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**DEVELOPMENT OF CLUB SUPPLY CHAINS IN THE FRUIT SECTOR:
GOVERNANCE AND ORGANISATION, FARMERS' PARTICIPATION AND RISK OF
UNFAIR PRACTICES**

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1. Introduction

1.1 Context

The present work analyses the importance that protected vegetable varieties assumed in the agricultural sector and the influence that their use might have in the definition of governance arrangements in the agri-food supply chains. The fruit sector stood out for the extensive use of new varieties, covered by property rights protection schemes, and for the tendency to build around them specific supply chain governance models. The economic exploitation of the new varieties, known commonly as “club varieties”, is not a rare phenomenon and often it implies the adoption of innovations that go beyond the technical aspects, such as the introduction of a new breed and the related agricultural practices, but it involves economic and social aspects, that is innovations in terms of farms’ management and organisation of the supply chain.

The possibility to limit the use of a variety by patenting it and, thus, imposing to producers the payment of royalties, gained ground during the first two decades of this century. The legal basis of this exploitation is the “*sui generis*” protection system, particularly suitable for vegetable varieties, introduced by the International Convention for the Protection of New Varieties of Plants (UPOV), as revised in 1991.

Despite the benefits usually associated to plant breeding programmes, the combination of them with the protection of intellectual property rights schemes raised concerns about the organisation of supply chains based on protected varieties, in terms of power distribution along the chain, position of farmers and their welfare (Tripp et al. 2007). Breeders set up quantities to be produced, drive the choices on who will produce them and trade the harvest; they have the ability to influence both the upstream and downstream segments of the supply chain. When breeders claim the marketing rights, they are at the same time monopolist of the club variety and potential monopsonist of the harvest. In this situation, breeders have stronger bargaining power than buyers of free varieties, and unbalanced bargaining power is considered to set the ground for unfair trading practices to emerge (Fałkowski et al. 2017; Russo 2020).

1.2 Club varieties in the fruit sector

Official statistic data about the spread of club varieties is not available, but estimates made by previous studies (Guerra 2012; Sansavini and Guerra, 2015) and partial data collected from several sources (CPVO, CSO, Italian Ministry of Economic Development) showed the increased tendency

to the introduction of protected varieties in many fruit industries. The application submitted between 2002 and 2016 for the registration to the EU varieties protection system (CPVO) in the fruit sector were some 2,375, 10% of the total application submitted, while 1,433 were the validated plant variety rights ([CPVO](#); [IT Ministry of economic development](#)).

Looking at the single fruit industries, varieties innovation is particularly relevant for kiwifruit, apples, apricots, cherries, peaches and nectarines (Sansavini and Guerra, 2015). However, the implications of these technical innovations are not equal for all industries. Protected varieties of apricots, peaches and cherries have almost replaced free varieties in some of the biggest fruit countries producers in the EU, that is Italy, Spain, Greece and France. Despite this success, in these industries the use of protected varieties involves only few actors of the value chain, mainly input providers (plant nurseries) and licensees, which pay royalties to the breeders, but not farmers and traders, since the harvest can be freely marketed. Different is the case of kiwifruit and apples. The kiwi industry groups the most relevant and organised cases of exploitation of club varieties, followed by the apple industry; the latter, in 2015, counted already more than 30 protected varieties grown in Italy and Europe (Sansavini and Guerra, 2015), some of them already well known worldwide (e.g., Pink Lady[®]) and others that are acquiring visibility (e.g., Envy).

Despite the increasing use of protected varieties in the primary sector, only few industries can count on a thorough organisation of the value chain and a control not limited to the collection of royalties, but based on signed contracts that includes clauses on production, harvest, processing, and trading. The most known cases are the apple Pink Lady^{®1}, controlled in Europe by the Association Pink Lady Europe, and the yellow flesh kiwi Sungold, controlled by the New Zealander Zespri. In recent years, also the varieties of seedless grapes came to the forefront, even though for reasons not related to their commercial success but to the controversies arose between breeders and farmers about the conditions for their production, with specific references to the unfairness of these conditions deplored by producers. The seedless grapes industry might, potentially, follow the same development path of apples and kiwifruit industries, provided that the issues experienced in the past years can be overcome.

¹ Pink Lady[®] is a trademark registered in more than 80 countries and used to market several apple varieties, including ‘Cripps Pink’, ‘Sekzie’, ‘Rosy Glow’, ‘Ruby Pink’ or ‘Lady in Red’. The trademark is primarily used to guarantee that the apples sold under it meet a set of quality specifications concerning sugar content, firmness, and colour.

1.3 Research questions and organization of the work

Benefits linked to plant breeding programmes are multiple and they go from increasing yield and potential world food supply, improving market conditions and farmers' income to preserving biodiversity, reducing GHG emissions and saving water resources (Noleppa 2016). The approval of national and international legislation on property right protection allowed for another potential benefit of breeding programmes to emerge, that is the possibility to exploit the marketing potential of new varieties, whose development can be controlled by breeders through the property right schemes.

As already highlighted in the previous two paragraphs, the combination of breeding programmes and property rights legislation raised concerns about the organisation of supply chains based on protected varieties, in terms of power distribution along the chain and, as a result, farmers' position and income (Tripp et al. 2007), and in terms of potential unfair conditions that might arise in relation to their exploitation ((Di Fonzo et al. 2019).

The reform of the legislation gives to breeders the ability to influence the downstream segment of the supply chain, by setting the quantity to be produced (Di Fonzo et al. 2019) and/or by deciding which farmers to involve, limiting their freedom in terms of farm management decisions (those farmers who find convenient to grow a protected variety might not be allowed to do it). Breeders may also influence the upstream segment of the supply chain, by imposing marketing control of the harvest. Furthermore, they can define the type of contracts linking the parties in the supply chains, with specific reference to farmers, and this gives them the possibility to allocate the rights to use the goods or services, thus, to influence the power of the different parties involved (Ménard 2018). All these elements considered, breeders in a club supply chain should have stronger bargaining power than buyers of free varieties, and unbalanced bargaining power is associated with the occurrence of unfair trading practices (Fałkowski et al. 2017; Russo 2020).

The effects produced by the combination of breeding programmes and intellectual property protection schemes deployed their potential in the fruit sector, where protected varieties have not been used only to increase yield or improve environmental performance (Brown 2009; Brown and Maloney 2013; Noleppa 2016), but they allowed the sector to become an “experiment field” for the development of club supply chains.

Three main elements of interest can be identified in the development of club supply chains in the fruit sector: i) the influence breeders might have in the organisation of the supply chains and in the

definition of the relationships existing between different actors of the chain; ii) the influence breeders might exert in the choice of farmers allowed to grow protected varieties and the potential exposure to unfair commercial practices that farmers might suffer because of that; iii) the stronger bargaining power that breeders have in such supply chains, and the consequence that this might have in terms of farmers' position and welfare, including again the occurrence of unfair practices.

The research aims to understand how club supply chains are organised and what are the main consequences of this set up for farmers.

In order to analyse this problem, the study investigates three groups of questions:

1. The first group aims to understand if a governance model prevails in the club supply chain. For doing that, organisational arrangements existing in the club chains are investigated, also to understand if differences in the organisations are reflected in the governance model (RQ1, RQ2).
2. The second group of questions relates to farmers' involvement in the club chains. The governance drives the selection of participants in a supply chain (Carbone 2017; Gereffi et al. 2005; Ponte and Gibbon 2006; Ponte and Sturgeon 2014). The research aims to understand how the selection of farmers is set-up in the club chains, if specific criteria are applied and if farmers should have specific characteristics (RQ3, RQ4).
3. The third group links to the strong bargaining power that breeders have in the club chains, which might allow them to influence the distribution of value along the chain and, as such, farmers' welfare. These conditions might set the scene for unfair practices to occur, and the study investigates whether farmers' participation in club chains increases their exposure to commercial unfairness (RQ5).

