, in particular in the plain valleys, where yields are higher but quality possibly lower. This de facto situation however contrasts with de jure one, that is the rule that allowed Amarone to be produced mainly in the classical hilly areas. Therefore, the *Consorzio di Tutela*, i.e., the body managing the Valpolicella PDO, has recently suggested allowing the production of Amarone in plain valleys as well (dell'Orefice, 2013b). The proponents argue that the rule was a typo in the original 1968's cahier des charges; in addition, scratching the rule would recognize what is the reality of production, since a lot of Amarone is already produced in the plain areas (dell'Orefice, 2013a).
- 41 However, many firms, notably those that have heavily invested in the Amarone production technology and that are also better known worldwide, are against the

modification and argue vehemently that Amarone production should remain confined in the hilly areas, where quality is higher (Guerrini, 2013a).¹² Some of them also threatened to leave the PDO (Guerrini, 2013b). The 10th of May 2013 the assembly of producers, after an unanimous decision by the Board of Directors, confirmed by majority the abrogation of the rule.¹³

Modelling choices

- 42 These cases are far from being unique, but represent probably only the better known instances of regional brands facing critical choices. We believe that most of these different situations of conflicts within the brands share some common features. There is a group of firms using a regional brand, i.e., the PDO, and the group is formed by heterogeneous firms. With some simplification, there may be high quality types and low quality types. There is a market opportunity that could be jointly seized by the PDO, such as a new market, the adoption of an innovation that could lead to a cost-saving technology or to a possible quality improvement (quality vs. tradition?), etc.
- 43 To seize this opportunity, however, a decision needs to be taken by the group, e.g., a change in the *cahier des charges*. But while some firms are in favour of adopting and implementing the changes needed to seize the market opportunity, others are against these changes, probably worrying of their bad effects on the collective reputation. Decisions on rules (and possibly on their enforcement) may be taken with some democratic process, e.g., using majority's voting. Finally, the group decides to seize (or not) the market opportunity. In the new equilibrium, new markets may be entered, innovations adopted, etc., with some member firms benefiting and other possibly losing out, so that they may even decide to leave the PDO.

Heterogeneity

- 44 Some of the critical features of these cases are still missing from the reviewed models. First of all, members of the collective groups are heterogenous. Some are small, others are big producers, like in the case of the cheese sector. Some are vertically integrated, e.g., make their own wine, while others deliver their products to a private or cooperative processing facility. Some are potentially of higher quality than others, because of location (e.g., hilly vs. plain areas in some regions), technology adoption, tradition, know-how, etc. Being heterogeneous, members may have different incentives and payoffs, which may explain their positions and decisions.
- 45 We believe realistic models should take heterogeneity into account in order to match predictions with anecdotal evidence. For instance, one would expect that more homogeneous groups should be less conflict-prone. One might explain some bad equilibria or outcomes not necessarily based on the size of the group, as suggested by Fishman et al. (2008), but on the relative importance of bad vs. good types in the group. In fact, a small group may have problems because it is heterogeneous, notwithstanding its small size. And vice versa, a relatively big group may still function rather well because it is homogenous.
- 46 Moreover, further investigation on the interaction between private reputation, collective reputation, and heterogeneity may explain different outcomes observed in the industry. Some good quality firms may prefer to rely only on their own reputation (i.e., much

better individual than group history) and hence leave the group (and give up using the regional brand) when the majority is formed of too conservative or lower quality firms. In Tuscany, for instance, in the seventies some producers left the Chianti PDO (and their required Sangiovese plus local varieties blend) to experiment blending with other international grapes, i.e., Cabernet, Merlot. These experimentations have led to the production of the so called Super Tuscan wines, that initially could be produced only outside the PDO as table wines. Eventually, some producers have started a brand-new PDO (e.g., Bolgheri), producing wines that have become more famous (and expensive) than the original PDO ones.

