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MANDATORY COOPERATIVES AND THE FREE RIDER PROBLEM: THE CASE OF SANTO WINES IN SANTORINI, GREECE

by

Constantine ILIOPOULOS

and

Irini THEODORAKOPOULOU

Agricultural University of athens, Greece

ABSTRACT: *This paper addresses the issue of how the institutional environment shapes cooperatives' ability to address the free rider problem and combat intra-organizational challenges. Particularly we focus on Santo Wines, a mandatory wine cooperative based on the island of Santorini, Greece; membership of local grape-growers in the cooperative is compulsory by law. We shed light on Santo Wines' evolution since its formation, the intensity of the free rider problem facing the cooperative as well as on available options in case it loses its mandatory status. We argue that the cooperative might be able to survive and succeed without its mandatory status under certain conditions derived from Ostrom's eight core design principles for the efficacy of groups.*

Keywords: cooperatives, free rider problem, mandatory membership, Greece

JEL classification: Q13, P13, P14, L13

Pflichtgenossenschaften und das Trittbrettfahrer-Problem: Der Fall von Santo Wines auf Santorin in Griechenland

Dieser Beitrag behandelt die Frage, wie das institutionelle Umfeld die Fähigkeit von Genossenschaften beeinflusst, das Trittbrettfahrer-Problem anzugehen und intra-organisatorische Herausforderungen zu bewältigen. Insbesondere richten wir den Fokus auf Santo Wines, eine Weinbauernpflichtgenossenschaft mit Sitz auf der Insel Santorin in Griechenland; die Mitgliedschaft örtlicher Weinbauern in der Genossenschaft ist gesetzlich vorgeschrieben. Wir betrachten die Entwicklung von Santos Wines seit seiner Gründung und die Intensität des Trittbrettfahrer-Problems, dem die Genossenschaft ausgesetzt ist, wie auch die verfügbaren Optionen für den Fall, dass sie ihren Status als Pflichtgenossenschaft verlieren sollte. Wir vertreten die Ansicht, dass es der Genossenschaft unter bestimmten, aus Ostroms acht Kern-Konstruktionsprinzipien für die Wirkungskraft von Gruppen abgeleiteten Bedingungen auch ohne den Status als Pflichtgenossenschaft möglich sein könnte, zu überleben und erfolgreich zu sein.

* E-mail: iliopoulosc@agreri.gr

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Cooperativas de afiliación obligatoria y el problema del "polizón": el caso de los Vinos Santo de Santorini (Grecia)

Este artículo trata sobre la manera en que el entorno institucional influye en la capacidad de las cooperativas para afrontar el problema del "polizón" y poner de manifiesto los desafíos internos de la organización. Los autores se interesan particularmente por los Vinos Santo, una cooperativa vinícola de afiliación obligatoria en la Isla de Santorini en Grecia. La afiliación es legalmente obligatoria para los viticultores locales. Se explica la evolución de los Vinos Santo desde su creación, la intensidad del problema del "polizon", al cual la cooperativa debe hacer frente y las opciones disponibles en caso de pérdida de su carácter obligatorio. Los autores piensan que la cooperativa puede sobrevivir y ser floreciente sin este estatuto obligatorio bajo ciertas condiciones derivadas de los ocho principios básicos de Ostrom para la eficiencia de los grupos.

Cooperatives à affiliations obligatoires et le probleme du passager clandestin: LE CAS DES Vins Santo a Santorin, Grece

Cet article traite de la façon dont l'environnement institutionnel influence la capacité des coopératives à affronter le problème du passager clandestin et à relever les défis internes à l'organisation. Les auteurs s'intéressent en particulier aux Vins Santo, une coopérative vinicole à affiliation obligatoire sur l'île de Santorin en Grèce. L'affiliation est légalement obligatoire pour les membres qui sont des viticulteurs locaux. Ils expliquent l'évolution des Vins Santo depuis leur création, l'intensité du problème de passager clandestin auquel la coopérative doit faire face et les options disponibles en cas de perte de son caractère obligatoire. Les auteurs pensent que la coopérative peut survivre et être florissante sans ce statut obligatoire sous certaines conditions dérivées des 8 principes clés d'Ostrom pour l'efficacité des groupes.

1 Introduction

Santo Wines is a wine cooperative based on the Greek island of Santorini. As a second-tier cooperative, its members are 14 local wine cooperatives. Both Santo Wines and its member-cooperatives represent a unique governance structure in European agriculture since they are mandatory by law; in other words membership of the island's grape producers in the cooperative is compulsory. Santo was founded in 1947 as a means 'to protect local tomato, fava bean, and wine production' (L. 359/1947). Over the years a handful of local farmers have challenged its legal status in Greek courts but without success. However, on June 20, 2013, the European Commission officially requested from Greece to 'modify its national legislation requiring all wine producers on the island of Samos to be members of the local wine cooperative and to deliver all their must production to the cooperative' (European Commission, 2013). The Union of Wine Cooperatives of Samos is also a mandatory, second-tier wine cooperative in Greece and thus the aforementioned request poses, for the first time, a significant challenge to Santo's leaders and members.

Given the above action of the Commission, it is expected that very soon local investor-owned wineries will ask the European Commission to extend this request to Santo Wines. Santo's success is presumably based on its unique, high-quality products and the strategies the cooperative has implemented during the last decade. Yet, as

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Mr Theo Demopoulos, Santo's CEO, explained in a personal communication on October 10, 2013, some of Santo's leaders fear that without having an instrument to prevent free rider behaviour, the cooperative might face severe challenges in the coming years. Others, though, believe that the mandatory status is no longer indispensible.