Research questions are formulated as follows:

RQ1 Does a governance model prevail in the club supply chains?

RQ2 Do differences in the organization of club supply chains influence the governance model?

RQ3 Does farmers' participation respond to specific selection criteria?

RQ4 Do club farmers have distinctive characteristics?

RQ5 Are club farmers more subjected to restrictive practices than producers of free varieties?

1.3.1. Research questions: state of play

The literature does not provide numerous contributions on this topic. Di Fonzo et al. (2019) analysed the influence that legislation on property rights protection can have on determining the form of governance of agri-food supply chains in the fruit sector. The study takes in consideration the kiwi industry and it confirms only partially the concerns raised about welfare of farmers involved in club supply chains; concerns linked to the stronger position of breeders that might cause unbalances in bargaining power along the chain. The governance model changes in the club supply chains compared to those based on free varieties, being characterised by a stronger position of the breeder and a reduction of farmers' freedom to make their entrepreneurial choices. However, this change in the governance model does not necessarily harms farmers; on the contrary, it might result in higher profits for them. This happens because the breeder offers farmers more profitable conditions in order to satisfy the growing demand for the new variety. Di Fonzo et al. conclude that the conditions of this business relationship might change and deteriorate in the long run, if the demand for the new variety starts decreasing.

Guerra (2012) and Sansavini et al. (2015) collected evidences about the spread of club supply chains model in the fruit sector. They highlighted that club supply chains do not necessarily follow always the same organisational patterns, but this might change depending on the nature of the breeder and on how the breeder decides to exploit his/her property rights (e.g., creating a club chain and controlling all steps of it; requiring the payments of royalties to nurseries; requiring the payments of royalties also to farmers and distributors, etc.).

The literature related to the analysis of unfair trading practices (Fałkowski et al. 2017; Di Marcantonio et al. 2018; OECD 2008; Russo 2020) provides insights on the functioning of club supply chains. It highlighted the influence that unbalance in bargaining power may have in the organisation of supply chains and the role that stronger bargaining power of one party has in setting the conditions for unfair trading practices to emerge. Russo (2020) analysed the occurrence of unfair trading practices in the kiwifruit industry in Italy and apple industries in Slovakia and Germany. The analysis of the kiwifruit industry (where club varieties play a strong role) emphasised the differences between the organisation of non-club and club supply chains and stressed the fact that the organisation of club supply chains seems to have the conditions to increase the risk that unfair practices occur.

The importance of analysing this topic lies in the fact that the club varieties are spreading in the fruit sector and bring with them concerns related to power distributions between actors of the supply chain, in particular towards agricultural entrepreneurs, which might be more exposed to unfair practices and, as a consequence, find themselves in a weaker position. However, the literature suggests that entrepreneurs participating in club chains might benefit from a more advantageous economic position, by increasing their income. Hence, the interest in better understanding the organization and functioning mechanisms of the club supply chains, the possible existence of an *ad hoc* governance model for these supply chains, the characteristics farmers should have, if any, to access these supply chain.

Taking stock from existing anecdotal information and the results illustrated by previous studies, directly and indirectly related to the organisation of club supply chains and the role of farmers in them, the present work aims to bring an innovative contribution on three main aspects:

- a. the influence that different arrangements in the exploitation of protected varieties can have in the definition of the governance model;
- b. the analysis of factors that can influence farmers' participation in club supply chains;
- c. further analysis of the relationship between breeders and farmers in the club supply chains to understand if the stronger position of one party always implies that the other party is more exposed to unfair trading practices.

1.3.2. Introduction to the methodology and structure of the work

The present work is divided in two main parts. The first includes four chapters that give an overview of the main topics considered of relevance in the analysis of club varieties. Chapter 2 provides information on the evolution of the legislation on property right protection and a description of the main actors usually involved in a club supply chain. Chapters 3 and 4 provide the economic context from which the research has developed (clubs theory, hybrids institutions, governance and organisation, role of power allocation, bargaining power, vertical and horizontal integration). Finally, chapter 5 illustrates the evolution that the importance of unfair trading practices assumed in the EU agricultural sector in the last decades.

The first three chapters of part II illustrate the three main areas on which the research is structured, which correspond to the analysis of case studies linked to the three main functions the governance plays in the coordination and organisation of supply chains (Carbone 2017; Gereffi et al. 2005; Ménard 2018; Ponte and Gibbon 2005).

A survey submitted to farmers and semi-structured interviews to breeders/licensees, Producers' organisations (PO) and other intermediaries are the main methodological tools used to collect data.

The survey was submitted to 85 farmers of the kiwifruit industry. The questionnaire was structured in two sections: the first section includes questions aiming to understand the characteristics of farmers; the second includes a set of questions related to the occurrence of unfair trading practices (table 1). Details about the collection and elaboration of data are provided in chapters 7 and 8, which analyse, respectively, the issues affecting farmers' involvement in club supply chains and the occurrence of unfair practices, linking to distribution of power.

Table 1: Content of the survey submitted to farmers

Areas of investigation	Questions
General information	Member of a club value chain
	Age
	Gender
	Level of education (primary school, secondary school, graduation, no education)
	Farmers fulltime/parttime
	Legal form of enterprise (partnership, individual farm)
	Property of the farm
	Farm specialised in producing kiwifruit
	UAA with kiwi fruit cultivation
	Total UAA
	Storing facilities
	PO or cooperatives membership
	Nature of the main buyer
	Duration of the business relationship with the main buyer
	Better conditions offered by the main buyer
	The main buyer takes the entire production
	Reputation: the farmer trusts the main buyer
	The main buyer is the only one available
	The main buyer is the closest
	The main buyer provides technical assistance and services
Price determination	Price is based on quality
	Price is based on market conditions
	Price is based on time of harvesting
	Price is based on quantity delivered to the buyer
	Prices have a variable and fixed component
	Other criteria to determine prices
	Pricing rules transparent
	Price determination is arbitrary
	Reliable estimation of price at delivery

Areas of investigation	Questions
	Payments are timely Suppliers must insist for being paid Prices are lower than expected Prices are higher than expected Prices are transparent Buyers would cheat on prices if they could
Quality determination	Quality requirements are clear Quality testing rules are clear Quality testing rules are arbitrary Suppliers can see the quality test results Suppliers can retest the quality Quality determination is transparent Buyers would cheat on quality if possible
Access costs	Access cost are high Sell to the main buyer is becoming more costly Access requisites change overtime Investments are specific Costs are clear before starting production Future costs are clear Buyers require unnecessary investments
Negotiation/ Retaliation	Business is predictable Buyers might take advantage from exceptional events Buyers modify the contracts terms to their own interest The contract terms are vague Buyers always keep promises It is important to avoid conflicts with buyers Buyers are willing to help I gave up contracts right to preserve trade relationship

The semi-structured interviews include four main sections:

- i. The first investigates the factors determining farmers' participation in club supply chains. Questions about the following topics were included:
 - a. Preliminary contacts. The process through which initial contacts between farmers and breeders happened is examined. Specifically: who takes the initiative and the role of possible intermediaries, such as producers' organisation and cooperatives in these initial exchanges; when POs or cooperatives are involved, additional questions are asked about

how the process is managed within the POs/cooperative, to understand if farmers can propose themselves or if a strategy of the organisation exists to manage the process.