Internal decision-making

- 47 While some of the decisions regarding regional and collective brands are taken by policy-makers, at the EU or national level, many others are left to the group of producers managing the brand. Usually these groups are governed with democratic decision-making processes. However, different bylaws or statutory rules (e.g., whether a group needs a simple or a qualified majority to modify some rules, or whether voting is proportional to production or based on one-head-one-vote), governance structures (e.g., whether in a big group members can vote directly or by means of elected committees), group composition (e.g., whether a group is formed by a majority of small or big producers, or of high or low quality producers), etc. may all influence outcomes and industry equilibria. For instance, what equilibria emerge may depend on whether small (or low quality or traditional etc.) producers have the majority, and to what extent they are free to decide on rules according to their best interests. In general, *ceteris paribus*, decisions taken with different voting rules or structures may give very different outcomes, and so these issues should be considered as well.

Tradition vs. innovation

- 48 The case of the Super Tuscan wines is interesting also because it shows the dilemma of tradition vs. innovation. These experimentations had the objective of producing wines for long aging, like the better known from Bordeaux. Some producers tried with Cabernet and Merlot only, i.e., Sassicaia, in a terroir that was similar to the Bordeaux sub-region of the Graves. But in other cases, e.g., Tignanello, producers tried the main local variety, Sangiovese, alone or with a 15% of Cabernet-Sauvignon.
- 49 Some of these experimentations were considered valuable and compatible with the *cahier des charges* and so later on incorporated into the Chianti rules, while in other cases producers preferred to continue selling them as table wines. However, thanks to these innovations it has now become clear that Sangiovese has a great potential for producing long aging wines, confirming Barone Ricasoli's intuition and choices a century later.

Restricted production

- 50 Another dimension which may be useful to consider when analyzing collective reputation is the choice of production levels, in terms of quantity or cultivated area. Most of the papers consider firms that produce only one unit of production when they decide on the optimal quality level.¹⁴ However, it is well known that different practices may increase yields but impair quality. In wine production, for example, if a vine-grower chooses more

productive clones, pruning not correctly, or putting too much fertilizer, quality will inevitably be compromised (Johnson and Robinson, 2001).¹⁵ Among the cheese producers of the Bas-Normandie, the critical question recently posed was, indeed, whether they should be producing more or producing better? (Le Du, 2014).

- 51 Many, if not all, regional brands specify also the production area and producers can benefit from the regional brand only if they belong to that area, on the claim or presumption that better or recognizable quality comes with belonging to the restricted area. To our knowledge, the only paper that does not consider unitary production is the model by Menapace and Moschini (2012), where they have a perfectly elastic supply. However, they recognize that some of their results, in particular that the positive welfare effects accrue to consumers while producers have negligible or negative effects, may change in a model with restricted land.
- 52 Indeed, higher prices translate into higher rents for fixed factors, i.e., higher land values. The land value differences for farms either inside or outside of PDOs areas can be very high, and often the source of conflicts. For example, in 2007 land values within the Champagne area were up to 50 times higher than ordinary land just outside it. Controversies (even lawsuits) over the delimitation of production areas have followed. Some producers in villages located just outside the official Champagne area have argued that their quality is comparable (if not better) than that of the villages within the Champagne delimitation (Jefford, 2008).¹⁶ We believe it would be interesting to investigate the effects of different productive levels (or delimitations of production areas) on reputation and hence on quality.

Reputation-building costs

- 53 The costs of reputation-building may have a different impact on firms of different sizes. It has been shown that larger firms benefit more from private reputation (Rob and Fishman, 2005). They may indeed find it profitable to use private brands and so they can rely on (at least) two strategies, that is on their own individual brand and on the collective one. But for small firms the problem may be quite different, since a private brand with an individual reputation may be prohibitively costly to set-up. Sharing the costs of a brand through a collective endeavour may then become interesting.
- 54 Indeed, it has been recognized that PDO regulation has proved successful in allowing even small producers to benefit from a well-established reputation (Bureau and Valceschini, 2003). More recent empirical evidence has confirmed that small firms voluntarily adopting a PDO in the dairy sector have a higher rate of survival compared to large firms that may benefit more from economies of scale or own quality brands (Bontemps et al., 2013). Even though the PDO-effect is less pronounced than the size effect, i.e., larger firms have better chances to survive in the industry, it emerges that the benefit of the PDOs is significant for small firms. Collective reputation can thus improve the competitiveness of the small agro-food firms. However, how costs are shared is another issue (see, e.g., Crespi and Marette, 2001).

