



Ager. Revista de Estudios sobre Despoblación y Desarrollo Rural

ISSN: 1578-7168

ISSN: 2340-4655

ager.journal@gmail.com

Centro de Estudios sobre la Despoblación y Desarrollo de
Áreas Rurales
España

Sergaki, Panagiota; Kontogeorgos, Achilleas; Kalogeras, Nikolaos; van Dijk, Gert
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Ager. Revista de Estudios sobre Despoblación y Desarrollo Rural, núm. 29, 2020, pp. 7-38
Centro de Estudios sobre la Despoblación y Desarrollo de Áreas Rurales
Zaragoza, España

DOI: <https://doi.org/10.4422/ager.2020.04>

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*Reciprocity and Cooperative's
Performance.
The Example of Mandatory Greek
Cooperatives*



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DOI: 10.4422/ager.2020.04

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Revista de Estudios sobre Despoblación y Desarrollo Rural
Journal of Depopulation and Rural Development Studies

Reciprocity and cooperative performance. The example of Mandatory Greek Cooperatives

Highlights:

1. Agricultural cooperatives by adding value to agricultural production and empowering rural smallholders, they play an important role in rural development.
2. The lack of reciprocity avails the existence of free riders with opportunistic behavior in agricultural cooperatives.
3. The higher degree of relational governance in mandatory cooperatives benefits in high degree the recognition and exploitation of the members' opportunities to improve their financial situation.
4. Reciprocity is a very important element in relational governance which contributes to member commitment and leads mandatory cooperatives to higher performance levels.

Abstract: Reciprocity is a powerful determinant of human behaviour in social exchange situations where mutual reinforcement exists between two parties. Consequently, it is supposed to be one of the fundamental resources of cooperatives. Mandatory Cooperatives is a special category of cooperatives that is characterized by a higher degree of reciprocal behaviour among members than traditional cooperatives. This paper examines the differences in financial level of these two categories (mandatory cooperatives versus traditional agricultural cooperatives) with the help of a financial approach, which is based on panel data analysis techniques. Several notions and concepts forming the financial engineering methodological framework are adopted for the design of this approach. The results reveal that reciprocity is a very important element that leads cooperatives to higher performance levels.

Keywords: Reciprocity, Mandatory Cooperatives, Traditional Cooperatives, Performance.

Reciprocidad y desempeño cooperativo: el ejemplo de las cooperativas agrícolas obligatorias griegas

Ideas clave:

1. Las cooperativas agrarias desempeñan un papel importante en el desarrollo rural añadiendo valor a la producción agrícola y empoderando a los pequeños agricultores rurales.
2. La falta de reciprocidad deriva en la existencia de autónomos y/o empresas con comportamiento oportunista en las cooperativas agrarias.
3. El mayor grado de gobernanza relacional en las "cooperativas obligatorias" beneficia el reconocimiento y la explotación de las oportunidades de los miembros para mejorar su situación financiera.

4. La reciprocidad es un elemento importante en la gobernanza relacional que contribuye al compromiso de los miembros y lleva a las "cooperativas obligatorias" a un nivel superior de rendimiento.

Resumen: La reciprocidad es un determinante poderoso del comportamiento humano en situaciones de intercambio social en las que existe un refuerzo mutuo entre dos partes. Por tanto, esta es considerada como uno de los recursos fundamentales de las cooperativas. Las cooperativas 'obligatorias' son una categoría especial de cooperativas que se caracteriza por un mayor grado de comportamiento recíproco entre sus miembros que las cooperativas tradicionales. En este trabajo se examinan las diferencias entre ambos tipos de cooperativas desde un punto de vista financiero, basado en técnicas de análisis de datos de panel. Para ello, se han adoptado varias nociones y conceptos que forman el marco metodológico de la ingeniería financiera. Los resultados revelan que la reciprocidad es un elemento muy importante que lleva a las cooperativas a niveles de rendimiento más altos.

Palabras clave: Reciprocidad, cooperativas agrícolas obligatorias, cooperativas tradicionales, rendimientos.

Received: 22th of June, 2018
1st revised version: 24th of March, 2019
Accepted for its publication: 10th April, 2019

How to cite this paper: Sergaki, P., Kontogeorgos, A., Kalogeras, N., and Van Dijk, G. (2020). Reciprocity and Cooperative's Performance. The Example of Mandatory Greek Cooperatives. *AGER: Revista de Estudios sobre Despoblación y Desarrollo Rural (Journal of Depopulation and Rural Development Studies)*, (29), 7-38. <https://doi.org/10.4422/ager.2020.04>

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1. Introduction

Cooperatives, according to international labour organization, can play a major self-help role for rural development. Especially agriculture cooperatives can provide strong economic benefits to farmers, through sharing and pooling of resources, improved access to markets, higher returns for their products and strengthened bargaining position. Cooperatives improve member livelihoods and local re-investments, support rural development as well as the viability of rural communities. Moreover, agricultural cooperatives can also address the social protection needs of their members, thereby reducing farmers' vulnerability, particularly in times of crisis, and prevent them from falling into poverty (Chambo, 2009). Agricultural cooperatives, in order to achieve these benefits are based on mutual trust and reciprocal behaviour.