- b. Advanced contacts. The role of intermediaries is investigated in relation to the completion of contracts, in case the initial exchanges go further, and a business relationship is established. It is analysed the relationship the breeder has with intermediaries, when they are involved, and what are the role of both in the decision to include or not farmers in the club supply chain.
 - c. Selection process. The existence of a selection process to admit farmers in the club chain is investigated. Questions about potential criteria to apply to this process are asked, including the role POs and cooperatives play in it.
- ii. The second section focuses on the characteristics of contracts signed between breeders and farmers and, where relevant, POs and cooperatives, or other intermediaries. This section aims to understand about general content, length, presence of specific clauses related to, e.g., quantities to be delivered, price definition, quality standards to be achieved and possible existing penalties if they are not achieved, waste disposal, conditions to market productions, other possible obligations, conditions to exit the contract. The role of POs and cooperatives is also analysed, including the contract that the breeder signs with them, if present.
 - iii. The third section deals with the organisation of the club supply chain and the strategic approach followed by the breeder in organising it. Distribution of tasks, responsibilities, specific requirement related to agricultural practices (e.g., training, access to advice), including investments. Nature and evolution of the relationships between different actors: breeders and farmers; breeders and POs and cooperatives, when involved; farmers and POs and cooperatives; farmers among them; retailers and farmers; retailers and breeder; retailer and POs/cooperatives. Additional questions investigate about the presence of specific risks linked to the participation to a club chain and the organisation of the monitoring system, including collection of information.
 - iv. The fourth analyses the occurrence of 16 types of unfair trading practices included in the EU Decision 633/2019. This section investigates the occurrence of the 10 practices always prohibited and the six grey ones, including in the latter the frequency of their presence in the contract.

14 key actors were interviewed among buyers, POs/cooperatives, breeders and retailers for the three fruit industries considered by the study, that is apples, kiwifruit and seedless grapes. Some of the key actors interviewed cover different roles, e.g., POs might also act as buyers, breeders might be at the same time buyers. Interviews were conducted with the attempt to collect different typologies of information, taking in consideration the multiples roles that interviewees could cover. Given the limited number of studies published on the topic, also two researchers who, for different reasons were involved in analyses on the club varieties, were interviewed. The scope of these latter interviews was to gain practical knowledge about the functioning of these supply chains, with specific reference to the contracts applied to the relationships between farmers and breeders. The information collected with the semi-structured interviews complemented the data collected with the survey, and it was the basis for the completion of three case studies that analysed three club supply chains considered the most relevant at national level, that is, the kiwifruit industry in the Agro-Pontino area, the Pink Lady apple in the Autonomous Province of Bolzano and the seedless grapes in Apulia.

Part I: Setting up the context for the analysis of the club varieties supply chains

2. Club varieties: main features and legislation

2.1 Property right protection systems in agriculture: evolution of the legislation

The development of new varieties of plants with features such as resistance to pests and diseases, desirable organoleptic properties, increased yield is considered crucial to improve productivity along with farms viability, while reducing the pressure on the environment (Noleppa 2016). Hence, the use of new vegetable varieties fulfils multiple needs, but plant breeding programmes require relevant investments and economic incentives are needed for both private companies and public bodies to carry them out. This acknowledgement pushed the approval of national legislative acts to set up protection schemes in many countries, already during the 1970s and 1980s, and at international level, particularly between western countries.

The EU established in 1995 the Community Plant Variety Right (CPVR), a system that grants intellectual property rights, valid throughout the EU, in most cases for 25 years², to new plant varieties. The CPVR is in line with what is envisaged on this matter by the World Trade Organisation (WTO) Agreement on Trade Related Aspects of Intellectual Property rights (TRIPs), whose negotiations were conducted between 1989 and 1994 during the WTO Uruguay round. The TRIPs agreement entered into force on January 1st, 1995 and it is considered the most comprehensive multilateral agreement on intellectual property to date. Its main scope was to establish common milestones to be endorsed by most part of countries. The agreement leaves to single governments the possibility to approve specific and more restrictive legislation at national level. The TRIPs agreement covers several areas of intellectual property and, for what agriculture is concerned, lays down provisions on geographical indications, appellation of origins and patents, including the protection of new plant varieties.

Vegetable varieties are easily reproducible, and it is often difficult to prove their novelty; this makes it problematic to use for them traditional forms of protection, such as patents. For this reason, they benefit from “sui generis” protection systems, the most widely used of which are those provided by

² The species of vine, groups of flower bulbs, woody small fruits, woody ornamentals, potatoes and asparagus can be protected for 25 years.

the UPOV Convention (Brown and Maloney 2013). The International Union for the Protection of New Varieties of Plants (UPOV) was created in 1961 by a group of 19 developed countries and represented in the 1960s the first attempt to provide a framework for the protection of new vegetable varieties. The number of members increased over the years; as for today the UPOV counts 78 members, including developing countries. The UPOV convention has been revised several times and its provisions are in line with what is envisaged by the WTO TRIPs and the EU CPVR. The most relevant update of the Convention dates to 1991, with the amendment of article 14 paragraph 2, which extended the list of acts that require the authorization of the breeder to the harvested materials, including selling and other marketing. The possibility to extend the property rights protection to harvested materials increased the economic interest to exploit new plant varieties, whose development became a growing trend in the global food system ([EU Plant Variety Catalogue](#)), also in Italy (Sansavini and Guerra 2015). The number of new vegetable varieties protected and trademarked registered a rapid acceleration, highlighting the marketing potential that this new regulation on property rights could create (Brown and Maloney 2013).

2.2 Club varieties: description and main characteristics

Common patterns can be identified in the organisation of club supply chains. They are controlled by the rights holder that might be the breeder or a third party (licensee), to which the breeder assigned the exploitation of rights upon the payment of royalties or other fees. Table 2 describes the actors (and contextually the roles) usually involved in a club supply chain and the role they play. Depending on the organisation of the supply chain, the same actor can play different roles and have different positions along the chain.

Breeders or licensees are usually the lead actors in a club supply chain, because they hold the rights of the protected variety. Depending on the role the breeder decides to play, there might be additional actors involved. The breeder might decide to organise directly the supply chain, and thus he/she will be also the manager of the supply chain. In other cases, the breeder signs away its exploitation rights to a licensee and receives the royalties without being at the forefront. The nature of the licensee varies, and this can be a private or public company, a farmers' cooperative or producers organisation, an input provider and even a retailer.

Whether the right holder is the breeder or a third party, the key element is that he/she represents the lead firm of the supply chain and, as such, controls the set-up and organisation of it.