Value creation in vertical relationships

- 55 A successful collective reputation may attract consumers and as such be a useful tool to retain value in vertical relationships. One recent case, taken from outside the agricultural sector, is illuminating on the the role and the effects that collective reputation may have

on this regard. A recent TV show (Dielhenn, 2014) has illustrated the different choices made within the French coutellerie artisanal.

- 56 Thiers has a very long tradition in forging blades. There are archeological reports showing that this activity was well pursued in the century. In recent decades, this long tradition, together with the diversification of production, has permitted to the many firms in Thiers to provide the majority of French blades and knives (Barriquand, 2008). In particular, Thiers' firms have been the main suppliers of Laguiole for long time. In 1994, local firms have registered a collective brand, i.e., *Le Thiers*, managed by the *Confrérie du Couté de Tié*, a group of firms that assign the right to use the brand to those firms that follow the cahier des charges. When granted this right, a firm may put the collective brand logo together with the firm name on the blade.
- 57 Laguiole cannot claim such a long history - apparently, it all started in 1987, but the real production jump started in 1987 - but on the other hand it is better known both in France and abroad. *L'abeille de Laguiole* is thus a better known regional (informal, yet) brand. However, in the last couple of decades many firms have chosen the low quality end, outsourcing production to Asia, while few others, e.g., *Forge de Laguiole*, have invested in quality, creating individual brands that try to benefit from the common reputation and retaining further value by vertically integrating all production phases, including the forging of blades traditionally outsourced (apparently about 70% to forges in Thiers) (Parisien, 2013).
- 58 To increase value creation, in both areas good quality firms have thus vertically integrated: in Thiers downstream to produce the other knife components to sell not only blades but complete knives, in Laguiole upstream by forging their own blades. However, while Thiers has chosen a more coordinated approach to build a collective reputation from a centuries-old know-how, Laguiole is following an uncoordinated path of different initiatives to possibly use the better known collective reputation.
- 59 Another interesting twist of the dispute between Thiers and Laguiole is represented by a recent collective attempt of Laguiole firms to obtain the *Indication Géographique Protégée* for their knives. However, French authorities so far have recognized Thiers' contribution by including both areas in the definition of the relevant IGP production area, and so protests and lawsuits have erupted (Depeche (2014)). Following-up on this dispute and comparing Thiers and Laguiole management strategies of collective branding may help in understanding how better retain value in vertical chains.

What (self?) regulation

- 60 Some of these missing elements may be needed for a better understanding of the controversies and equilibria we observe in the industry, but also to provide possible support for policy-makers designing regulations. There are issues over which policy-makers may not intervene, otherwise they would risk limiting firms' freedom of enterprise, but some other issues may be investigated since they may provide interesting and useful insights. There are at least three set of questions that may prove worth pursuing.

The questions

Monitoring

- 61 First, the choice of the optimal monitoring system of the production and quality of these collective groups. There may be different solutions to choose from. Some may be based on private third parties, like the case of anglo-saxone countries and those used in some labels and conformity certifications. Others may be based on different public bodies (e.g., in France the INAO, the Ministry of Agriculture, the Veterinary services and the Directorate for competition, consumption and frauds all control the PDOs (ANF, 1998); or they may rely on a unique public body, which may represent either mostly the producers, the consumers, or the citizens' health. Finally, in some cases, even the firms belonging to the PDO may be granted the authority to monitor the enforcement of the rules by all firms using the brand.¹⁷
- 62 It may be worth investigating what happens when the monitoring or enforcement of the rules is assigned to the firms managing the PDO.¹⁸ Should a different equilibrium be expected compared to a monitoring left to public bodies? Can we expect different monitoring or enforcement efforts depending on which type has the majority in the group? One could predict that when a group is formed mostly by low quality types, because of history and/or bad choices in the past, the PDO may be stuck in a bad equilibrium outcome, e.g., lower quality investment levels; in addition, rules may be more relaxed, and/or enforcement/monitoring less strict, because it may become politically unsustainable otherwise. Some good types may prefer to leave the group or rely almost exclusively on their private brand. On the other hand, when groups are formed predominantly by good quality types, we may observe higher reputation (and investment) for quality with possibly a stricter enforcement of the rules. Low quality types may find these rules quite costly, still they may choose not to leave the PDO since they benefit from high collective reputation.¹⁹