Reciprocal behaviour refers to those actions in which someone chooses to sustain a cost for the benefit of someone else in hopes of this behaviour being reciprocated in the future (Fitzgerald, 2011; Price and van Gucht, 2014). According to the behavioural economics theory, reciprocity is supposed to be a very strong determinant of human behaviour in collective actions as it facilitates people to ensure mutual and continuous benefits joining in a team (Gouldner, 1960; Chen, Chao and Tjosvold, 2010; van Dijk, Sergaki and Baourakis, 2019). Some of these benefits refer to the member well-being (e.g. information flow, exchange of experiences, lower transaction costs) and some other to the group well-being (economic motives,

member commitment, vivid participation, etc.). In the agri-food sector, the emergence of several local networks or collective actions among farmers that rely on reciprocal behaviour in the recent years, highlight the importance of several attributes of social capital for the successful cooperation (Chiffolleau and Touzard, 2014). Beckie, Kennedy and Wittman (2012) also demonstrate the importance of building trust and reciprocity among stakeholders situated at several places along the supply chain. Social capital is assumed to be a new production factor alongside the traditional ones of physical and human capital (Chloupkova, Svendsen and Svendsen, 2003).

Therefore, reciprocity, as a principal component of social capital and necessary condition for improving organizational efficiency and member well-being, it is a powerful weapon for the enforcement of every collective action norm, like agricultural cooperatives (Fehr and Fischbacher, 2003; Valentinov, 2004). Historically, reciprocal behaviour and trust –both increase social capital– have been crucial elements by which small farmers have survived (Chloupkova *et al.*, 2003). Hogeland (2006) declares that the norms of reciprocity and trust is the most significant asset of cooperatives in comparison to investor-owned firms (IOF). Vanni, in a recent work (2014), expanding Hogeland conclusions, declares that it is complicated to measure empirically the benefits that come from the reciprocal behaviour of members as it is a multidimensional phenomenon relating economic, social and institutional factors. Palmatier, Dant, Grewal and Evans (2006) claimed that reciprocity explains the positive effect of relationship investment on seller performance.

Mandatory cooperative (MC) is a "compulsory horizontal marketing organization for primary and processed natural products operating under government delegated authority" (Forbes, 1982, p. 2) that is characterized by a higher degree of reciprocal behaviour among members than traditional cooperatives. This differentiation stems from the fact that in a MC the members- producers are obliged by law to distribute their products through the MC mainly for collective promotion reasons that is to ensure a better market price (Veeman, 1987). The repeated interactions among members in such a norm seems to favour the development of mechanisms of reciprocity (Baldassarri, 2015). Iliopoulos and Theodorakopoulou (2014) declare that MCs "... represent a public policy response to the strongly held belief of farmers that they could raise their incomes by producer-controlled statutory marketing institutions...". In Greece, there exist six MCs aiming at protecting certain products with oligopolistic characteristics. They have plenty of commons with the commodity marketing boards which exist mainly in Canada, USA, UK, Australia and New Zealand.

On the other hand, an agricultural cooperative is characterized as traditional when membership is voluntary and its residual claimant rights are distributed exclusively to farmer-members on the basis of patronage volume. Residual control rights are distributed only to members who make all decisions on the basis of the 'one-member, one-vote' principle (Chaddad and Cook, 2004). The main benefits of MCs in comparison to traditional agricultural cooperatives are related to the efficient confrontation of the free-riding issues, the improvement of members' positioning in the food supply chains as well as the control of the product supply (Iliopoulos and Theodorakopoulou, 2014) and the market price (Tamilia and Charlebois, 2007). In addition, MCs achieve a satisfactory producer price with the help of measures that increase the price to consumers (marketing issues and supply control) (Wood, 1967). It has been proven that prices for agricultural products not managed by mandatory cooperatives can rise and fall irrationally. Thus, MCs, by protecting the producers' income, as well as increasing members' wellbeing could enhance reciprocity among their members.

This paper is based on the empirical study of financial data from 36 agricultural cooperatives and five (5) MC operating in Greece for the period 2002- 2008. The dataset stops at that time on purpose, as from 2009 the severe economic crisis of Greece could distort our main question analysis. The paper has the following objectives: First, it presents a comprehensive definition and operationalization of member's reciprocity that can be applied to both MC and traditional agricultural cooperatives. Second, it reviews the factors that determine members' reciprocity to cooperatives and examines in theoretical level the effect of reciprocity in organizational level. Third, it argues on how reciprocity may help cooperatives to surpass financial and performance problems. Finally, it examines with the help of empirical data the differences in economic performance among traditional and mandatory cooperatives.

This study contributes to the research on the impact of reciprocal behaviour in cooperative's performance in several aspects. First, the use of data from a European country, namely Greece, constitutes a contrasting example that projects a view beyond the Canadian context, which dominates the literature. Second, the food sector, from which the sampled traditional cooperatives and MCs are selected, is of vital importance for the Greek economy. Third, agricultural cooperatives, despite their small share (in absolute figures) in the food sector, represent the interest of an important portion of Greek producers and have long history in Greece. Finally, despite the fact that MCs constitute a particular form of agricultural cooperatives in Greece,

which is rare in Europe, very few scientists have investigated their role for their members and for society.

More specifically in Greece, Vavritsa (2010) compares in economic terms agricultural cooperatives and MC where reciprocity level tends to be higher. More recently, Iliopoulos and Theodorakopoulou (2014) address the issue of how the institutional environment affects agricultural cooperatives' ability to address the free-rider problem. They argue firstly that cooperatives can work successfully without its mandatory status and secondly that public policy support measures are more important determinants of cooperative success than its institutional shape.

The paper is divided into five major sections. After the introductory section, we present the research framework. In the third section the methodology used is presented whereas the next section deals with the analysis and results. The final section concludes with implications for academic research and practitioners.

2. Literature review

2.1. Defining reciprocal behaviour

Reciprocity is observed empirically by the perpetual exchanges of goods between the individuals and groups in a society mainly because people attempt to achieve mutual benefits through their participation in teams and socioeconomic groups over their life cycle (Nahapiet and Ghoshal, 1998; Chen *et al.*, 2010). For example, Trivette (2016) imposes that local food participants build reciprocity aiming at the mitigation of the challenges imposed by the conventional system. According to Mauss (1969)

it is precisely the reciprocity observed in the innumerable exchanges of goods in a society that –at an overall level– knits the society together in every aspect, producing trust, solidarity, commitment on the one hand and strong economic ties on the other.