The free rider problem refers to the situation where a non-member receives benefits associated with the provision of public goods by the cooperative (e.g., higher commodity prices), but avoids becoming a member—and thus eschews contributing to the costs associated with this provision, which are incurred by members alone. A similar problem occurs when a member stops patronizing the cooperative temporarily when she finds it to her best interest (Iliopoulos, 2009). In the era before the cooperative was founded, organizing collective action of more than 3,000 local producers with tiny farms was an insurmountable task. Investor-owned processing firms would offer higher prices to non-member-farmers of non-mandatory cooperatives formed before Santo thus threatening member commitment to the cooperative. Organizational means to ameliorating the free rider constraint were largely unavailable at that time as relevant scientific knowledge was developed only after the mid-1960s and in very different institutional and cultural settings (e.g., Olson, 1965; Ostrom, 1990).

This paper addresses the issue of how the institutional environment shapes agricultural cooperatives' ability to address the free rider problem. Particularly we focus on mandatory cooperatives as a special type of traditional agricultural cooperative. We adopt Ostrom's core design principles for the efficacy of groups in analysing the necessary conditions for self-regulated collective action that addresses the free rider problem (Ostrom, 1990).We use Santo Wines as an example of mandatory cooperatives in order to study whether and in which ways the mandatory status enables a cooperative to combat intra-organizational challenges. Given the aforementioned recent developments, we also examine Santo Wines' options in case it loses its mandatory status. We argue that after almost seven decades the cooperative might be able to survive and succeed without its mandatory status. Further, we identify other factors, for example public policy support measures, as important determinants of Santo Wines' success.

The paper is structured as follows. The next section provides an overview of solutions to the free rider issue adopted by agricultural cooperatives. Sections 3, 4, and 5 give background information on mandatory agricultural cooperatives in Greece, and the wine industry in Greece and Santorini, respectively. Section 6 provides an analysis of Santo Wines' evolution, performance and strategies adopted, ownership structure, conditions that made government intervention back in the 1940s necessary, and discuss whether such intervention is meaningful today. Section 7 concludes the paper and outlines mechanisms and strategies that Santo may use to minimize free riding behaviour in the post-mandatory status era.

2 Solutions to the free rider problem in agricultural cooperatives

The free rider problem has been identified and analysed by various academic disciplines, including philosophy, economics, sociology, political science and anthropology. Despite the different emphases, approaches and underlying assumptions, all these disciplines share common objectives, namely, to determine and articulate the basis of the

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problem and propose and test the effectiveness of alternative solution mechanisms. A review of this vast literature is far beyond the scope of this paper (see Lichbach, 1996, for probably the most complete review of the free rider literature thus far). Instead we focus on briefly reviewing the academic literature on solutions to the free rider issue and, particularly, solutions adopted by agricultural cooperatives.

Numerous alternative instruments to address the free rider problem are proposed in the academic literature. They can be usefully grouped in four generic solutions, namely, market, community, contract, and hierarchy solutions (Lichbach, 1996).

Market solutions address the free rider issue by increasing the benefits or lowering the costs of collective action, by reducing the supply of the public good, restricting the exit of co-operators (Hirschman, 1974), or changing the type of public good (Hardin, 1982; p. 82). Among the most commonly used market solutions by agricultural cooperatives are the adoption of a base capital plan, the requirement for high upfront equity capital by members, the issuance of transferable and appreciable delivery rights, the adoption of defined membership, and the creation of high switching costs for member-patrons.[1] Most of these solutions have been adopted by new generation cooperatives in the US (Harris et al., 1996).

Community solutions view social relationships among potential co-operators as facilitators of collective action. They address the free rider problem by using common knowledge to overcome mutual ignorance. This approach is based on the assumption that individuals who expect all others to contribute to a public good will contribute as well (Schelling, 1978). Agricultural cooperatives adopt several related solution instruments such as member relations programs and constant communication to member-patrons of operational issues and challenges. Community solutions also use common values to overcome pecuniary self-interest. This approach refers to shared values as a means to convincing group members to behave contrary to a 'simple, hedonistic, individual calculus of costs and benefits' (North, 1981; p. 53). Agricultural cooperatives implement this approach by promoting their history and building their image.

Contract solutions ameliorate the free rider problem through participants who devise their own rules, institutions, and processes to avoid free riding, shirking, and opportunistic behaviour. The implied voluntary agreements are formulated based on such principles as fairness, justice, equity, and efficiency (Hardin, 1982). Agricultural cooperatives use contract solution instruments such as the formation of subsidiaries and joint ventures with other cooperatives or IOFs, and marketing contracts with members.

Finally, hierarchy solutions focus on the existence of institutions created to manage society or a subgroup of society members. In these approaches a deliberate attempt to solve the free rider problem is made by some pre-existing organization of potential co-operators (Lichbach, 1996; Alchian and Demsetz, 1972). Agricultural cooperatives adopt several hierarchy solutions such as marketing orders and defined volume in processing activities. Government provision of public goods or government intervention to address the free rider problem faced by a subgroup of citizens also represent hierarchy solutions that have been studied extensively by Public Economics (e.g., Buchanan, 1965; Atkinson and Stiglitz, 1980; Auerbach and Feldstein, 1985; Gerber and Wichardt, 2009).