The optimal shape of collective reputations

- 63 Another set of questions is on the optimal structure of the system of different appellations and the relationship between private and collective reputations. In the wine sector, for instance, all EU appellation systems are based on the idea of the *pyramid*: at the base the *vin de table* and the *vin de pays* (the *Table wines* of the EU), then the *vin délimité de qualité supérieure* and finally the *Appellation d'Origine Contrôlée*, or AOC (the quality wines produced in specified regions of the EU) at the top of the pyramid. However, even within this common system, there are different models to look at, both in France and elsewhere.
- 64 Consider the PDO system for the major French wine regions. In Burgundy, within the PDO system there is a hierarchy, which in fact represents a qualitative classification, of the about 1000 land plots (the *climats*) available. The 33 best plots are the *Grand Crus*, representing around 2-3% of the production, that are allowed to use only the name of the climat, e.g., Romanée.²⁰ The about 500 second-best climats are the *Premiers Crus*, which represent less than 20% of the production. They can use the name of the premier cru and the name of the village where they are located. Then, there are the appellations at the village level (there are more than 50 and represent about 30% of wine production).²¹

Finally, the regional or district appellations, e.g., Bourgogne, which are 22 representing about 50% of lower quality production, that can use only the regional or district name on the bottle label. These climats are usually located west of route N74.

- 65 In Bordeaux, the famous classification into crus (or growths, from first to fifth), is based of the 1855 hierarchy which classified chateaux (the wine producing estates) and not plots. It had mostly estates from the Medoc area (except for Haute-Brion, from the Graves), and it has remained quite fixed over the years, with few new entries and some exits. In addition, few other concurrent classifications (e.g., the St Emillion, the Cru Bourgeois, etc.) have appeared, some also updated every decades or so, but overall not sharing a common standard.
- 66 Both the Burgundy and the Bordeaux classifications were prepared in 1855, from information coming mostly from wine merchants (but not only) who reported wine prices that then were probably reflecting the quality of wines. However, in Burgundy agricultural holdings were very fragmented and the quality of the Pinot Noir wine was very heterogeneous among different plots. Moreover, the investigation into the determinants of quality and the mapping of the area had a long tradition. Wine merchants were buying wines from different Burgundy areas, learned to distinguish the quality of wines coming from different climats, and so the prices of the grapes were reflecting the quality potential of different plots. In short, still nowadays the general validity of the hierarchy is well supported by the market (Lewin, 2010).
- 67 In Bordeaux, on the other hand, wines were coming from different estates, not tied to specific plots, and the 1855 classification was a freeze-frame of the prices that different chateaux were fetching in the previous years. However, wines have changed a lot from the *Claret* type that was traded in the first half of the century. In addition, many chateaux have changed their land compared to the situation in 1855. For these reasons, some commentators believe that the Bordeaux classification system may represent more a marketing tool, if not a defiance of reality that can only damage Bordeaux's reputation (Lewin, 2009).
- 68 We believe that the Burgundy system, and its ability to accommodate and integrate the different appellations and hence reputations, is quite interesting. The idea of the pyramidal system, with lower quality wines and regions at the bottom, is further applied within the PDO. This allows a finer partition into different degrees of quality, where at the base there are the regional PDOs and at the top the Grand Crus. These latter can benefit from the common geographical reputation, probably because consumers can easily classify the wine tipology, and from their individual recognizability (only the top performers can use their only appellation) that signals higher quality. And lower performers can benefit from positive spillovers from the top performers, who made the wine famous in the first place. This system therefore appears a good way to align incentives and a suitable compromise to avoid conflicts between individual and collective reputations.
- 69 Some recent controversies in the wine industry in Italy seem to provide arguments to support the idea that the Burgundy system may be better than a more horizontal, i.e., relatively big and homogeneous, one. An illuminating case is the Chianti Classico PDO, where they recently introduced, not without discussion among different positions, a top wine tier, called Grande selezione, which represents a category within the appellation purportedly made for estate-grown wines.²² This seems an indication that further tiers at the top may be needed to take into account heterogeneity within the appellation. Indeed,

in the past few Chianti producers have chosen the lower category of *vin de pays* for their top quality wines (Krebiehl, 2013).