Building on Mauss' explicit notion, reciprocal relations are fundamental for the enforcement of collective action norm. The lack of reciprocal behaviour among

individuals in a social norm greatly reduces the likelihood of successful cooperation (Fowler and Christakis, 2010). Following notions from behavioural economics theory (e.g., Kahan, 2002), this happens because the greater is the member's reciprocal behaviour, the greater is the incentive to cooperate with other members as well as to enhance the sustainability of the cooperative (Fowler and Christakis, 2010).

Behavioural economic theory clearly explains what differentiates collective actions among members that exhibit a "reciprocal" behaviour and collective actions among "conventional" members.

Table 1.
Comparing the two theories of collective action

	Conventional theory	Reciprocity theory
Agents	Wealth maximizers	Emotional/moral reciprocators
Collective behaviour	Unique equilibrium	Multiple equilibria
Promoting cooperation	Incentives	Trust
Variability of preferences	Homogeneous	Heterogeneous

Source: Kahan (2002).

According to the *conventional* theory, the agents (i.e., members) act as wealth maximisers. They tend to free ride and refuse to contribute to collective goods/services. That is, collective behaviour implies that in order to avoid free-riding, a dominant strategy which predicts a single collective behavioural equilibrium (e.g., universal non-cooperation) has to be adopted. In promoting cooperation, conventional theory suggests the use of incentives (either rewards or punishments) as a solution to collective actions problems. Finally, regarding the variability of preferences across members, this theory indicates that the disposition to free ride in collective action settings is relatively homogeneous.

Reciprocity theory postulates that the members are moral and emotional reciprocators. They substantially account for the opinion of others and contribute their fair share to ensure the cooperative benefits (Bijman, Cechin and Pascussi, 2013). Yet, if they may perceive the existence of free-riders, they easily hold back to avoid feeling exploited (Kahan, 2002). In collective behaviour, members similarly tend to contribute if they believe that the other members do the same thing or change into free-riders in

case the other members intend to free-ride. Regarding the policy prescriptions, reciprocity theory suggests an alternative policy, the "promotion of trust". Finally, regarding the variability of preferences, reciprocity theory argues that the disposition to cooperate varies due to members' heterogeneous characteristics (e.g., size), perceptions and attitudes (Kalogeras, Pennings, van Dijk and van der Lans, 2007).

2.2. Cooperative's & member's well-being

Psychological distance issue, as a measure of the closeness between players in a strategic interaction, has been acknowledged to have a profound influence on individual decisions. Thus, reciprocity is a crucial element for the successful cooperation of members in a collective norm. This happens because reciprocity can be developed progressively in commitment and trust, contributing to cooperative's well-being (Bijman and Verhees, 2011; Didier, Henninger and Akremi, 2012). Moreover, researches using the Prisoner's Dilemma task found that people were more likely to cooperate and reciprocate with in-group members than out-group members because they have identified increased trust (Tajfel, 1982; Gummerum, Takezawa and Keller, 2009; Fitzgerald, 2011).

However, sometimes, while initially the members' commitment is high, later on it tends to feed away (Gulati and Singh, 1998; White and Lui, 2005). This may happen due to the intensity of competition among economic organizations in the food sector as well as the information asymmetry that usually creates favourable conditions for opportunistic behaviour and low degree of transparency which hinder the market mechanism. This situation creates high transaction cost (Gulati and Singh, 1998; White and Lui, 2005) especially for small-scale farmers who lack the appropriate size of information to correspond to the fast-changing market environment. In such cases, the existence of strong cooperatives based on reciprocal and mutually supportive actions, is determinative for the members' viability.

Regarding the positive impact of reciprocity on cooperatives' well-being, there are several arguments that support it. Members with high reciprocal behaviour tend to support the cooperative investment plan (because they admit the existence of mutual benefits). Moreover, they actively participate and therefore present a strong control relationship which results not only in a better financial (or ownership) relationship and lower transaction cost but also in the absence of expensive control mechanisms (Bijman and Verhees, 2011; Osterberg and Nilsson, 2009). Moreover, it

reduces the complexity of collective decision-making which remains a challenge to competition policies (Menard, 2004). Finally, one of the most notice worthy benefit is the high willingness of members to provide equity or debt capital to the cooperative (Cook, 1995).

The positive impact of reciprocity on members' well-being is illustrated by the below-mentioned reasons: Firstly, it helps independent but closely related members to reduce their range of activities and concentrate on a few core competencies (Prahalad and Hamel, 1990). Moreover, it reduces transaction cost through diligent flows of information that in turn minimize information asymmetry and mitigate opportunistic behaviour as well as undertake activities jointly rather than unilaterally (Claro, Hagelaar and Omta, 2003). Furthermore, the creation of a strong cooperative based on reciprocal, preferential, mutually supportive actions may guarantee the appearance of the small farmers in the market.

However, it is ascertained by observing the market that the cooperatives have not managed to develop strong reciprocal behaviour between members and cooperative in many cases especially in southern Europe. Why? Some of the problems impeding reciprocal behaviour and giving to the members' space for opportunistic behaviour (free-riders) in a cooperative may be: the scarce management capability, the high member heterogeneity, the lack of the appropriate business mentality as well as the disbelief of the members for the long-term viability of the cooperative. Moreover, the intense introversion and the weakness of communication and common decision-making that characterizes many cooperatives as well as the disappointment of the members for the beneficial characteristics of the cooperative block reciprocal behaviour (Matopoulos, Vlachopoulou and Manthou, 2005; Sergaki, 2010; Cechin, Bijman, Pascussi and Omta, 2013).