1 All solution mechanisms adopted by agricultural cooperatives are from Cook and Iliopoulos (1998).

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The above solutions to the free rider problem share a number of common features: (1) either implicitly or explicitly, they recognize the importance of institutions in solving the free rider problem; (2) each generic or specific solution is fundamentally incomplete, as each simply generates a second-order free rider problem (Lichbach, 1996; p. 207). That is, the implementation of a solution is a new collective good, which requires the contribution of group members in the same fashion as the initial good; and (3) all solutions have some fatal flaws that make them unstable and thus threaten their implementability, leading to the need to adopt voluntarily multiple, complementary solutions (Iliopoulos, 2009).

A plethora of theoretical, experimental and empirical studies have provided salient evidence that self-regulation to combat the free rider constraint is feasible but it is organized only under certain circumstances (Poteete et al., 2010). This line of research is largely associated with the pioneering work of the late Elinor Ostrom (2009 Nobel in Economics). Ostrom proposed a set of eight design principles, which determine the efficacy of groups formed to self-manage common pool resources (Ostrom, 1990):

(1) Clearly defined boundaries: The identity of the group and the boundaries of the shared resource must be clearly delineated. This is the first step in organizing collective action and in the past scholars suggested that this is the most important condition for the efficient organization of groups. Today, however, it is recognized as an important but not the only necessary condition that should be met in order to self-organize the management of a common-pool resource.
(2) Proportional equivalence between benefits and costs: Members of the group must negotiate a system that rewards members for their contributions. High status or other disproportionate benefits must be earned. Unfair inequality poisons collective efforts. What is crucially important is that those who receive the highest proportion of the benefits also pay the highest proportion of the costs associated with this appropriation. As a result, the perseverance of the resource is taken into account when making individual appropriation decisions.
(3) Collective-choice arrangements: Group members must be able to create at least some of their own rules and make their own decisions by consensus. People hate being told what to do but will work hard for group goals that they have agreed upon. Using this principle enables institutions formed to manage a common-pool resource to tailor their rules to local circumstances. Groups of resource users who design their own common-pool resource institutions characterized by these first three principles are closer to devising an efficient set of rules than those who do not, given that the costs of rule modification are kept as low as possible. Gaining compliance to the rules is another story, though, which makes investment in monitoring and sanctioning very important.
(4) Monitoring: Managing a commons is inherently vulnerable to free-riding and active exploitation. Unless norm-abiding members of the group can detect these undermining strategies at relatively low cost, the tragedy of the commons will occur.
(5) Graduated sanctions: Transgressions need not require heavy-handed punishment, at least initially. Often gossip or a gentle reminder is sufficient, but more severe forms of punishment must also be waiting in the wings for use when necessary. In most robust common-pool resource institutions, the participants themselves undertake monitoring and sanctioning. It is not external but internal

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enforcement that boosts commitment in these cases. According to Ostrom (1990, p. 95), common-pool resource appropriators create their own internal enforcement to (1) deter those who are tempted to break rules and (2) assure quasi-voluntary compliers that others also comply (Levi, 1988). Making sure that the costs of monitoring and sanctioning are low and the associated benefits are high crucially facilitates internal enforcement. However, these costs and benefits are highly influenced by the characteristics of the particular rules adopted and vary by context (Ostrom, 1990, p. 96). In self-managed collective action institutions, participants design at least some of their own rules and so can learn from experience to craft low-cost, high-benefit rules; that is, enforceable.

Another very important determinant of rule enforceability is the availability of relevant information. Particularly when participants agree to follow a set of rules, so long as most of the others follow the rules, access to information on compliance rates becomes critical. In repeated settings participants who undertake monitoring activities obtain valuable information for themselves that can improve the enforceability of rules. However, the compliance rate that must be maintained to ensure that the commitment to comply will continue over time differs from setting to setting and depends on economic and other circumstances within the resource system (Ostrom, 1990, p. 99).

(6) Conflict resolution mechanisms: It must be possible to resolve conflicts quickly and in ways that are perceived as fair by members of the group. Although the adoption of conflict-resolution mechanism is not a sufficient condition for the self-maintenance of enduring collective action institutions, it is nonetheless a necessary one.
(7) Minimal recognition of rights to organize: Groups must have the authority to conduct their own affairs. Externally imposed rules are unlikely to be adapted to local circumstances and violate principle 3. This violation represents a recurrent theme in case studies on common-pool resources, in which governments fail to recognize the efficiency of informal, community-created and enforced rules and replace them with formal rules that do not take into account local circumstances.
(8) Appropriate coordination of larger groups: For groups that are part of larger social systems, there must be appropriate coordination among relevant groups. Every sphere of activity has an optimal scale. Large-scale governance requires finding the optimal scale for each activity and appropriately coordinating the activities, a concept called polycentric governance (McGinnis, 1999). A related concept is subsidiary, which assigns governance tasks by default to the lowest jurisdiction, unless this is explicitly determined to be ineffective.

In recent research Ostrom and her colleagues show that these core design principles can be generalized and applied to any type of social dilemma (Wilson et al. 2013). Thus they can be used in assessing the ability of a group to address the free rider problem. As shown in the analysis of Santo Wines, most of the conditions implied by these principles were not met back in 1947 when the mandatory cooperative was formed, meaning that, at that point of time, self organizing to combat the free-riding constraint seemed less feasible.

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3 Mandatory cooperatives in Greece

Mandatory agricultural cooperatives were first formed in the early 1930s, when national laws enabled their establishment (Klimis, 1985). Under this legislation, the sale of particular agricultural products from a well-defined region through these cooperatives is mandatory for all producers. As a result, these cooperatives can successfully address free rider issues, control the supply of a product and thus improve their positioning in their respective food supply chains.