Table 2: Main actors involved in value chain based on patented varieties

Actor	Definition and role
Breeder	The breeder is the patent holder. It can be a public or private company/research institute, a physical person (e.g., researcher). The property rights are protected by the law and he/she can enforce it if he/she does not agree with the strategy to spread the variety or if the variety is illegally propagated.
Licensee	The licensee might be a public entity or a private company and steps in to manage the patented variety, when the breeder does not directly do it. The licensee acquires the rights to develop the variety (purchase, sharing, entrust of the rights). Rarely the breeder decides also to exploit commercially the new variety; usually the organisation of the production and marketing of the variety is entrusted to a licensee.
Input providers	They are usually nurseries that provide the propagating materials. Input providers might be: (i) the licensees of the variety. In this case they will provide growers with the inputs; they might also programme quantities of inputs to be provided per year and to whom, technical assistance and collect the royalties in accordance with the breeder. (ii) Nurseries that work under commission from the licensee or the breeder. Nurseries usually sign a contract with the licensee or the breeder to propagate the variety. The nurseries in this case do not own the propagating materials; they contract signed with the licensee/breeder usually imposes strict rules for the propagation, in terms of agricultural practices to be followed, quality criteria to be respected, number of plants to be produced, etc.
User/manager	Users are managers of the club supply chain. Sometimes this role is covered by the licensee or even by the breeder, but often there is a third actor which manages cultivation, production, processing and also marketing. This role might be taken by Producers' Organisations, cooperatives or other associations.
Farmers	The degree of freedom that farmers have when growing a patented variety depends on the degree of control of the variety decided by the licensee/breeder. Usually they sign a contract, which includes, as in the case of input providers, the respect of agricultural practices, quality criteria, rules for processing and delivering production, etc.
Middlemen and retailers	They market the patented variety. Also, in this case, different arrangements are possible; the licensee might take care of the marketing in the first place and have direct contacts with retailers or rely on intermediaries.

3. A theoretical framework for the analyses of club supply chains: from the club theory to the governance framework.

3.1 Theory of clubs: brief introduction

Since the publication of “An economic theory of clubs” in 1965 by John Buchanan, numerous applications of these theory can be retraced in the economic literature. Buchanan developed his theory as an attempt to extend the formal neo-classical economic structure to include collective ownership arrangements, with a strong link with the theory of public goods. Buchanan argues that a clear distinction is made between goods and services that are private and those that are purely public. However, “no general theory has been developed which covers the whole spectrum of ownership-consumption possibilities, ranging from the purely private or individualized activity on the one hand to purely public or collectivized activity on the other” (Buchanan 1965, pag. 1). Starting from this assumption, Buchanan developed a theory of cooperative membership, which includes the extension of ownership-consumption rights over a number of persons as a variable to be determined in the model. The theory starts from the assumption that in almost all activities there is an optimal membership and the size and nature of this membership changes in relation to economic factors. Justification for clubs have been based over the years on different factors, such as the tendency to association, the possibility to reduce costs from economies of scales or from cooperation in the production process, the sharing of public goods or public factors (Sandler and Tschirhart 1980), and for each of these different interpretation a different definition was formulated. Sandler and Tschirhart (1980) attempted to provide a definition that could include all different dimensions analysed over the years, describing a club as “a voluntary group deriving mutual benefit from sharing one or more of the following: production costs, the members’ characteristics, or a good characterized by excludable benefits” (Sandler and Tschirhart 1980, pag. 1482). The club theory has been applied to a wide range of problems, most part of which to investigate political and economic problems. Some attempts, in the 70s, were done in the directions of analysing innovation and growth in demand in relation to clubs. The interest on this theory over the year is justified by the nature of the subject, that is the analysis of people voluntarily cooperating for mutual advantage (Sandler and Tschirhart 1980). Despite the interest that this theory may entail to analyse the organisation and functioning of club varieties supply chain, another strand of the economic literature could be equally appropriated, that is the governance framework. Governance studies have been, in

the past three decades, used more frequently to analyse the distribution of power along the chain. Governance studies read power as a multi-dimensional concept involving all aspects of a transaction, such as product specification, quality standards, definition of price, resource sharing, allocation of tasks (Bonanno et al. 2018). The qualitative nature of most studies on governance combined with quantitative approaches is considered an interesting combination for future research (Ménard 2018).

3.2 Organisation, coordination and governance in the food supply chains

3.2.1. From the trade-off between market and firms to hybrids as alternative institutions

The research on organisation theory in the past decades allowed to go beyond the trade-off between markets and firms (hierarchy), identifying a number of structures that follow nonstandard organisation arrangements. These structures or institutions are usually referred to as hybrids and they have been defined as complex organisational forms that perform tasks that neither the market nor the firm can achieve (Carbone 2017). The forms (and names) hybrids can take are diverse: clusters, franchising, collective trademarks, networks, and recently also cooperatives, producers' organisations, supply chains. Despite this heterogeneity, some distinctive traits are identified in the hybrids: the importance of pooled resources; the existence of relational contracting; their relation with competitions (Ménard 2005). Sharing some resources and coordinating decisions are two important elements behind the creation of hybrids, and the reason of this is found by Ménard on the fact that market is unable to ensure adequate exploitation of resources, and integration of various function within a firm is considered to reduce flexibility. Contracts are important in other organisation modes, but in case of hybrids the distinctive characteristics of them is that they link activities and resources among partners, which also operate on other non-connected transactions. These contracts are usually incomplete, and this increases the importance that the relational dimension and the need of coordination have within hybrids arrangements. Partners remain independent and, although they cooperate to carry on some transactions, they might also compete in others. This peculiar situation can set the conditions for conflicts to emerge and, as a result, the need of mechanisms to prevent or solve them.

Supply chains belong to the category of hybrids (Ketchen and Giunipero 2004). Carbone (2017) identified a number of pulling factors that push to the creation of hybrids, which are mainly related to functions that the market or firms cannot adequately perform. These factors, summarised below,

can apply to all hybrids, but they are considered as specifically related to supply chains in the agrifood sector, thus, of particular relevance for farms.

Building a good reputation is the first factor identified. Being visible in larger markets and building a good reputation is a particularly challenging task for small farms. Building trust and a reputation is linked to the capacity to develop connections, and for a small farm being embedded in a hybrids organisation with other partners represents a possibility to create these connections. The role of trust is also relevant, particularly when uncertainty and information asymmetry are present. They push towards tightening the relationship, which is considered to reduce potential moral hazard behaviours.

Geographical proximity might be another pulling factor for the creation of hybrids, and it also can be attractive for buyers, that may lower their costs having all suppliers located in a specific area. Furthermore, sharing the same place of production can incentivise building a common reputation, based, among other criteria, on quality of products; something that often happens in the agricultural sector (e.g., kiwi and apple industries, products with denomination of origins). Sharing the production place may raise the importance to collectively manage pooled resources, as it is often the case in the agricultural sector when natural resources are particularly relevant for the production process (e.g., water, biodiversity, traditional landscape, climatic and soil conditions).

A final pulling factor for hybrids is the need to contrast the market power of big firms, as for example retailers. The existence of alternative ways to organise transactions questions the “one-fits-all” approach often adopted by policy makers, who agreed on policies built on as only integrated firms would operate in the market. Tendency of competition authorities has often been to evaluate interfirm agreements as anticompetitive, reducing the positive externalities that may stem from cooperation, particularly in agricultural markets, where that cooperation can help restore symmetry between parties (Ménard 2018). However, in the past two decades policy makers have been made aware that agreements between small farmers might contribute to improve negotiations within the agricultural markets. This brought to the recognition of the importance, at least in the European context, that producers organisations have to improve farmers’ positions, and particularly market negotiations (Ménard 2018).

Carbone (2017) also identifies some negative aspects related to the supply chains. The main downside links to the complexity needed to manage a hybrid. This complexity relates mainly to the functions assigned to firms involved in the supply chain, particularly in terms of management, and in the agricultural sectors not all farms possess the adequate skills and knowledge to carry on these

tasks. Supply chains often entails a democratic process to take decisions (e.g., when cooperatives are involved) and this might complicate the adjustment of strategies and processes that could be needed to ensure the correct functioning of the hybrid structure. The issue of competition, already raised by Ménard (2005), might potentially originate difficulties and conflict of interest, being the firms working together but also competitors in other transactions. Finally, the hybrid organisation might complicate certain processes, such as, for example, the introduction of innovations. This requires often a process of co-creation, co-decision and co-learning among firms, which requires strong coordination and cooperation attitude. The introduction of innovation can bring to co-specialization of the firms involved, which becomes a potential source of loss for them, in case the cooperation is interrupted.