2.3. Cooperatives and local development

Agricultural co-operatives (traditional, re-engineered, mandatory, new generation, women) established in rural, marginalized, remote areas constitute forms of entrepreneurship that promote local development by several ways. The most obvious is related to the increase of off farm employment not directly related to agricultural holdings and consequently to the formation of salaries in regions with limited job opportunities. In reality, there are a lot more factors that contribute to that.

Literature declares that cooperatives in rural areas when they have premium quality products, original ideas and great dose of enthusiasm and belief for their products, may become a bouncing board for the local development (Iakovidou, 2012). By manufacturing quality food products using local resources (agricultural production, long-lost traditional recipes, family business, farming buildings, etc.) they satisfy demanding consumers (especially urban dwellers) that search such products in the countryside. These consumers resist the industrialized, globalized food system and they are trying to find ways to re-establish their lost relationship with food, agriculture and producers (Anthopoulou, 2010; Partalidou, 2015). They are willing to travel in order to approach local products and this trend offers a valuable opportunity not only for small local farmers to distribute their produce within a short distance (minimizing food miles) and achieve fair prices but also for the development of rural areas. Therefore, small cooperatives put their region/village on the map of alternative tourism by demonstrating and advertising their cultural attributes together with their local products contributing to local development. Local products in accordance with the revival of old local customs, procedures, the creation of footpaths for walk, the birth of agro touristic enterprises, cooperatives or farms for alternative travelers can combine a tempting package with great potentials for the economic revival of the countryside.

Similarly, small local farmers of specialty products in most cases cannot efficiently reach consumers and promote by themselves their products contributing to local development because of several market obstacles (for example limited quantities or high production/manufacturing cost). Researches indicate that producers of specialty products that participate in MC enjoy multiple benefits that also greatly improve local development (Vavritsa, 2010). Iliopoulos and Theodorakopoulou (2014, p. 678) found that the members of the mandatory cooperative "Santo Wines" in the southern part of Greece face lower risk level

...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...

Another very important result of the existence of healthy cooperatives in remote areas is that they contribute to the overall rural revitalization by retaining the

population in the countryside. The challenge of rural depopulation is a common attribute of all less-favored regions, especially as the migrating trend of females is more intense than that of males (Sergaki, Partalidou and Iakovidou, 2015). Small healthy cooperatives play a determinative role in keeping the social and ecological balance in the regions with increased level of depopulation by extenuating the dangers of their disorganization (Kizos and Iosifides, 2007).

Cooperatives also contribute to the advance of members' social status in rural areas. Their regular contacts with people-customers that have different cultural background provide them the opportunity to overpass the limits of their own small world, gain knowledge and experience and consequently expand their personal horizon, serving as a socialization tool with multidimensional benefits for the whole region. Their members have a sense of belonging to society, increased level of self-esteem, self-confidence as well as economic independence (Gidakou, Dimopoulou, Lagogianni and Sotiropoulou, 2008; Iakovidou, 2012).

2.4. Reciprocity in MCS

MC is an institutional hybrid since it combines public and private interests. It mixes self-regulation mechanisms operated by private partners and a legal framework supervising these mechanisms (Royer, Menard and Gouin, 2012). They have dual dimensions: "the hybrid organizational" mode as well as a mix of private interests and public monitoring. These roles create increased potentials for market success. Some MBs' arrangements include supply management, i.e. "centralized control" over the quantity and/or price of one or more commodity of a specified group of producers to a particular market or markets in a given time period.

Figure 1 presents the aims of Marketing Boards (MB) (the same with MC) to each part of food chain. Although there exist common goals (as indicated by the arrows) the list includes widely divergent and even contradictory goals between the players in the food chain. (Troughton, 1989). The most important remark from Fig 1 is that MBs create multiple benefits for each participant in the food chain. However, the producer's part enjoys the majority of them. Therefore, the members can benefit a lot from the existence of healthy and robust agricultural cooperatives. This potential favours the cultivation of reciprocal behaviour among members.

Figure 1.

Goals of Marketing Boards and supply chain management arrangement identified by participant group in the food chain

Producer	Agribusiness	Government	Consumer
Maintain increase farm income		➡	
Greater stability of Producer Price			
Equitable treatment / Market access			
←	Market Efficiency	➡	
←	Product Quality	➡	➡
Protection from Oligopolies			
←	Protection from input competition		
	←	Safeguard over food supply	➡
←		Self- Sufficient	
←	←	Eliminate surplus	
		←	Availability and variety of cheap food

➡ strong to moderate interest of other groups
 → moderate to weak interest of other groups

Source: Adopted from Troughton (1989, p. 368)

MCs constitute a particular form of agricultural cooperatives that succeeds a satisfactory level of reciprocity and mutual dependence among members who are obliged to distribute their products through this type of cooperative. By definition, MCs are systematically oriented towards organizing activities through members' coordination and cooperation (Hiscocks and Bennett, 1974; Troughton, 1989). In many cases, the establishment of a MC is a reaction to situations where middlemen and/ or foreign buyers are perceived to hold monopsonistic power over producers. Hence, the role of the MCs is frequently articulated as being one of organizing producers into monopolistic agencies with real countervailing power, of reducing inefficiencies due to unwarranted competition and finally of eliminating the capacity of intermediaries to manipulate margins at the expense of producers and consumers. Therefore, these

particular market circumstances signify the higher degree of reciprocal behaviour among members than traditional cooperatives.

2.5. MC Worldwide

MCs as private organizations recognized by the State (state-controlled) that trade agricultural products, firstly appeared in the beginning of the 20th century on both developing and developed countries. They can be divided into two main categories. The first one is the Monopolistic Mandatory Cooperatives that create a single-commodity seller (found mainly in developed countries). The second one is the Monopsonistic Mandatory Cooperatives that concentrate buyer-side market power in one organization (found mainly in developing countries). The first category was established in order to raise and stabilize farm prices and incomes in acceptable levels at the expense of consumers through limited supply. The second category was established so as to give the state control to fix official producer prices as well as capacity to tax agriculture in order to subsidize industrialization. Moreover, MCs handle the strategic food reserves for emergency situations as they have the responsibility to import food in shortage seasons.