According to their main function, mandatory cooperatives belong to one of two distinct types. The first type includes cooperatives formed to ensure property rights over, or the rational use of, agricultural land, forests, etc. The second type refers to cooperatives formed to address market failures in the markets of specialty products or products of particular geographic regions (Vavritsa, 2010). Mandatory cooperatives are in many ways similar to commodity marketing boards, which were formed in many countries between the two world wars (e.g., Canada, USA, UK, Australia, and New Zealand). Both represent statutory marketing arrangements established to protect producer income, reduce income and price volatility, and provide equal opportunities and returns among producers (Nayga and Rae, 1993). Also both represent a public policy response to the strongly held belief of farmers that they could raise their incomes by producer-controlled statutory marketing institutions (Rae, 1978). Like marketing boards, mandatory cooperatives' formation has been based on the belief that it is more equitable to allow producers to control the other players in their food supply chain than the other way around (Nayga and Rae, 1993).

Presently, four second-tier mandatory agricultural cooperatives are active in Greece. Some of them are among the most successful agricultural cooperatives in Greece (Bijman et al., 2012). The Union of Agricultural Cooperatives of Thiras' Products, known as Santo Wines, is one of them. Wine has traditionally been the Santo's most important product.

4 Background on the Greek wine industry and cooperatives

Wine is an important part of the Greek culture and has been a major element of the Greek diet for ages. The total cultivated area devoted to viticulture is around 70,000 ha, while annual wine production is around 4 million hectolitres. Since 2009 domestic wine consumption has been decreasing (ICAP, 2010, ELSTAT, 2012). According to data obtained from the Hellenic Statistical Authority there has been a significant decrease in national wine sales by almost 11% between 2009 and 2011. Not surprisingly, the recent economic crisis-induced-reduction of the disposable income in Greece has been responsible for the rise in the demand for lower-quality, bulk wine. A key characteristic of the domestic wine industry is that approximately 65–70% of the total production is sold by either wineries or retail stores not as bottled wine but in bulk. Non-bottled wine is sold directly to consumers or to large retailers in 5, 10, or 20-litre packages, under generic labelling. The Greek wine industry is organized around 4–5 large firms, which hold the lion's share of bottled wine sales in the domestic market (64% in 2001; 47% in 2007), and numerous small and medium size wineries. The latter either produce

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both bulk and bottled wine or have made significant investments towards producing top-quality, bottled wines. Forty out of a total of 720 wineries are wine cooperatives that contribute more than 20% in the industry's total turnover.

The wine supply chain includes several different types of suppliers with varying degrees of negotiating power. On the other hand, the final producer price depends on the quality of grapes. However, grape quality is assessed by wineries, which, in some cases act as local monopsonies. With a few exceptions, vineyards are still in the hands of farmers rather than wine producing firms. Contracts and horizontal relationships with wine makers as well as cooperation with other growers could decrease uncertainty and leverage the negotiating power of grape producers (ICAP, 2010).

On the demand side of the wine supply chain, the large retailers, wholesalers and specialized liquor stores usually exert their power over the wine supply chain to meet their needs. Their influence over the wine supply chain is manifested in various ways, such as low prices paid to suppliers, organization of numerous activities along the wine supply chain, and direct or indirect determination of the volume of sales. Small wineries are particularly challenged because they do not have the leverage associated with volume that the larger wineries have. As a result, the market power of a buyer over a small winery can be viewed as relatively strong. However, the recent economic developments along with the global economic crisis have changed consumers' recreation and consumption habits. So, as more and more consumers reduce their nights out, wine producers are shifting their strategy towards sales to supermarket chains.

With the exception of 4–5 companies, most of the wineries are small, family-operated businesses. Yields are much lower when compared to those in France and Italy, mainly due to low rainfall. Most of the vineyards are small, often on hillsides, and require a lot of labour, as they are usually hand-tended. All of these structural characteristics raise production costs for Greek wineries and, as a result, they find it difficult to compete with low-cost wines from other countries.

5 The Santorini wine industry

The island of Santorini has a long history in wine making that goes back to ancient times (Figure 1). Grape growing used to be one of the main sources of agricultural income. Wine production on Santorini, with the peculiar local ecosystem created by successive explosions of the local volcano, is based on indigenous grape varieties, with low productivity and high quality of produced wine. There are still vineyards more than 100 years old that retain their original rootstocks. The demanding viticultural practices required to maintain the vines, and the fact that Santorini is one of the world's premier travel destinations, have made wine-making an unpopular economic choice for producers of the island. Against these odds, however, the wine industry in Santorini still remains vibrant. Even more, recently an increase in land devoted to viticulture has been observed highlighting a return to wine making as a significant source of income.