3.2.2. Coordination and governance mode in supply chains

Hybrids, as already pointed out, are numerous and diverse and it is also important to notice that different types of hybrids form a continuum where characteristics can be combined and change a type into another, as it happens with supply chains (Carbone 2017; Gereffi et al. 2005; Ménard 2018). Regardless their potential combination, hybrids have in common at least two aspects: the relationships among partners involved and the overall governance mode (Carbone 2017). Relationships refer to the types of interactions existing between partners. The nature of relationships and how they are organised are usually referred to as a coordination problem. The intensity of coordination varies depending on the means used to organise the relationship, going from market coordination, which can be considered the mildest form, to informal agreements and to formal contracts. Relationships can be vertical, when partner operate at different layers of the chain (e.g., retailer and processor), or horizontal, when partners operate at the same layers (e.g., farmers in a cooperatives). Governance refers to the management of the partners involved in the supply chain and it refers to entire process of the chain. Ménard (2018) defines governance “as a set of devices implemented within organisations to allocate and monitor assets and rights. Governance identifies the tools that make different organisations operational, while the organisation are the structures that are entitled to rights, perform tasks and transactions”. These two aspects, organisation and governance, are essential to understand how the economic system works. To understand how bargaining power is delineated and how negotiations develop between the parties, it is essential to understand what type of contracts link the parties, which are an example of governance modalities (Ménard, 2018).

Gereffi et al. (2005) and Ponte and Gibbon (2006) had already highlighted that the governance mode relates to the entire process that determines the functioning of supply chains. In particular, governance entails (i) driving the coordination between partners, assigning functions and tasks to them, (ii) selecting participants allowed to become partners within the chain and (iii) setting up the rules to distribute value among partners along the chain.

These three main functions that the governance modes perform in relation to supply chains have been an important basis to carry out the present work. The research has been articulated in three main parts, following the three main functions assigned to the governance of supply chains. On this respect, chapter 6 analyses three case studies related to the functioning of club supply chains in the three fruit industries mentioned above. The analysis aims to investigate the form of governance starting from the framework set-up by Gereffi et al. in 2005 (major details about this framework are provided in the introduction to chapter 6). Chapter 7 tackles the selection of participants in a club value chain, while chapter 8 takes in consideration the third function, that is the distribution of value among participants, which links to the exposure of some participants to potential unfair practices.

4. Supply chains organization: power allocation, vertical and horizontal integration

4.1 Distribution of power in the supply chain

Power balance across supply chains is an important concern in modern agricultural and food policy. The concept of power within the agri-food supply chain can be defined as the ability of strong parties to influence the behaviour of weaker parties (Humphrey and Schmitz 2001). Numerous are the examples of food supply chains led by strong companies, and often this capacity to coordinate the entire value chain becomes a distinctive characteristic of many governance forms in modern agricultural markets (Carbone 2017). Leading firms might take advantage of their power within the supply chain to increase their profits to the detriment of the weaker agents they coordinate. Public authorities' acknowledgement of these mechanisms underpins the legislation aimed to ensure an acceptable degree of competition in the markets. An example of these attempts is represented by the EU legislation on Unfair Trading Practices (UTPs), and by national laws, within and outside the EU, approved across the years. In the agricultural sectors the "weaker agents" are usually farmers, and the last 30 years witnessed the progressive erosion of their power.

The development of local markets and the increased presence in the market of certified products (organic, integrated, environmentally friendly, animal welfare friendly, antibiotic free, denomination of origins, etc.) resulted in more regulated markets, which might require specific investments for suppliers who want to be part of them (Ménard 2018). On the farmers' side, the lobbying effort, at least at EU level, undertaken by farmers' organisation, cooperatives, unions and occasionally by unorganized farmers (particularly at national level in different Member states) played a role on shaping policies and could influence organisational choices (Swinnen 2015). The role of information asymmetry is traditionally considered by industrial organisation the main source of distortion within agricultural market, particularly in bargaining power (Ménard 2018). The attempts to restore the symmetry might influence public policies as well as the allocation of responsibilities along the supply chain. Interfirm agreements are often considered as a possibility for suppliers in the agricultural sector to balance the distribution of power, and the tendency of competition authorities to consider some of these agreements (e.g., role of producers' organisations or interprofessional organisations) not necessarily detrimental for the competition might be considered an evolution of public policies to support farmers' position in the market.

Power balance issues still remain key to analyse supply chains; the traditional definition of market power, however, does not suffice anymore to capture all aspects of competition in agri-food markets (Bonanno et al. 2018). Alternative approaches have been suggested to better understand the functioning of these markets (OECD 2008). Bonanno et al. (2018) draw attention on the evolution of the literature from focusing on market power to applying the broader concept of bargaining power. They identify three alternative power frameworks as more influential in the current debate: bargaining power, buyer power and countervailing power.

4.2 Understanding power: bargaining, buyer and countervailing power

Market power is defined as the capacity of a firm to raise and maintain the price above the level that would prevail under perfect competition (Russo 2020). The same definition can apply to a firm that maintains the purchasing price below the level of perfect competition; this would be the case of monopsony or oligopsony (in case of a group of firms). The exertion of market power would lead to lower output levels, higher profit for the firm that exerts the power, and usually welfare losses. The loss of social welfare represents the main argument to justify the approval of policies to ensure a minimum degree of competition.

The literature on market power is related to the investigation of the effects of the consolidation of certain markets (e.g., Bain 1951). Market power is calculated through specific indices. During the 1980s the New Empirical Industrial Organisation, which consists of the formalization of micro-economic frameworks to study market power, was developed. During the 1990s the emergence of new issues, such as the importance of quality, products' attributes and reputation, together with the process of concentration observed in certain markets, led to a profound change of agricultural markets (Russo 2020). The existing market power frameworks did not suffice anymore for their analysis. Bonanno et al (2018), in their review, point out that the use of a more general concept as that of bargaining power might be more appropriate as a starting point to study agricultural markets. Likewise, Russo (2020) argues that when considering the context of UTPs, the concept of market power is too narrow to fully analyse the agricultural value chains, especially “in context of high levels of concentration and increasingly coordinated forms of vertical relationships...”.

Bargaining power is defined (Kirkwood 2005) as “the power to obtain a concession from another party by threatening to impose a cost, or withdraw a benefit, if the party does not grant the concession”. Bargaining power can be interpreted as the strength of a party to its negotiations with the counterpart; the focus, unlike the case of market power, is in the negotiations between parties.

Both market and bargaining power can result in lower prices or surplus transfers; market power achieves that by buying or supplying less, bargaining power uses the threat to withdraw from a transaction; hence, it does not necessarily result in lower trade as it is always the case of market power.

The shift from the traditional understanding of market power to bargaining power and its related concepts changed the way in which agricultural markets are analysed and allowed to describe oligopoly/monopoly and oligopsony/monopsony situations as well as to better analyse contracts in agriculture, as the most basic form of vertical integration between buyers and sellers (Russo 2020).