MCs, especially those equipped with supply management powers, stem from a protectionist vision of farming. To a great extent, they swift farming from competition and market risk in an innovative way. However, the protection is more and more outdated in the open economy (Dumais, 2012). The rapid dismantlement of mandatory cooperatives in various countries is perceived as the result of the new economic paradigm promoting the restoration of more active market forces in all sectors of the economy. Further down, there are presented the mandatory cooperatives in different developed countries (and different names).

The American "marketing orders" are initiated by producers and are mostly found in the milk, fruits and vegetable industries. Their effectiveness relies on a specific institutional framework, the Agricultural Marketing Agreement Act of 1937, implemented under the authority of the Secretary of Agriculture. The main objectives of marketing orders are to stabilize market conditions for producers while guaranteeing adequate supply of food products to consumers. Their functions fall into three broad categories: quality control, quantity control and market support (Anderson, 1982). To reach these goals, MCs are allowed to set minimum quality standards, control volume marketed, pool prices, and carry out research and

development activities.

The Canadian "marketing boards" share many characteristics with American Marketing Orders. They can be national, provincial as well as inter-provincial. They are often classified by marketing functions (i.e. market service tasks that need to be performed to get products from farms to markets), depending on the function's involvement in the marketing process. The promotional boards may carry out market research, sales promotion, and even impose a levy on producers to carry out such tasks. They are not involved in marketing operations per se (such as buying and selling or transactional tasks). They act more like the advertising and promotional arm for the agricultural commodity and are thus involved in primary demand stimulation (but selective demand is possible if the board has specific brands). Such boards as well as most others are not the ones that give marketing boards their bad reputation, at least in Canada. Supply management boards are the ones that are most troublesome from a public policy perspective. They control supply by assigning output quotas to individual producers. Such supply management boards are similar to a cartel and act as a self-regulated monopoly (Loyns, 1980). They control individual producer output, but also entry into the industry and fix prices for buyers.

In Australia, "marketing boards" used import protection and home consumption price schemes to stabilize producer prices. They initially received financial support from the state, although such support later declined as the focus of the boards changed. A number of state and commonwealth-level marketing boards were later established, with varying degrees of authority and responsibilities in the marketing of agricultural products such as wool, dairy, meat, wine and brandy, honey and horticultural products. The marketing boards in New Zealand evolved in a similar manner, with regulatory authority in export marketing and licensing but no direct financial support from the state. These boards, involved in the marketing of dairy, apple and pear, kiwi fruit, horticulture, meat and wool products, all used activities such as single-desk selling, price pooling, revenue pooling and preferential financing to seek higher producer prices.

In France, an "inter-profession" is defined as a private organization recognized by the State, that gathers all segments of an agro-food chain with the objective of elaborating contractual policies guaranteeing equity among partners and allowing the enhancement of chain performance (Coronel and Liagre, 2006). Two periods in the emergence of the French inter-professions must be distinguished. The first inter-profession was settled in 1936 in the wheat sector as a tool to reduce price and supply variations. The second wave took place in the 1960s with the enactment of a series of agricultural laws. These second generation inter-professions put emphasis on the

improvement of coordination along the chain by improving partners' cooperative behaviour and on carrying out actions of collective interest such as research and development and commercial advertising (Valceschini, 2001). Both waves of mandatory cooperatives confront similar problems, e.g., problems of coordination in the chain of transactions to meet a rapidly changing demand with increasing attention to quality issues among consumers, problems of asymmetry among partners with the rapid concentration of processors and distributors, and the need to adapt to deep changes in the technology. The inter-professions are embedded in a legal framework that institutes a centralized and compulsory negotiation between partners and that imposes various conditions regarding product distribution and supply management. This institutional embeddedness gives inter-professions legitimacy in adopting and implementing measures that determine how the quasi-rent will be shared among partners as well as in closely monitoring supply. Similar to marketing boards and orders, once decisions have been approved by an inter-profession, all producers and industrials must comply with them.

In the Netherlands these associations flourished in the 1930s, aiming at the protection of the agricultural sector and the legal entities representing producers, agro-industries and buyers. In Spain several associations were developed around sugar beet, dairy products, oranges, olive oil and rice. However, these organizations underwent profound changes during the political transition period and with the entry of Spain into the European Union some of them were even closed. Something similar happened to other inter-professional associations created in Italy, Germany and the United Kingdom. At present, however, these associations are attracting renewed interest. Evidence for this is the emergence of at least 18 new inter-professional bodies in Spain after a new Law on Agrifood Inter-Professional Associations that was enacted in 1994. Italy is experiencing similar developments, but to a lesser degree, upon enactment of the Law 88/1988 on Inter-Professional Agreements (Navarro, 2002).

In Greece, "mandatory cooperatives" first appeared in the decade of '20, as cooperatives of re-cultivators when national laws enabled their establishment (Iliopoulos and Theodorakopoulou, 2014). Despite the reactions for being opposed to co-operative principles, the MCs have been established with special laws (Act 12, paragraph 6) so as

...to confront problems and protect special products and activities, e.g. for the protection of products of domestic origin, for the achievement of common goal of public interest or for the common exploitation of agricultural land or other wealth-producing sources, provided that in any case it is ensured the equal treatment of the participants... (Avdelides, 1986)

Under this legislation, the sale of particular agricultural products from a well-defined region through these cooperatives is obligatory for all producers (Troughton, 1989; Iliopoulos and Theodorakopoulou, 2014).