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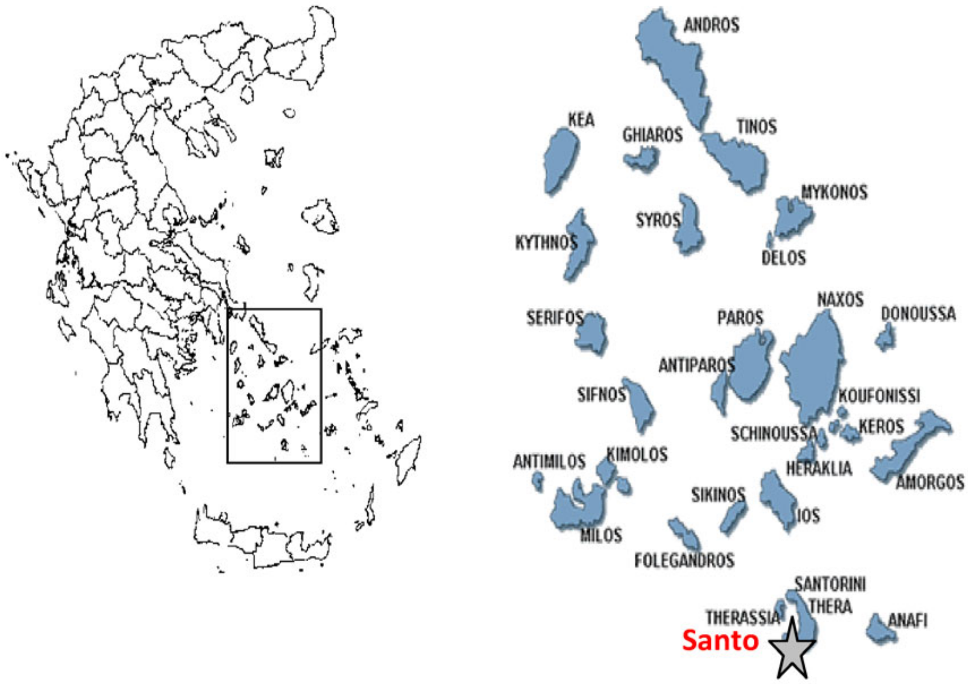

Figure 1 – Map of Greece and the island complex (Cyclades) where Santo Wines is located.

6 The Santo Wine cooperative

6.1 History, mission, and evolution

The Union of Wine Cooperatives of Santorini, or Santo, was founded in 1947 as a mandatory cooperative. Santo's mission has always been twofold: 1) to safeguard local producers against the opportunistic behaviour of free riding farmers and Investor Oriented Wineries (IOW); and 2) protect the island's unique grape varieties, vineyards and landscape. Its members are 14 mandatory, first-tier cooperatives, which represent approximately 2,500 farmers; that is, all of the island's producers (Iliopoulos et al., 2012). The total vineyard area covers around 1,300 hectares. Santo manages 60% of the local grape production, which corresponds to 18,000 HL per year. Seventy per cent of its production is destined for packaged/bottled wine while the remaining 30% is sold in bulk. In 2009 Santo's total sales amounted to 6.3 million €, a figure which corresponds to a market share of 2.1% of the total wine market in Greece. The remaining 40% of the local grape production is absorbed by local IOWs. It has to be noted at this point, that some of the local IOWs have their own vineyards and, therefore, their owners are obliged to become members of the cooperative and subsequently deliver part of their production to the cooperative as well. However, Santo has silently agreed not to exercise this right and therefore, although typically members of Santo, as grape growers, IOWs process all of their own production.

The mandatory character of the cooperative is described in national legislation and is further manifested in the cooperative's bylaws; membership in the cooperative is compulsory for Santorini farmers, who are obliged to deliver at least 25% of their yearly production to the cooperative. Santo Wines receives the raw material from its

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members, processes the grapes, bottles and markets the wine. The earnings that are accumulated at the end of each year are distributed to members while part of them may enter a special, non-taxable reserve in order to finance future investments. According to the cooperative law a minimum of 10 per cent of each year's earnings must be kept in a reserve until an amount equal to members' equity has been accumulated. The decision on how to distribute the remaining earnings is made by the board of directors. Due to its special nature and organizational structure, Santo manages to absorb a large part of market and price fluctuations and operates as a safety net for its members.

In addition to the processing and marketing activities, Santo offers its members an integrated set of products and services, including input supplies, administrative support, and technical assistance. Under the Santo brand name, the cooperative also processes, markets, and exports a variety of locally cultivated and processed quality products, such as tiny tomatoes, fava beans, capers and caper leaves.

6.2 Competition and cooperation on the island

Apart from Santo, 13 IOWs are based on the island. Santo is the price leader, while IOWs act as price takers; Santo sets the price and IOWs have to pay at least this price in order to buy grapes from farmers. At the same time IOWs have to offer a premium price to attract enough quantities and compensate wine growers who have invested in producing top-quality grapes. In the words of a local wine maker: 'We, the investor-owned wineries, have to pay a 25–40% mark-up to grape growers so that we make sure we stay in the market.' Cooperative ideology remains strong on the island and, according to representatives of IOWs; cooperative leaders often use it as a strategic tool against competitors. The cooperative in its countervailing power role accepts all the produce brought-in by members irrespectively of the quality delivered. Then, grapes are graded according to strict quality standards and the process yields an array of different products, ranging from bottled, top-quality wines to medium-quality wines delivered in 5, 10 and 20-lt packages, to vinegar and other grape and wine by-products.

6.3 Strategy and performance

After decades of trial-and-error, in the last twenty years Santo carefully considered its options and chose to be primarily active in the following business lines:

- Wine: PDO wine, bottled and bulk.
- Locally cultivated gourmet specialty products.
- Wedding tourism.