Another important power framework, considered by the relevant literature for the analysis of agricultural markets, is the buyer power. This type of power concerns “how downstream firms can affect the terms of trade with upstream suppliers” (OECD 2008). Buyer power can be understood as the bargaining power that a buyer exerts with respect to a supplier. It can be, for example, the power exerted by a retailer over a farmer or, considering the case of the protected varieties in the fruit sector, the power exerted by a breeder over farmers (when the breeder is also the main buyer for farmers, which often happens in club supply chains). Buyer power can be interpreted not only as bargaining power but also as monopsony power (OECD 2008). The distinction between these two cases lays on the source of power and the effects its exercise produces. As already briefly mentioned above, a firm has monopsony power if it counts on a share of purchases in the upstream market such that it can cause the fall of market price by purchasing less (or the raise of market price by purchasing more). The welfare effects of monopsony and bargaining power are similar, they both might results in lower prices; the difference lays on what causes these lower prices, being the act of purchasing less in the first case, and the threat of purchasing less in the second. Another implication that differs in the two cases relates to the effects on downstream prices, which tend to increase when monopsony power is exercised, even though input prices decreased. The key element to understand to what extent a firm can exert monopsony power is the capacity of suppliers to substitute their buyer. If suppliers can easily find an alternative buyer then the firm will not have a relevant monopsony power. The capacity to replace a buyer relates to many elements; in the short run, if the supplier made specific investment, he/she might not find alternatives and the buyer might extract quasi-rent (difference between total revenues and short-run avoidable costs) from the supplier. However, in the long run the supplier will face the attempts of the buyer to extract quasi-rent by exiting the market. Thus, in the long run, it will be unlikely for the buyer to exert monopsony power.

The exertion of buyer power may have another important implication in the upstream markets, that is the potential reduction of the incentive to innovate (Hueth et al. 1999; Lee et al 2008). A stronger

buyer able to extract a relevant fraction of profits produced by the supplier's investments might induce the latter to hold up from investing. However, the links between buyer power and suppliers' incentive to innovate is complex and the hold-up toward innovation issue is not obvious. Suppliers can find convenient to invest and improve their inputs when they face strong buyers, because innovation could prevent an additional increase of buyer power. If suppliers become highly specialised in producing what the buyer needs (e.g., the product requires specific skills to reach quality standards demanded by the buyer), the buyer might not easily replace suppliers; thus, innovation may protect suppliers for additional increase of buyer power. Likewise, the hold-up problem might be discouraged by the presence of few and strong buyers. Large buyers may consider convenient to engage with suppliers, support their investments to innovate and also coordinate them in order to have their expectation met (OECD 2008). Mérel and Sexton (2017) show that hold-up problems is less important in more concentrated markets. Higher concentration enables coordination and stronger buyers may integrate into functions of the supply chains and internalize the benefits of other stages of the supply chain. Of course, coordination could be in this case a way to discipline suppliers and a strong buyer could do it by exerting bargaining power, and threatening suppliers to replace them if they do not meet the buyer's expectations. In the long run, bargaining power exerted in such a scenario could lead to negative situations (i) in the upstream, such as less investments, less innovation and higher prices, in case suppliers decide to exit the market, and (ii) in the downstream market, with higher consumers' prices and less product variety. However, different form of power can cause positive results and do not necessarily bring to welfare-reducing issues.

Associated to bargaining power there is the concept of countervailing power, which can be defined as the ability to balance another firm's power (Bonanno et al. 2018). While bargaining power refers to the stronger party in a business relationship, countervailing power refers to the weaker party, which is exposed to the power of the stronger one. This concept is of particular interest for policy makers, because by supporting the weaker parties, for example farmers in the agricultural markets, both with direct financial support and with measures to encourage collective actions, they could mitigate the effects of the bargaining power hold by the stronger actors of the downstream market (e.g., buyers or retailers). Measures included in the European Common Agricultural Policy (CAP), such as those in support to the creation of producers' organisations, are related to this framework.

Another interesting thread of the literature that analyse power in agricultural markets is the governance framework (Ménard 2018; Gereffi et al., 2005; Gereffi and Korzeniewicz 1994). It considers the institutional features of the agri-food supply chain, by assessing which are the leading firms in the supply chains, how the functioning rules, under which bargaining power is exercised,

value along the chains is distributed and participation to the chain is regulated, are set-up. This framework tackles the complex arrangements and coordination issues that are increasingly part of the agri-food supply chains organisation (more details have been provided in chapters 3 and 6).

4.3 The role of contracts to promote vertical integration in the agri-food supply chains.

In the past decades the agri-food sectors were characterised by several changes, which have been accompanied by an increasing use of contracts (Vavra 2009). The use of contracts can improve coordination among the actors of the supply chain, management of quality, acquisition of information, efficiency of supply chains by promoting specific investments. In the agricultural markets, contracts are often used to achieve vertical coordination. In fact, contracts represent a better strategy for processors or buyers to exert power from farmers, instead of depressing input prices and quantities (Bonanno et al. 2018). Strong agents, by using contracts, can extract “quasi-rent” from farmers; however, since farmers will be guaranteed a normal return on investments, at least, in the short run, this strategy will not negatively affect efficiency. Mérel and Sexton (2017) observed that contracts length is often shorter than the lifetime of possible specific investments that farmers might have faced to acquire the assets needed by the other party. This situation can lead to the hold-up problems, so farmers, anticipating that their position within the contract will weaker, can decide to underinvest; this would have negative consequences on the efficiency of the market and on potential innovation. The authors show that this possibility is reduced when the contract concerns a concentrated industry; in this case farmers seem to have more incentives to sign the contract and the potential welfare losses are lower than what might happen in a fragmented industry. This conclusion applies to the short run, but in a long run relationship there is much uncertainty, and it might happen that farmers’ position deteriorates. Despite these controversial conclusions, the use of contracts in concentrated markets raise many concerns about the possible abuse of power, particularly when small farmers are concerned. This situation represents a challenge for policy makers, hence, the numerous legislative provisions taken in the US and in Europe (also at MS level) to mitigate the risk of power abuse, such as the recent Directive 633/2019 on unfair trading practices.

4.4 Horizontal integration of the upstream market as a tool to balance power distribution in the agri-food supply chains.

The approval of specific legislation to discourage abuse of power and unfair practices is one of the strategies adopted in the EU. Another important strand of measures to mitigate the effects of bargaining power is to strengthen horizontal coordination among farmers. This objective has been pursued across the years through the CAP, with the market provisions approved under the Common Market Organisation (CMO) regulations. The assessment of the positive effects that Producer Organisations (POs) might have in improving farmers' position is controversial. The literature on this topic does not provide a definite response about the role of POs and the characteristics they might possibly have to improve their performance. Some evidence is provided about the fact that large POs can contribute to reach economies of scale and, thus, reduce costs, even though they might experience, just because of their size, structural and organisational problems, such as complexity and reduced flexibility (Van Herck 2014). Empirical studies (e.g., Bijman et al. 2012; Cazzuffi, 2012) show that POs can (i) increase prices received by farmers compared to those paid by the market (Cazzuffi 2012) and (ii) determine, when they have a large market share, higher prices for all farmers. Sorrentino et al. (2018) investigated the role that POs might have to increase farmers' share of the total value of trade. Results of the study suggests that POs can benefit farmers by strengthening their bargaining position and their negotiation power. An important result concerns the size of POs and their specialization. In fact, larger POs are seen as more beneficial in terms of improving farmers' position, particularly when the downstream industry is concentrated. Most part of POs are specialized but promoting diversification of market channels might improve the PO's bargaining position and, as a result, that of its members.

5. Unfair trading practices: description, brief history, relevance for the functioning of supply chain and new legislation.