Individual reputations: grand cru or domaine?

- 70 In principle, a more pronounced vertical structure may be more suitable when quality differences, i.e., heterogeneity, are important. However, it is not clear how to determine and obtain the optimal degree of verticalization. The case of Burgundy, and of other PDOs that have followed suit on that idea, e.g., the Barolo PDO in Piemonte and its *menzioni geografiche aggiuntive*, that is the possibility to add the village and the subarea to the Barolo name (Rinaldi, 2012), shows that different tiers can be fruitfully accommodated into a collective (regional) system, where reputations can be shared at the regional, district, village or even plot level.
- 71 Other instances, for example the case of Valpolicella, show on the other hand that quality differences within the same PDO may be accommodated through the joint use of collective and private reputations: while the broader collective reputation may indicate some general aspects of the product, i.e., its typology, the private brand may be the market signal that the firm belongs to a top tier of quality.
- 72 The main difference is that establishing a private reputation may require more costly investments than being in the top tier of a collective one, and thus such private reputations may be easier to obtain for larger firms. So the same shape or structure of the collective reputation may induce more private brands in an industry with larger firms, which seems consistent, for instance, with the findings of Costanigro et al. ((2010; 2012)) in the case of the California wine industry.

Modelling choices

- 73 In a stylized model, it may be interesting to investigate the effects of the possible choices on quality and perceived quality (and hence on reputation), at the firm and collective level. The contributions we briefly reviewed are a good starting point to study these different cases, especially when modelling the interactions between private and collective reputations. In Fishman et al. (2008) the effect of the collective reputation is mainly based on the group history and not much is left for firms personal history. In other words, once belonging to a collective brand, the reputation of a firm depends almost exclusively on the performances of all the firms in the group. Other papers, notably Costanigro et al. (2012), consider both group and individual histories, but need to derive results using simulations.
- 74 To model the interaction between the different layers of reputation, the idea of the combination of group and individual reputation (past performances) might be useful. The question may be whether we can model a firm's choices, between moving out of the PDO, i.e., establish a private reputation, or moving up within the PDO. Allowing a finer partition of the PDO, using for example something equivalent to the Grand Cru mention, may induce (good) firms to remain within a particular PDO, especially the small ones that otherwise would have to sustain the costs of establishing a private reputation.
- 75 To conclude, Fishman et al. (2008) model the collective reputation with a separation model, since the group of high-quality firms establish the collective brand in order to separate from the low quality firms, i.e., from those outside the PDO. However, it seems

that within the brand itself there are also instances of imitation, when lower quality firms inside the brand, e.g., those using a village appellation, try to benefit from the reputation of higher quality climats, e.g., *Premiere Cru*, by extending the village name to include also the better *Cru* name as well, as seems to have happened in Burgundy.²³ Extending the Fishman et al. (2008) or other approaches to model the different incentives to separate from the lower quality and imitate the higher one may provide useful insights into these and related problems. In addition, more theoretical work needs to be done to model the interaction between collective and individual reputations.

Concluding remarks

- 76 Coordination of economic activities can be reached with different means, and one is collective reputation, quite common in agricultural markets. Indeed, given the demand for differentiated and quality products, the role of the retailing sector, and the recognition of regional brands by the policy-makers, in many situations agricultural producers share a brand, while remaining otherwise autonomous firms.
- 77 These collective endeavours allow agricultural producers to be more easily jointly recognizable, often helping them to reach consumers and sometimes to obtain better terms of trade within food chains. By spreading costs among many firms, collective brands are a means to get access to differentiated markets. Moreover, small firms - that otherwise would have problems establishing individual reputations - can democratically find a venue to niche markets. Indeed, when well managed, collective brands improve the competitiveness and the chances of survival for many small firms producing quality products.
- 78 However, collective brands are delicate organizations, that may improve competitiveness but that also face difficult choices ahead. New opportunities are emerging and will emerge, such as new markets, new technologies, changes in consumer demand, and new challenges from an ever evolving and demanding retailing sector. Seizing these opportunities may be seen as vital in the short-run, especially in periods with low market prices, but entering new markets or finding new outlets may have a subtle long-run negative impact on reputation.
- 79 We have discussed some of the problems that collective brands have to face if they want to seize market opportunities. With some collective brands, quality is often associated with traditional practices, and innovation is seen thus as a threat to these traditions. However, innovation can also bring forward better ways to interpret and enhance the value of the same traditions, and so banning innovation tout-court may make everyone worse-off. When choice is possible, it is probably better to share the collective reputation with similar firms, for instance by scientifically zoning the terroir. However, since this may imply restricting the production area, it may increase not only incentives to invest in quality but also rents for the included firms, to the detriment of other firms and consumers and an ensuing increase in conflicts between the brand and outside stakeholders.
- 80 On the other hand, when the group of producers within the collective brand is heterogeneous, conflicts emerge inside the group, as seen in the media. To align incentives among heterogeneous members, some brand configurations seem better fitting than others, but their suitability to different situations may need to be analyzed with a case-