According to the cooperative's CEO, the main results Santo seeks to achieve are a stable farmers' income and the sustainability of the local wine industry in the long run. In order to get there Santo uses the following four main strategic vehicles:

- Internal development (e.g., improve infrastructure, human capital).
- Pooling. The cooperative uses income generated from other products and service provision to finance the expansion of the wine business. Given that most, if not all

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Table 1 – Santo's financial ratios, selected years

	Year			
Financial Ratio	2001	2002	2008	2009
Liquidity ratio	0.811	0.963	2.440	1.747
Leverage ratio	0.792	0.738	0.435	0.319
Long-term debt to equity	100.93	38.88	1.52	15.38
Return on total assets	0.005	0.311	0.214	0.184
Return on allocated equity	0.224	8.072	25.261	25.897
Value added to sales index	31.12%	34.38%	37.93%	38.88%
Sales evolution	3,115,160	3,251,587	6,467,102	6,296,053

of the members produce a combination of these products, pooling does not seem to create conflicts among members due to cross-subsidization. This is unlike in cases highlighted in the academic literature, in which cross-subsidization gives rise to member-commitment problems. However, in the reported cases, the competing subgroups of members are characterized by high intra-group homogeneity of interests but extremely high inter-group dissimilarities (e.g., Cook and Burress, 2009).

- A single brand name for the full array of Santo's products.
- Joint ventures with well-established, successful IOFs to take advantage of their retail network and ensure a constant presence in major consumer markets. An example of such a joint venture is the recent agreement with Tsantalis, a major wine maker and retailer in Greece (Apostolou, 2014). The latter agreed to distribute Santo's wines in the domestic and international markets exclusively. This represents a major shift towards a more collaborative and market-oriented business strategy, since in the past the cooperative had been the own distributer of its products.

Over time, Santo has managed to achieve its goals, that is, to enhance the income of its member-patrons and provide local communities with employment opportunities while at the same time preserving the unique but highly sensitive natural environment of the island. This success is partially depicted in the calculated financial ratios (Table 1). As shown, these indexes were calculated for years 2001, 2002, 2008, and 2009. This selection was dictated by two events. First, in 2002, following a General Assembly decision, member equity was doubled. Second, in 1998 and 2005, under the EU's support schemes[2], the cooperative modernized its winery and improved its winemaking capacity. Therefore, observing financial ratios during these years facilitates a better understanding of Santo's performance over time. For example, from 2001 to 2009 Santo more than doubled its ability to pay-off its short-term debt obligations (liquidity ratio); it decreased its long-term debt as a percentage of equity by more than 84 per cent (long-term debt to equity ratio); it increased returns to equity provided by members by more than 11,000 per cent; while the cooperative increased the value it adds to its sales by 24.9 per cent (value added to sales index).

2 European Commission Regulation (EC) No 866/90, and European Commission Regulation (EU) No 1257/99.

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Table 2 – Ostrom core design principles for the efficacy of groups applied to Santo

Core Design Principles	Before Mandatory Status	After Mandatory Status
1. Clearly defined boundaries. The identity of the group and the boundaries of the shared resource are clearly delineated.	YES	YES
2. Proportional equivalence between benefits and costs. Members of the group must negotiate a system that rewards members for their contributions. High status or other disproportionate benefits must be earned. Unfair inequality poisons collective efforts.	NO	YES
3. Collective-choice arrangements. Group members must be able to create at least some of their own rules and make their own decisions by consensus. People hate being told what to do but will work hard for group goals that they have agreed upon.	NO	YES
4. Monitoring. Managing a commons is inherently vulnerable to free-riding and active exploitation. Unless norm-abiding members of the group can detect these undermining strategies at relatively low cost, the tragedy of the commons will occur.	NO	YES
5. Graduated sanctions. Transgressions need not require heavy-handed punishment, at least initially. Often gossip or a gentle reminder is sufficient, but more severe forms of punishment must also be waiting in the wings for use when necessary.	NO	YES
6. Conflict resolution mechanisms. It must be possible to resolve conflicts quickly and in ways that are perceived as fair by members of the group.	NO	YES
7. Minimal recognition of rights to organize. Groups must have the authority to conduct their own affairs. Externally imposed rules are unlikely to be adapted to local circumstances and violate principle 3.	YES	YES
8. For groups that are part of larger social systems, there must be appropriate coordination among relevant groups.	NO	YES

Despite their usefulness in understanding Santo's economic performance, financial indicators should be used with caution. While successful in providing an accurate picture of an IOW's financial performance, many financial ratios are not suitable to assess a cooperative's performance or make inferences about its overall financial condition. In many cases, the choices of cooperative managers are dictated by constraints not faced by IOWs or competencies not available to IOWs. Furthermore, a cooperative's capacity to create value for its members should also be assessed in relation to other issues, some of which are not easily quantifiable and thus are not depicted in standard financial statements (e.g., jobs created for farmers' children, sustainability of the island's wine production, etc.).

6.4 Ownership and free riders

Santo is a special type of traditional cooperative. As a traditional agricultural cooperative, its residual claimant rights are distributed exclusively to farmer-members

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on the basis of patronage volume. Residual control rights are also distributed only to members who make all decisions on the basis of the 'one-member, one-vote' principle (Chaddad and Cook, 2004). However, membership in Santo is mandatory. This organizational feature was imposed by law as a means of addressing the free rider problem, which challenges the survivability of many agricultural cooperatives, particularly during their formation (Cook, 1995; Iliopoulos, 2009). Next, we apply Ostrom's core design principles for the efficacy of collective action groups to the Santorini wine supply chain before and after Santo's formation in 1947 but also today just before the mandatory status of the cooperative is lost. Our goal is twofold: 1) to examine whether the conditions, implied by Ostrom's theoretical framework, were met before 1947 and thus whether government intervention to address the free rider problem was justified, and 2) to consider whether these conditions have changed after Santo's formation and, particularly, if they are met today and so the loss of mandatory status will not pose a threat to Santo's ability to survive in the future.