5.1 History and description

Unfair trading practices (UTPs) rose to prominence during the first decade of the XXI century and became subject of an intense debate at EU level, culminated with the approval of an EU directive in 2019 (Directive EU 2019/633). The European Commission in the Green Paper on Unfair Trading Practices (EU 2013) defines them as “practices that grossly deviate from good commercial conduct and are contrary to good faith and fair dealing”. UTPs may happen in any stage of the supply chain, can exist from any side of a business relationship. They usually arise when a situation of power imbalance is registered, where a stronger party succeeds at imposing to a weaker party unfavourable condition.

UTPs might concern different stages of a business relationship. They can appear when negotiating contract terms, they might be part of contract itself or be related to the post-contractual stage, that is in the implementation of the contract and the capacity of both parties to enforce contractual terms. In the negotiation phase, UTPs appears when a power imbalance exists: one party has a strong bargaining power and this allows him/her to impose terms to a weaker counterpart, thus shaping the business relationship on its own exclusive interest. The weaker party might not have the power to refuse these unfavourable conditions due to the fear to not conclude the contract and/or not having the possibility to find another business partner. This situation is considered rather common in the agricultural markets, where agricultural producers have often a limited choice of business partners or for the nature of the goods they sell, they could be unable to store their production for a period sufficient to obtain more favourable contractual terms. The strong bargaining power of one party might derive from different causes, such as e.g., differences in the size of the parties or their turnover, significant investments already made from one party to enter that specific market, economic dependency. In this situation, factors like not providing sufficient information about contract terms or asking payments for services not directly related to the contract and of no value for the weaker party might be considered as unfair practices. Once the contract is concluded, the possibility that unfair practices arise exists even if they are not included in the contract terms. Contracts might not include all possible aspects of the business relationship or they might include conditions so complex that not all parties involved fully understand their implications. Furthermore, parties might not have the same information about transactions, and this can lead to unfair behaviour from the stronger party towards the weaker. Small companies or agricultural producers are often in

a weaker position because of their lack of access to specialists to guide them to understand all implication of complex contractual terms. This situation might also lead to a lack of trust between partners, an additional complication in the business relationship.

In a perfectly functioning market, business partners could find other partners if any of the situations described above occur. However, switching to another business partners is often difficult or impossible for several reasons, such as the lack of other suitable partners or the high switching costs that this operation might require, and this become the breeding ground for the stronger party to impose unfair conditions to the weaker counterpart.

UTPs can occur in any sector, but discussions about them arose in relation to the agricultural and food sector. The food price crises in 2007-2011 drew the attention on the organisation of the food supply chain and on the concrete possibility that this sector could be exposed to the spread of unfair commercial behaviour. This period was characterised by an intensive fluctuation of prices of agricultural commodities. Consumer prices were also affected by the crises. Farmers, however, complained about the asymmetry in the transmission of price fluctuation along the supply chain, highlighting that they paid the higher costs of this crisis, compared to other actors of the chain such as processors and retailers. The increase in consumer prices passed directly into farmers with an immediate reduction of prices of agricultural commodities, while the decrease in consumer prices corresponded only marginally in increased of prices at farm level. Prices fluctuation and the asymmetry in the transmission of their effects along the supply chains happened when the influence of other structural phenomena was deploying its effects.

In 1992 the Mac Sharry CAP reform started the shift from product support, through prices, to producers' support (through income), with the aim, among others, to stabilise both agricultural markets and the EU budget expenditure. This process continued with the Fischler reform in 2003, which introduced radical changes to the CAP organisation to shape a market-oriented agricultural sector. The introduction of the single payment scheme, the cross-compliance rules, and the modulation of support, which allowed to move financial resources from direct payments to rural development, concluded the process of innovation of the CAP started in the previous decade. The agricultural sector could become more market-oriented, but by replacing direct support measures, such as direct prices support or import tariffs, with indirect support tools, farmers were exposed to the effect of global prices fluctuation, as those that were effectively experienced right after the CAP reform.

The concentration of the retailer industry is indicated as the other factor that brought into attention the UTPs related issues. In the last two decades, a strong concentration process, driven by innovation and acquisitions, was observed in the retailer sector in Europe. This contributed to create the conditions for UTPs to raise, that is, the significant different size of parties in business relationships when referring to retailers and agricultural producers and to a certain extent also to retailers and processors.

5.2 The EU Legislation: Directive 2019/633

The debate on UTPs regained its momentum in 2015 when a group of Eastern European countries pushed the EC to take a firm position about the topic. A new report published by the EC in 2016 highlighted, for the first time, the importance of making an attempt to harmonize MS legislation on UTPs, and the need to have an EU legislation on the matter. Following this position, in 2018 the EC issued a legislative proposal for a Directive on UTPs. The proposal was approved in April 2019 after the introduction of crucial amendments to the text initially proposed by the EC that enlarged its scope. The main changes introduced extended the application of the directive to the entire agri-food sector and to every step of the supply chain, included third country suppliers. The key principles of the directive are to (i) protect farmers, farmers' organisation and other weaker suppliers of the agri-food sector; (ii) prohibit a list of 16 UTPs; (iii) enhance the enforcement of the UTPs by MS authorities and promote the coordination among them; (iv) provide a minimum level of harmonisation of the legislation, leaving for MS the possibility to lay down stricter rules at national level.

The Directive protects suppliers of the agri-food sector. These suppliers are primarily farmers, including their organisations. Other actors might be considered suppliers, such as small and medium size processors or distributors that, given their size or particular position in the supply chain, might face unfair practices in their business relationships.

The protection provided by the Directive is related to the size of operators. To evaluate the size, the Directive uses a “step approach” based on turnover figures as a proxy that reflects the different bargaining powers of suppliers and buyers. With this approach a supplier should be protected from an economically stronger buyer that engages in unfair practices. Trading partners with a turnover exceeding 350 MEURO are considered to be able to address issues efficiently during contractual negotiations and they are not protected by the Directive. However, MS can provide protection for larger buyer in their national legislation, if appropriate.

Table 3: Thresholds of protection from UTPs based on annual turnover of buyers and suppliers

Suppliers	Buyers
< 2M€	> 2M€
2M€ to < 10M€	> 10M€
10M€ to < 50M€	> 50M€
50M€ to < 150M€	> 150M€
150M€ to < 350M€	> 350M€

The turnover is established according to the criteria indicated by the SME recommendation 2003/361/EC. The turnover of buyers and suppliers is defined considering also the turnover of the group to which they are possibly part of.

The Directive identifies practices that are considered always unfair and, therefore, are always prohibited and practices that might be allowed if agreed by parties and included in a signed contract. Art. 2 lists the 10 “black” practices, that is those prohibited in any circumstance, while art. 3 identifies the “grey” practices, that is those that can be agreed in a contract. Table 4 illustrates the black and grey practices.

Table 4: UTPs categories: black and grey practices

Practices always prohibited	Practices prohibited only if not part of a contract
Payments later than 30 days for perishable agricultural and food products.	Return of unsold products
Payment later than 60 days for other agricultural products.	Payment of the supplier for stocking, display and listing.
Short notice cancellations of perishable agri-food products.	Payment of the supplier for promotion.
Unilateral contract changes by the buyer.	Payment of the supplier for marketing.
Payments not related to specific transaction.	Payment of the supplier for advertising.
Risk of loss and deterioration transferred to the supplier.	Payments of the supplier for staff of the buyer, fitting out premises.
Refusal of written confirmation of a supply agreement by the buyer, despite a request from the supplier.	

Practices always prohibited	Practices prohibited only if not part of a contract
Misuse of information (potential trade secrets) by the buyer.	
Commercial retaliation by the buyer.	
Transferring the costs of examining customer complaints to the supplier.	