by-case approach. Whether to take into account heterogeneity by a more vertically partitioned collective brand, e.g., the Burgundy's example, or with the interaction between the collective and private reputations, may depend on the industry structure at hand. With small firms, a more differentiated collective brand may be a good system to align all firms' incentives; on the other hand, in an industry with larger firms, private brands may naturally emerge as complements to collective brands.

- 81 The retailing sector, increasingly more concentrated, is also more demanding on upstream firms, thus asking for (but also providing) better services to consumers. Many collective brands may face difficult choices when requested, for instance, to supply their product for the retailer's private label. Whether seizing these new market opportunities is a good choice may depend on the overall effect on the consumer's perception of the collective brand, that is on the effect on collective reputation.
- 82 There are no easy-to-give answers or one single recipe to suggest for optimally behaving and reacting to evolving market and retailing needs. There are different issues to take into account and often multiple tools that can be used. Some cases were discussed, highlighting some common features that seem to be missing or not enough investigated in existing economic models. The aim should be the design of the optimal collective brand configuration to align different incentives and to reach an efficient and equitable compromise among the different actors in the food chains. Problems are more complex when firms are heterogeneous, but good practices exist and, together with the lessons from bad experiences, they can be used to make informed choices by the industry and the policy-makers.
- 83 These problems are important for the food industry, but also interesting for economists, and in this paper we have provided some suggestions for future research, both for understating industry and market equilibria and for supporting better informed policy-making. Policy-makers have so far recognised these collective endeavours in the agricultural sector. Good regulations may protect useful institutions or organizations, but they cannot isolate them from a changing world. To avoid being accused of unfairly protecting some firms, sectors, or parts of the world²⁴ without an agreed-upon and shared rationale, economists may help by investigating how collective reputations may assure quality products, better incomes for producers, but reasonable prices for consumers. We believe that the tools of the economics of reputation may help in exploring these and related issues.

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NOTES

1. Since the EU Reg. 479/2008, the different national AOC regulations on wines have been harmonised across all EU member states and now they are referred as protected designations of origins (PDOs) wines.
2. At the EU level, see the original reg. no. 2081/1992 and successive modifications (the last is reg. no. 1151/2012 for protected designation of origin (PDO) and protected geographical indication (PGI)). In 2010, there were 872 agricultural products protected with EU geographical indications (excluding wines), for a total sales value of almost 16 billions of euro (http://ec.europa.eu/agriculture/quality/schemes/index_en.htm).
3. In this paper we do not consider the literature on geographical indications, since most of it does not rely on models of reputation. Moreover, we review only published papers, i.e., no working papers, with an exception.
4. Here we consider firms' reputation, but the analysis can be extended to any seller or economic agent.
5. This section is based on Bar-Isaac and Tadelis (2008), which represents a useful introduction to this literature. A somewhat more technical and in-depth introduction is represented by Mailath and Samuelson (2006), while Mailath and Samuelson (2013) is a recent technical survey.
6. Beliefs evolve through a pre-specified Markovian process, not with an endogenous learning of quality like with Bayesian updating.
7. Castriota and Delmastro (2010) investigate the determinants of firm reputation taking into account individual and collective reputation. Using data for Italian wines, they show the positive effect of firm age, size, investments and collective reputation on individual firm reputation. They also show that in cooperatives membership size decreases reputation.
8. In all the models referred so far, quantity is the same for all firms and often normalized to unity.
9. Thus, the smaller the firm the less informed its customers are about its past quality. Small firms may therefore be unable to effectively establish individual reputations on their own and consequently will have little incentive to invest in quality. Here collective branding may come to the rescue (Fishman et al., 2008: p. 2).
10. Castriota and Delmastro (2010) find that brand reputation is increasing in the number of bottles produced but decreasing in the number of producers in the brand.
11. The court of Rennes was expected to decide on the case in the Fall 2014, after this article was written.
12. Sandro Boscaini, owner of Masi Agricola, explained that I'm not convinced that Valpolicella should be made outside the hills. The Classico region is historically one of small growers, but the rest is 90% co-ops, and they try to minimise the differences between the original area and the additional area. I'm not saying they can't make great wine. But [increasing the size of the AOC] has been a disaster for Valpolicella, driving it down in quality (Rand, 2013: 38).

