The incentive properties of collective reputation

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Most practitioners recognize that the European viticulture system is based on regional appellations, i.e., Protected Denominations of Origin (PDOs), while the New World system is based on grapes varieties. PDOs (and the associated cahiers des charges) usually specify allowed grapes varieties, yields per hectare, production and processing technologies, and all practices that have traditionally permitted the association of a wine with a particular region. Indeed, the European system of using a geographical name is explained by the fact that the food product of the designated region presents characteristics of quality and originality that are the result of the geographical influences and/or the result of human factors (Bortozi 1995).

There are few studies investigating the working and the impact of regional names (for a recent survey see Bonroy and Constantatos (2015)). Most of these studies consider the economic impact – on behavior, market equilibria, and economic welfare - of the introduction of these collective labeling, comparing the market situation with and without such labels. However, to the best of our knowledge there are no studies comparing different AOC configurations in terms of equilibria and thus emerging welfare levels.

Considering the most well known cases in France, Burgundy and Bordeaux, the former has the most terroir-oriented design, since it is based on a very detailed classification of the land plots, the climats, in terms of quality potential. Moreover, the idea behind the Burgundy system is the pyramid, where at the base there are climats of lower quality, and at the top there are the best climats and hence wines. In Bordeaux, the classification system was initiated in the same year as in Burgundy, i.e., in 1855. It has however classified only the best estates (the chateaux), and it has been subject presumably to more criticism, changes, and failed reform attempts. In addition, many chateaux have changed their land compared to the situation in 1855, but kept the same position into the system. For some commentators, in Burgundy “the general validity of the hierarchy is well supported by the market” (Lewin 2010), while 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).

In this paper we analyze the behavior of heterogeneous agents (i.e., different wine producer types) under different AOC configurations. Agents may have different market outlets for their wine. They can sell via specialized outlets, e.g., hotels, restaurants, specialized shops, etc., where their quality is inferred perfectly by expert buyers. However, all wine producers need to sell part of their wine to the retailing sector, where consumers are less informed of the wine quality and where they have an average expectation of quality.

Using a Bayesian game, we compare the two most famous stylized situations, i.e., Burgundy and Bordeaux. In Burgundy, the production area is divided into different zones and micro-zones which are also ranked in terms of quality potential. The main features of the Bordeaux system, on the other hand, can be represented with a partition across sub-groups of relatively homogeneous producers though not ranked in terms of terroir quality. Thus, the main difference is that in Burgundy, there is a vertical partition into sub-groups, whereas in Bordeaux, it is rather horizontal. Building on the literature of collective reputation (Tirole 1996) and information provision in hostile/friendly environments (Fleckinger et al. 2015), we analyze the incentives for quality given by this distinction between the two AOC systems and study AOC architectures in terms of wine quality and efficiency of production.
We consider a set-up with heterogeneous wine producers that can invest in quality. Heterogeneity is modeled as different cost of producing high quality, which represents the potential of the different climates. Demand for wine comes from both expert buyers that can perfectly observe whether a given wine is of high or low quality, and consumers in a retail market that cannot observe quality but update their beliefs about expected quality of the wine offered in the retailing sector according to Bayes rule. Expert buyers purchase a certain quantity of high quality before the remainder of production goes to the retailing sector.

In a first step, we model expert demand as a uniform, exogenous probability of a high quality wine to be recognized as such and bought at a high price. The remainder of production, which consists of wines where producers invested in quality but that were not recognized as being of high quality, and those that are of low quality because there was no investment in quality, is sold in the retailing sector. Thus, in the retailing sector, quality is pooled. Whether there is vertical (Burgundy) or horizontal (Bordeaux) partitioning of the set of heterogeneous producers then determines how quality is pooled and thereby determines the incentives to invest in quality. In this type of environment, incentives for quality depend on the difference between the price of high quality and the pooled price. Free-riding is thus stronger when a higher fraction of producers produces high quality in the group, because this increases the pooled price. In particular, with vertical partitioning, free-riding of some intermediate types might be exacerbated, whereas investment incentives for other intermediate types might be increased compared to horizontal partitioning.

With horizontal partitioning, quality pooling in the retailing sector takes place across all types of producers whose wine is not detected as being of high quality. Then, there is a unique producer type such that all producers with lower cost invest in quality and producers with higher cost do not invest. Under vertical partitioning, quality pooling in the retailing sector is not across all types of producers but only across producers in a given subgroup, i.e. either in the low cost types (efficient) or high cost types (inefficient) subgroup. Then, investment may be such that within the subgroup of high cost types, the most efficient types invest in quality, whereas some even more efficient types that are in the subgroup of the low cost types do not invest. The latter occurs because these types freeride on the high quality provided by other low cost producers in their subgroup.

Comparing AOC systems, it can be shown that an optimally chosen vertical partitioning, i.e. Burgundy system, never performs worse in terms of wine quality and efficiency than a horizontal partitioning, i.e. the Bordeaux system. However, a badly chosen vertical partitioning may well lead to lower quality: Consider the case that the most inefficient producers do not invest in quality since their costs are anyways higher than the expected profit of high quality and therefore produce low quality wine under horizontal partitioning. Then, if a vertical partitioning creates only a small subgroup of inefficient producers who still all do not invest in quality, overall quality decreases: First, there is no change for the small, inefficient producer subgroup. However, in the other group, since producers are now pooled with less low quality producers and therefore relatively higher average quality, freeriding is amplified such that quality investment in this group decreases. Then, overall quality is reduced.

However, it can be shown that there exist distributions of producer types (climats) and probabilities of detection of high quality such that the optimally chosen vertical partitioning strictly increases quality compared to horizontal partitioning. Optimal vertical partitioning thereby divides producers into a small subgroup of efficient, high quality producers among which freeriding is low, and a relatively large group of intermediate and inefficient producers where intermediate producers still have incentives to invest in quality. Thus, a pyramid system like in Burgundy with a small group of excellent producers, like the grand cru and premier cru, and a large group pooling the rest, may lead to higher overall quality than a system horizontally dividing into sub-regions like the Bordeaux system.

This work is a first step towards design optimal collective reputation structures. An important extension we will analyze in subsequent work is how incentives are affected if the probability that a high quality product is detected is endogenous and depends on the AOC system.