(1) *Clearly defined boundaries*: In the case of Santorini's grape growers, the resource under examination is the competitive market for their high-quality, local produce. Before 1947 this market was neither well defined nor competitive as local middlemen, wholesalers and processors would offer slightly higher prices to would-be free riders in order to impede collective action groups to form and survive (Dimopoulos, 2012a; 2012b). The formation of Santo and its mandatory status enabled local producers to act collectively to protect their farm income.

One measure of the free rider problem in agricultural cooperatives is the percentage of grape growers that are members of the cooperative (e.g., Iliopoulos, 2009; Olson, 2009). However, it is also important to know whether these members deliver a significant part of their produce to their cooperative. Given the mandatory status of the Santorini wine cooperatives, 100% of the island's grape growers are (mandatorily) members of Santorini cooperatives. Further, these farmer-members deliver more than 60% of their produce to their cooperative (Dimopoulos, 2012b). The combination of these two measures is used in this paper as a proxy for the intensity of the free rider problem faced by Santo and its member-cooperatives. A key question, though, is whether Santo will observe a decrease in its membership due to the loss of the mandatory status. Some of Santo's leaders seem to perceive this development not as a threat (Dimopoulos, 2012a; 2012b). Yet, it is questionable whether this assessment represents wishful thinking or is based on knowledge of policies designed by Santo to minimize free riding in the post-mandatory status era.

(2) *Proportional equivalence between benefits and costs*: As previously explained, local middlemen, wholesalers and processors in the pre-1947 era used their market power to poison farmer-led collective efforts by extracting abnormal profits from poor, largely uneducated smallholders (Klimis, 1985). Their market power was mainly due to the access to risk capital they could secure because of their businesses' size and access to information about markets and prices not available to farmers. Therefore, proportional equivalence of benefits and costs was out of question before Santo's formation. The government-enforced mandatory status of Santo constrained these supply chain actors' ability to benefit to the detriment of local farmers. Santo's formation as an agricultural cooperative with its

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democratic governance structure (one-member, one-vote, allocation of surpluses in proportion to patronage, etc.) clearly indicates that principle 2 was met only after Santo was formed.

Santo's current much stronger market position and diversification strategy may act as a barrier to IOW's attempts to steal Santo's members. Yet, this is a highly debatable issue and all available evidence suggests that probably Santo needs to invest in designing and implementing mechanisms and strategies to make membership in Santo more attractive to local farmers. A major drawback towards this direction is that many farmer-members view farming as a supplementary activity since they make most of their annual income from tourism.

(3) *Collective-choice arrangements*: Prior to 1947 Santorini farmers would not even consider joining a self-organized collective effort, let alone creating their own rules for the organization and coordination of local food supply chains (Dimopoulos, 2012a). After Santo was formed, however, its members were able to negotiate and adapt their cooperative's strategies to both the legislation and the needs of the local wine supply chain. With respect to the latter, one should notice that while the legislation permits Santo to demand that at least 25% of its members' produce be delivered to the cooperative, Santo has silently accepted a lower percentage so that local IOWs can secure access to grape supplies, too. This informal institution seems to be critical in maintaining IOWs happy by facilitating depressurization. Maintaining and even increasing the value that Santo creates and distributes to its members in the post-mandatory status era is a prerequisite for addressing the free rider problem in the future.

(4) *Monitoring*: Before 1947 monitoring of local farmers, processors and other wine supply chain stakeholders was not feasible. Local farmers were facing a severe free rider constraint as well as basic subsistence problems while the government had to deal with all kinds of problems resulting from the civil war. On the other hand, middlemen, wholesalers and processors were using strategic information not available to farmers and other means such as the provision of incentives to farmers so that they free ride on the efforts of their colleagues who attempted to organize collectively (Klimis, 1985; Dimopoulos, 2012a; 2012b).

Following the passing of the mandatory-status legislation in 1947, Santo took an active role in monitoring free riders; the low-cost of monitoring facilitated Santo in performing this role as predicted by Ostrom (1990, p. 96). However, the very enforcement of this legislation acted as a threat to would-be free riders that now had to join the cooperative mandatorily (Dimopoulos, 2012b). Today no farmer-member free rides unless Santo allows them to sell part of their produce to local IOWs. As a result, very few frictions take place between Santo and such IOWs. Whether this situation will be sustainable after the local grape market is opened to free competition remains to be seen. More competition is expected to lead to higher efficiency but, on the other hand, intervening in a local system that seems to work without major frictions may have negative consequences not known *ex ante*.

(5) *Graduated sanctions*: Prior to Santo's formation sanctions for free riders were not enforced in any way. Subsequently, while primarily Santo performed monitoring,

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sanctions to free riding farmers or other wine supply chain participants were imposed by governmental agencies based on the island, which had a relatively good knowledge of local conditions. Given this form of sanction enforcement, quasi-voluntary compliance did not play an important role. Moving from this scheme of monitoring and sanctioning to a self-enforced one, in which compliance to rules and member commitment are not threatened by free riders and outside interventions, is a step that Santo and its members have to make in the near future. Whether this would be feasible is ambiguous. Santo's success during the last years might serve as a stepping-stone in reaching this goal.

(6) *Conflict resolution mechanisms*: No formal mechanism for discussing and resolving infractions was available to Santorini before Santo's formation. Only appealing to the court partially acted as such a mechanism but civil war conditions and the difficulty of proving free riding behaviour at the court made this mechanism highly inefficient. By making membership in Santo compulsory the government put in place a relatively low-cost conflict resolution mechanism in the sense that the threat of imposing penalties to free riders was sufficient in preventing them from acting against the common interests of the group. Santo's leaders argue that in the short run they would not expect to experience problems in negotiating with farmer-members and local IOWs and reaching an agreement on common rules and mechanisms to resolve any conflict that might arise (Dimopoulos, 2012a). Yet, they are less certain about the prospects of this happening in the medium to long run when new IOWs may enter the Santorini wine industry.