13. The decision was probably not a surprise, given that The voting system, which is based on grapes production quota, has given an advantage to the bigger producers who were in favor of the abrogation (Costanzo, 2013).
14. One notable exception is Fleckinger (2007), which considers a Cournot oligopoly with endogenously differentiated experience goods where firms compete both on quality and quantity. The paper considers the case in which consumers know the *average* quality offered by a set of producers but not the quality of a given producer, i.e., a situation intermediate between the polar cases of perfect information and asymmetric information. It shows that competition increases total marketed quantity, but it decreases quality, and so it may be harmful to consumers (when the enforceable quality standards are low). Therefore, quality standards and competition are complementary under a collective name. Moreover, among one-instrument policies, quantity regulation is the best regulatory tool.
15. Probably for these reasons, in many cahiers des charges for PDO wines and cheeses, there is a limit on the yields per hectare or per cow, or there are other rules, e.g., no corn silage, that limit yields presumably to increase quality.
16. Some commentators in fact argue that extending the Champagne area to other villages may even lead to an increase in the quality of the production (see, e.g., Jefford, 2008).
17. This is for instance the case of Italy with the D.Lgs. no. 61/2010.
18. Saak (2012), using a model of homogeneous agents, moral hazard and imperfect public monitoring, considers two other mechanisms to discipline members of collective brands. The first is represented by social norms (peer punishment), to punish individual shirking detected through local peer monitoring. The second is represented by food scares, that is the loss of public confidence in the industry following isolated incidents of low food quality, which are efficient to the extent that they also *scare* producers to sustain industry-wide norms of compliance.
19. Results may explain also why it might be better to have monitoring or enforcement left to third parties, as established for example by the EU with the regs. no. 882/2004/CE, 1234/2007/CE, 607/2009/CE and 1308/2013/UE.
20. Using only the name of the grand cru without any other collective name is intended as a distinctive sign of quality.
21. Producers can use the name of the village and possibly the name of the climat but in smaller letters. Over time, the village denominations have started to add the name of their most well known cru, using then a two-component hyphenated name.
22. Notice that the Chianti PDO is already divided into the *Chianti Classico* zone, formed by the villages that were first included in the official production area, and the *Chianti* zone formed by villages that joined later on.
23. In Barolo, for instance, following a lawsuit the firm *Marchesi di Barolo* was recently allowed to add the Cannubi subarea name to the Barolo name on their wine label. However, the firm was not strictly from the Cannubi Cannubi location, which was the most well known cru (Rinaldi, 2012). Some commentators fear that the last verdict, which granted this firm the right to imitate, i.e., to be confounded with, a more recognized cru, may only be bad for consumers in the long run, who for the most part won't know that Marchesi di Barolo Cannubi's is from a particular, north-facing parcel of land (Suckling, 2013) and so not from the better known location (Rinaldi, 2013).
24. See, for instance, the recent controversies in the ongoing TTIP negotiations (e.g., Economist, 2014).

RÉSUMÉS

In agriculture, there are many instances of coordination obtained via collective reputation, such as geographical indications, marketing and processing cooperatives, membership in labels such as *Label Rouge*, etc. We discuss some of their problems in agricultural markets, where they are managed by otherwise independent firms through a democratic decision-process. After selectively reviewing the published literature, we highlight some relevant problems for the industry and for policy-making and we suggest some venues for future research.

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