The MCs that are activated today in Greece are separated in two main categories (Vavritsa, 2010):

- A) Cooperatives that are referring to the guarantee of property or the rational management of land, forests etc. These cooperatives are mainly formed to ensure property rights issues over agricultural land, forests etc. and
- B) Cooperatives that are aiming at the protection of certain products with collective appearance, products of particular geographic regions or products that need collective promotion in order to be ensured their better disposal in the market. These cooperatives are mainly formed to address failures in the market of specialty products.

In the current study we are focusing on the second category of MC. As it was shown in this part, according to the literature review, there is a positive effect of reciprocity on organizational performance within traditional cooperatives and MC. Moreover, there exists a theoretically based indication that the MCs enjoy a higher level of reciprocity among members and cooperatives, which is mostly based on their organizational structure. More specifically, in small groups where the members have frequent interactions with each other as part of their organizational conditions/obligations towards the cooperative (like in mandatory Greek cooperatives) and therefore have the opportunity to evaluate other member's behaviour, motivations and capacities, the members show greater degree of reciprocal behaviour. Etzioni (2000) explains that the group "morality" can become so increased in small groups that members are no longer able to change their individual behaviour or follow their own targets. Therefore, the members of MC, as members of small agricultural cooperatives that share knowledge, experiences, ideas, fears etc. and jointly work for the cooperative and their product success is expected to show higher degree of reciprocity as a result of their daily interactions than the members of traditional cooperatives.

Based on the observations above, it would be very interesting to address empirically the following question:

Can we detect differences in economic performance among traditional agricultural cooperatives and MC?

Answering this question is crucial, since in Greece no empirical evidence is provided on the differences in performance level among traditional agricultural cooperatives and mandatory cooperatives. The results could reveal the role of reciprocity on collective action in the food sector in Greece.

3. Analysis and modelling framework

Our sample consists of 41 agricultural cooperatives, namely 36 traditional cooperatives and five (5) mandatory cooperatives, established in Greece. Agricultural cooperatives of the sample are dealing with many objects and products, as it is the usual case for Greece. Most agricultural cooperatives in Greece are characterized as mixed cooperative dealing with farm supplying, marketing and food processing. In this way in the sample participate a mixed type of cooperatives. Data were collected through financial statements for 7 years (2002-2008) obtained by the ICAP (business directory), 2009 and personal inquiries to cooperatives' top management staff. The dataset stops at that time on purpose, as from 2009 the severe economic crisis of Greece distorts the analysis of the available financial data. However, the whole dataset, due to missing financial statements, is comprised by 251 cases instead of 287 that could come out of 41 cooperatives for 7 years.

There are many variables and econometric models, which have been used to investigate the factors that affect the performance of an enterprise (e.g. Slade, 2004). This paper examines whether being a MC or not affects the financial results of a cooperative. For this reason, a profitability model that contains a variable representing MCs was investigated. The main goal of this research is to determine if MCs have different performance level (measured as profitability) than traditional cooperatives. For this reason, the following theoretical profitability model was used to examine the profitability of traditional and MCs. Available balance sheet data for the agricultural cooperatives in combination with previous researches (e.g. Sergaki and Semos, 2006; Kontogeorgos, Giannakopoulos and Chatzitheodoridis, 2018) used to come up with the following model:

$$\text{Profitability} = a_0 + a_1\text{Size} + a_2\text{Liquidity} + a_3\text{CapitalStructure} + a_4\text{Activity} + a_5\text{MC}$$

The variables examined in this profitability model and their theoretical impact on profitability are briefly presented on Table 2.

Table 2:

The Variables used and their theoretical impact on the profitability model

Variable		Variable name	Theoretical impact on profitability
Profitability	GPSAL	Gross Profit over Sales	---
Cooperatives' Size	TA:	Total Assets	Positive
	FA	Fixed Assets	Positive
Liquidity	CR:	Current Ratio	Positive
	QR:	Acid Test Ratio or Quick Ratio	Positive
Capital Structure	TLTA:	Credibility index	Negative
	CATL:	Current Assets Over Total Liabilities	Positive
Activity indexes	SAINV:	Inventory Turnover Index	Positive
	SAREC:	Requirements Turnover Index	Negative
	SA	Assets Turnover Index	Positive
Mandatory Cooperative	MC:	Mandatory Cooperative = 1, else=0 (dummy variable)	Under investigation

Source: Authors' calculations.

Profitability

Profitability measures the operating performance of a company and shows the ability to achieve a sufficient reward to capital invested in the business. The performance of agricultural cooperatives demonstrates their ability to provide products and services at a competitive level (mostly compared to private businesses) and thus to create a surplus for their members. The performance of cooperatives in this model is attributed to the ratio of gross profit over sales. The use of this ratio was chosen for three main reasons:

- It includes the cooperatives' size in the form of sales and therefore the influence of different variables on performance comes from effective or ineffective administration for cooperatives and that is not the result of their absolute size.

- Cooperatives behavior on maximizing results is different from private and public companies. The cooperatives' main goal is to maximize the return for the members through product sales.
- Net profit and equity, for many Greek cooperatives have negative values, rendering them useless for the analysis. Therefore, they are not used in the analysis.

Size

Firms' profitability is positively affected by their size, given that in larger firms, economies of scale may appear and achieve higher productivity for the same quantities of productions inputs. Additionally, the market share of a company determines firm's competitive position also its' relative size for the sector in which it operates. In general, high market shares are associated with increased concentration in an industry that can lead to reduced competition in favor of monopolistic practices and profits. The structure of an industry, i.e. the degree of concentration, barriers to entry and the degree of product differentiation determines the degree of monopoly power, which affects business performance.