(7) *Minimal recognition of rights to organize*: Santorini farmers did have the formal right to organize by forming agricultural cooperatives since 1914 when the first cooperative incorporation law was passed in Greece. However, in the late 1940s the civil war has resulted in low trust among farmers and the erosion of local social capital. Furthermore, relevant technical expertise was largely unavailable at that time making the formation of an agricultural cooperative very difficult if not infeasible. The farm population was extremely poor and uneducated, thus unable to understand the medium to long-term benefits of collective entrepreneurship. As mentioned above, alternative institutional means of addressing the free rider problem were either unavailable or not known to policy makers. Previous attempt to start a local multipurpose cooperative have failed (Klimis, 1985; Tzortzakis, 1952, p. 115). Following the civil war, PASEGES, the umbrella organization representing all agricultural cooperatives of Greece, has designed and implemented several technical support programs that have resulted in the formation of numerous agricultural cooperatives in other regions of the country. However, such programs were not available in 1947, and due to their nature they create positive effects only in the long run. The mandatory-status legislation decisively empowered local farmers to form Santo.

(8) *Coordination among larger, relevant groups*: Such type of coordination was out of question before 1947. Subsequently the federated cooperative structure adopted by Santo made the efficient coordination at the village and island level feasible. Today, due to significantly improved conditions (e.g., in transportation and storage) the federated structure may not be the optimal form of organization any more. Table 2 summarizes the above analysis.

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7 Concluding remarks

While statutory marketing boards have been abolished in most English-speaking countries during the last decades, mandatory cooperatives, like Santo Wines, still exist in Greece. Given the European Commission's request, one crucial question demands an informed answer: to what extent is Santo's success a result of its mandatory status? A definitive answer would require a combination of economic and legal expertise. Yet, the analysis presented in this paper suggests that during the last 25 years, when Santo implemented a successful, market-oriented strategy, its mandatory status might have not been the most decisive contributor to this success.

Furthermore, the cooperative has managed to deal with the free-rider problem over the years by creating the appropriate environment. As mentioned above, in order to address the free rider constraint, a collectively owned organization has to: (1) create and foster formal and informal institutions that promote collective action for achieving legitimate collective goods or avoiding collective 'bads,' and (2) combine more than one solutions to avoid the incompleteness of individual solutions. It seems that Santo has exerted significant efforts to meet both conditions. Although originally the cooperative was granted a mandatory status by law, as a means to overcome the free rider problem, it becomes obvious that Santo's management has chosen not to rely solely on the mandatory status in order to deal with free riding. Cooperative ideology has been gradually built and still remains strong on the island. As farming on the island is both multidimensional and multifunctional, producer-members receive support by the cooperative in many levels. Support to members is assured through the large investments in infrastructure and brand name building that create value and safeguard farmers' income. These large investments are combined with strong interpersonal relationships between member-patrons and management, which foster members' appreciation of the value of the cooperative. The cooperative also achieves the reduction of risk facing its members in the form of wide price swings through controlling a significant part of the supply and by diversifying its product portfolio to target more than one market, thus creating an indispensable collective good. Further, the cooperative is a key local business whose positive performance creates value for a much wider set of stakeholders than its membership. Consequently, most of the island's inhabitants view Santo as an institution largely ingrained into local business and social life.

The mandatory status of Santo Wines was important during the early years of the cooperative since it enabled Santo to design and gradually implement a combination of market and community solutions. Such instruments now play a far more important role in addressing the free rider issue than the cooperative's mandatory status. Particularly community solutions, such as fostering interpersonal relationships between members and the management, promoting Santo's image, and building a strong brand for their products, have been instrumental in creating motivational homogeneity among the cooperative's stakeholders.

The implementation of all solution instruments, however, has been largely fuelled during the last two decades by several European Union support measures. Such support provided the financial leverage that the cooperative needed to invest in infrastructure and the improvement of winemaking equipment in order to produce and distribute top-quality wine, penetrate export markets, and establish a very popular and successful

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brand name. This argument is at least partially supported by the on-going relationship between Santo and IOWs. Given the small quantity of grapes produced on the island, the strategic choice of some IOWs for backward integration is rational. In these cases, Santo's board of directors has decided, albeit not in official documents, to exempt individual wine makers from the delivery requirement. Whether this represents a strategic move to minimize IOWs' complaints or simply a manifestation of a collaborative relationship between competitors is difficult to tell.

Further, the cooperative's CEO argues that EU support measures have played a far more important role in sustaining Santo's competitive advantage than its mandatory status. Yet, as we should expect, he is uncertain as to whether the forthcoming change in the regulatory framework will have a net positive or negative effect on Santo and local grape producers. As shown in this paper, Ostrom's core design principles for the efficacy of groups can be used in at least two ways. First, as a theoretical framework useful in understanding why government intervention in the Santorini wine industry might have been a rational choice back in the late 1940s. Second, it can be used as a checklist for identifying necessary conditions for the self-organization of Santorini's grape growers in the near future. With respect to the latter, though, one should be very cautious. Ostrom's principles represent necessary but not sufficient conditions. Thus in the next years Santo will very probably need to adapt these principles to local circumstances by utilizing all available formal and informal institutions and, if deemed necessary, by creating new ones. This seems to be among the top priorities of the cooperative in the ensuing years.

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