Liquidity

Liquidity is a typical measurement of the financial situation of a company. Generally, liquidity measures the extent to which current liabilities of a business are covered by the current assets. The most important liquidity ratios are the Current Ratio and the Acid Test Ratio or "Quick Ratio".

Capital structure

The capital structure of Agricultural cooperatives can be measured by the financial structure and viability indexes. The capital structure of a company shows the type and the relationship of a firm's own capital and its' liabilities (short and long-term).

Effectiveness

The effectiveness of agricultural cooperatives can be presented by the activity indexes, which measure the overall effectiveness of asset utilization. Value and progress of these indexes show the financial position of a company. On the other hand, these indexes also constitute an important criterion for evaluating the management of a company.

3.1. Empirical model

The method of ordinary least squares (OLS) in panel data format often violates the assumptions made for the form of the error (Greene, 2003). For example, the error may display heteroscedasticity which means that each Cooperative has its own variation, show contemporaneous correlation i.e., the error of the estimate of the profitability of a Cooperative to be correlated with the errors of others for the same year and finally, the error to be correlated serially (autocorrelation) which means that an error of a cooperative is correlated with the errors of previous years for the same cooperative. Therefore, estimates of these methodologies (OLS, Fixed & Random Effects) are not valid since the residual check indicates a violation of basic assumptions for our data. In order to compute more reliable estimators, the assessment of the examined model was conducted using the Generalized Error Structure model, which is based on the following model:

$$Y_{it} = X'_{it}\beta + E_{it} \quad i = 1, \dots, N; \quad t = 1, \dots, T, \quad \text{Generalized Error Structure Model}$$

This model examines panel data without separating the error term. Stata Software can calculate many approaches that have been proposed for assessing such models. The biggest advantage using these models is the fact that they are able to make estimates of the coefficients correcting heteroscedasticity and autocorrelation, both in general and for each separate cooperative. In this study we have applied two approaches namely Prais–Winsten regression and an estimation with Driscoll and Kraay standard errors (Hoechle, 2007). The results of both assessments are summarized in Table 5 for both methods.

3.2. Data analysis and findings

The analysis was conducted with the econometric program Stata/SE 13.0 for Windows. In order to choose the most suitable variables to participate in the model a procedure was used including checking R-squared and Adjusted R-squared, along with examining P-values for the predictors. Finally, the model chosen to be further investigated is the following:

$$GPSAL = \alpha_0 + \alpha_1 FA + \alpha_2 QR + \alpha_3 CATL + \alpha_4 SAINVEC + \alpha_5 SATA + \alpha_6 MC + u_{it}$$

Table 3 presents the overall descriptive statistics for the variables participating in our study. While Table 4 presents the same descriptive statistics by the cooperative type and examines their means with Wilcoxon rank-sum test. It seems that for the selected variables the indexes of profitability, capital structure and activity are

statistically different between these two types of cooperatives. This result indicates differences in the management efficiency of these types of cooperatives. On the other hand, cooperatives' size and liquidity are not different between the examined cooperatives suggesting that probably management efficiency is not a matter of size. In any case the estimation of the profitability model could shed more light on the efficiency of these two types of cooperatives.

Table 3.
Overall Descriptive statistics for the model's variables

Variable	Mean	Std. Dev	Min	Max
GPSAL	0.1446	0.1597	-1.5876	0.5217
FA	2,891,466	3,490,489	122,131	30,400,000
QR	0.6017	0.3311	-0.3546	2.1688
CATL	0.9483	0.5514	0.2097	5.7042
SAINVEC	5.4732	17.3859	0.5553	268.6863
SATA	0.8226	0.4364	0.0861	2.5127
MC	0.1219	0.3277	0	1

Source: Authors' calculations.

Table 4.
Descriptive statistics for the model's variables by cooperative type and their means comparison

Variable	Mandatory Cooperatives		Traditional Cooperatives		Means Comparison* Z value (Prob> z)
	Mean	St. Dev	Mean	St. Dev	
GPSAL	0.1910	0.1640	0.1371	0.1581	-1.757 (0.0789)*
FA	2583220	1818815	2941413	3691309	-1.044 (0.2965)
QR	0.5785	0.3501	0.6054	0.3286	0.360 (0.7187)
CATL	0.7390	0.3018	0.9822	0.5751	3.366 (0.0008)***
SAINVEC	2.2766	1.2052	5.9911	18.69	5.072 (0.0000)***
SATA	0.6142	0.2563	0.8563	.4504413	2.754 (0.0059)***

Source: Authors' calculations.

*1. Two-sample Wilcoxon rank-sum (Mann-Whitney) test for the means of each group (mandatory and traditional cooperatives), i.e. $H_0: GPSAL_{/mandatory} = GPSAL_{/traditional}$

Note: The results suggest that there is a statistically significant difference between the underlying distributions at * < 0.10; ** < 0.05; *** < 0.01

The results of the final assessment method (Generalized Error Structure Models-Table 5) show that the performance of the cooperatives is positively influenced by the following indexes:

Table 5.
Profitability assessment model using Generalized Error Structure Models

	Assessment method	
	Prais–Winsten Regression (stata: xtsec)	Regression with Driscoll–Kraay standard errors (stata: xtpcse)
Dependent variable GPSAL		
FA	1.46e-08 (2.84)***	6.62e-09b (2,04)**
QR	0.220 (3.81)***	0.2320 (3,62)***
CATL	0.062 (2.03)**	0,0686 (3,62)***
SAINVEC	0.0006 (1.34)	0.0009 (4,63)***
SATA	0.0243 (1.22)	0,0003 (1,93)**
MC	0.08 (2.22)**	0,0337 (2,88)***
Constant term	-0.0877 (-1.04)	-0,1139 (-1,39)
Panels:	heteroskedastic	heteroskedastic
Correlation:	panel-specific AR(1)	panel-specific AR(1)
N (Comments)	251	251
Waldx²(₆)	24.70***	
F(6, 40)		53.32***
R²	0.1636	0.2218

Source: Authors' calculations.

a Coefficient and Z value in the parenthesis, b Coefficient and Z value in the parenthesis.

Note: * $\alpha < 0.10$; ** $\alpha < 0.05$; *** $\alpha < 0.01$

The results of the analysis corroborate the theoretical impact of the selected variables (table 2) and their impact on the cooperatives' profitability. Both assessment methods namely the Prais–Winsten Regression and the Regression with Driscoll–Kraay standard errors resulted in statistically significant estimates with the expected signs. More specific the impact of the selected variables can be summarized as follows. The increased size (fixed assets- FA) of the cooperatives leads to an increase in performance. Cooperatives' liquidity (QR) affects positively their profitability. The proper capital structure (CATL) has a positive impact on the cooperative's performance. It makes sense that if the current assets increase comparing to debt obligations, the cooperative performance is improved. The efficiency indexes incorporated in this model have a positive impact on the performance of agricultural cooperatives. Both the inventory turnover index (SAINVEC) and the assets turnover index (SATA) appear to positively influence the cooperative performance as expected. These indexes can be used as a management effectiveness criterion as it is suggested by the estimated model. Finally, MCs seem to perform better than traditional cooperatives. The corresponding dummy variable MC affects positively and statistically significantly the performance of agricultural cooperatives with both estimating approaches.

4. Discussion and conclusions

Agricultural cooperatives by adding value to agricultural production and empowering rural smallholders, they play an important role in rural development. In the increasingly market-driven world, cooperatives can strengthen vertical and horizontal links along value chains, which respond to market incentives. As this global market change, the global cooperative movement requires support to revitalise both governance structures and business strategies. Thus, examining and understanding cooperatives' financial performance is crucial for cooperative practitioners and managers for supporting their work.

The main scopes of this study are i) to clarify theoretically the direct effect of reciprocity on organizational performance and ii) to detect empirically the differences in performance level among agricultural cooperatives and MCs. The findings of this research reveal firstly that there exists a significant impact of reciprocity on organizational performance and secondly that MCs seem to perform better than

traditional cooperatives. This is the first empirical study in Greece, which compares agricultural cooperatives and MC pursue financial statements and reciprocity theory. Consequently, the findings of this study make worthy contributions to the research on this field.

The results offer meaningful implications for practitioners in Greece. The first implication is that reciprocity is a very important element in relational governance which contributes to member commitment and trust and leads cooperatives to higher performance levels. The second implication is that the lack of reciprocity avails the existence of free riders with opportunistic behaviour as well as egocentric behaviour over the rest members which hinder organizational performance. Finally, it seems that the higher degree of relational governance in MC benefits in high degree the recognition and exploitation of the members' opportunities to improve their financial situation.

Comparing the performance level of cooperatives and MC we conclude that MC achieve a higher profitability level than traditional cooperatives in Greece, placing the greatest importance on reciprocal behaviour which favours the exploitation of the available resources at reasonable prices and save resources for the common promotion– trade of agricultural products. This is extremely important, especially nowadays, where the increased globalization and concentration observed in the retail sector has created tremendous imbalances of power in the food chain. Currently, a handful of retailers are the trading partners of some 13.4 million farmers and 310 thousand food industry enterprises across EU, putting producers and small food firms in an unfavourable competitive situation (COGECA, 2010). In European cooperatives there are also problems concerning the low active membership and trust of the members (Verhees, Sergaki and van Dijk, 2015). It seems that the member commitment is quite high at the beginning and progressively feeds away as the cooperative grows and becomes larger. So now it is time for policy makers to decide whether European Cooperatives should move towards the American model or should they rethink the basic mechanisms of Cooperatives and if necessary, to give the appropriate incentives in order to enforce the members' commitment and reciprocal behaviour.

The role of Board of Directors is also very important in order to nudge members towards this direction. A nudge is an aspect of the choice architecture that alerts people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. The most effective way to nudge is via social influence (ex. information, peer pressure) (Thaler and Sunstein, 2008). Board of Directors should take advantage of this theory, in order to contribute to a higher reciprocal behaviour of the members.

The existence of successful cooperatives in remote rural areas is not only important for the members' viability but also for rural development. By exploiting the opportunities offered, they constitute brilliant examples of mild development, branding the region and offering job positions that prevent rural depopulation.

The major limitation of the paper is that the difference in the performance level between traditional and mandatory cooperatives may stems more from the kind of products they sell or the politics they follow than the higher reciprocity. Therefore, it would be extremely interesting to investigate the degree to which the better performance relies on these parameters instead of the higher reciprocity. Moreover, the findings could have a wider appeal provided that they could be confirmed in comparable national contexts of other countries.

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Authors' Contribution

ITEM	Panagiota Sergaki	Achilleas Kontogeorgos	Nikolaos Kalogeras	Gert van Dijk
1 Conceptualization	40 %	30 %	10 %	20 %
2 Data curation	50 %	40 %	10 %	0 %
3 Formal analysis	30 %	70 %	0 %	0 %
4 Funding acquisition	0 %	0 %	0 %	0 %
5 Investigation	50 %	50 %	0 %	0 %
6 Methodology	30 %	40 %	20 %	10 %
7 Project administration	80 %	20 %	0 %	0 %
8 Resources	0 %	0 %	0 %	0 %
9 Software	0 %	0 %	0 %	0 %
10 Supervision	80 %	20 %	0 %	0 %
11 Validation	0 %	0 %	0 %	0 %
12 Visualization	70 %	20 %	10 %	0 %
13 Writing – original draft	60 %	30 %	10 %	0 %
14 Writing – review & editing	60 %	20 %	10 %	10 %

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