The Directive touches upon other two important issues related to UTPs: the contract enforcement and the possibility to address complaints. MS are asked to designate an authority (a new or an existing one), appointed to enforce the prohibitions laid down in the Directive. A list of minimum powers these authorities must have is included in the Directive (art. 6). The enforcement provisions are considered an important part of the Directive, because they give to the designated authorities the possibility to decide how to use the powers granted by the Directive (and by the national law) in single cases. National authorities can act upon receipt of a complaint, but they can also act *ex officio*, and this is considered a crucial power, since suppliers knowing to be in a weaker position might fear to submit a complaint to avoid retaliation from or risks connected to a trial against the stronger party.

As already mentioned above, the submission of complaints is another critical element when UTPs are involved. Suppliers (or in general weaker parties) might not want to take the risk to file a complaint to avoid potential financial losses related both to the possibility of commercial retaliation and costs that trials usually entail. The Directive establishes some provisions to deal with the fear factor and financial risks connected to submitting a complaint. Suppliers can submit a complaint to the national authority or also to the authority of the buyer's country, in case it is different. The complainant can ask for its identity to be protected and if he/she is part of a producer organisation the complaint can be filed on his/her behalf by the organisation. The power of the national authority to open an investigation and a procedure in the absence of a specific complaint is an important option to protect complainants from potential risks.

Powers of the enforcement authority

- To act upon a complaint or act *ex officio*
- To investigate cases that might imply UTPs
- To terminate an infringement
- To levy fines or impose other penalties.
- To publish decisions

The Directive introduces, finally, some provisions to support cooperation between national authorities. According to art. 9, the national authorities will meet regularly, with the assistance of the EC, to exchange information, discuss good practices and to assist each other in cross-border cases.

5.3 The Italian legislation on UTPs: the legislative decree 198/2021

The legislative decree n. 198/2021 (hereinafter Dlgs. 198/2021) transposes the Directive (EU) 2019/633 into the Italian system; it is also the implementation of art. 7 of law 53/2021 (European delegation law 2019-2020) on the marketing of agricultural and food products.

The provisions laid down by the Dlgs. 198/2021 entered into force on 15 December 2021 and apply to contracts for the sale of agricultural and food products concluded from that date. On-going contracts at that date must be brought into compliance with the Dlgs. within six months.

Legislation on this topic already existed in Italy. Art. 62 of the law 27/2021 had been the main reference on this matter until the approval of the Directive and its transposition. This article is abrogated³.

The Dlgs. prohibits commercial practices that are contrary to the principles of good faith and fairness, unilaterally imposed by a party to his/her counterpart. This provision is not a novelty, as the previous legislation already dealt with these cases. Nonetheless, the intent is to rationalize and strengthen the current legal framework to provide greater protection for suppliers and operators in the agricultural and food supply chain with respect to potential unfair practices.

Principles of the transaction contracts

- Based on transparency, fairness, proportionality, correspondence of services.
- They must be written and include:
 - Duration – not less than 12 months
 - Quantities
 - Price – already determined or to be determined according to criteria specified in the contract
 - Delivery and payment arrangements.

The provisions of the Dlgs apply to “business to business” contracts, that is to the sales of agricultural and food products carried out by suppliers who are established in the national territory, regardless of the turnover of suppliers and buyers. They do not apply to contracts directly concluded between suppliers and consumers (“business to consumer”).

Provisions laid down by articles 3, 4, 5 and 7 of the Dlgs are considered mandatory and prevail over any other regulations that conflict with them.

Art. 3 contains the principles and essential elements of the transaction contracts. Art. 4 lists the practices always prohibited and those that can be accepted if included in the transaction contract, in

³ Dlgs. 198/2021 abrogates also: art. 10 quater, paragraphs 1, 3, 4 and 5 of the law 27/2019; art. 36 paragraph 6 bis of law 221/2021; the decree of the Minister of Agriculture, Forestry and Food 199/2012.

a framework contract or another type of agreement, even if signed after the main contract. The practices identified by art. 4 correspond to those identified by the EU Directive. Exceptions are mentioned in relation to late payments (both for perishable and non-perishable food products) when the buyer is a public authority involved in programmes to distribute food products to schools or that provide health assistance. Art. 4 paragraph 2 provides that, in case of late payment, the legal interest, starting from the deadline, is due to the creditor. The interest rate is increased by four percentage points and is mandatory.

Art. 5 lists additional unfair practices, compared to those envisaged by the EU Directive. Some of these practices were never mentioned in any previous national legislation, in particular:

- ✓ the use of double-discount electronic tenders and auctions to buy agricultural and food product;
- ✓ the imposition of contractual conditions considered excessively burdensome for suppliers, including the case of prices clearly below production costs;
- ✓ the possibility to negotiate in the contract the exclusion of the application of the interest, as envisaged by article 4 in case of late payment;
- ✓ the possibility that the supplier imposes by contract to the buyer the delivery of products with expiry dates too short with respect to the residual life of the product itself, established contractually.

Art. 7 allows the possibility of price underselling of fresh and perishable agricultural and food products only in two specific cases: unsold product at risk of perishability and commercial operations planned and agreed with the supplier in writing.

The Department of the Central Inspectorate for the protection of Quality and Fraud Repression of agri-food products (ICQRF) is designated as national authority to enforce the provisions of the legislative decree and impose the related sanctions.

Table 5: Fines envisaged for different groups of infringements

Infringement	Fine	Minimum/maximum amount of the fine
Non written contract (art. 3, par. 2). Refusal to confirm in writing an existing contract, if the supplier asked for it (art. 4, par. 1, letter g).	Up to 5% of the total revenue of the financial year preceding the year of the investigation. The amount of the fine is determined considering the value of the goods or of the entire contract.	Must not be below 2,000€
Contract duration shorter than 12 months (art. 3, par. 4).	Up to 3.5% of the total revenue of the financial year preceding the year of the investigation. The amount of the fine is determined considering the advantage obtained by the party and the disadvantaged caused to the counterpart.	Must not be below 10,000€
Late payments (art. 4, par. 1, letters a and b)	Up to 3.5% of the total revenue of the financial year preceding the year of the investigation. The amount of the fine is based on the delay.	Must not be below 1,000€
- Short notice cancellations of perishable agri-food products. (art. 4, par. 1, letter c) - Unilateral contract changes by the buyer. (art. 4, par. 1, letter d) - Payments not related to specific transaction (art. 4, par. 1, letter e). - Risk of loss and deterioration transferred to the supplier (art. 4, par. 1, letter f). - Misuse of information (potential trade secrets) by the buyer (art. 4, par. 1, letter h). - Commercial retaliation by the buyer (art. 4, par. 1, letter i). - Transferring the costs of examining customer complaints to the supplier (art. 4, par. 1, letter j).	Up to 5% of the total revenue of the financial year preceding the year of the investigation. The amount of the fine is determined considering the advantage obtained by the party and the disadvantaged caused to the counterpart.	Must not be below 10,000€
Grey practices not included in the contract (art. 4, par. 4).	Up to 3% of the total revenue of the financial year preceding the year of the investigation. The amount of the fine is determined considering the advantage obtained by the party and the disadvantaged caused to the counterpart.	Must not be below 15,000€
- Double-discount online tenders and auctions (art. 5, par. 1, letter a). - Contractual conditions excessively burdensome for suppliers, including prices below production costs (art. 5, par. 1, letter b).	Up to 3% of the total revenue of the financial year preceding the year of the investigation.	Must not be below 10,000€

Infringement	Fine	Minimum/maximum amount of the fine
- Absence of a written contract (art. 5, par. 1, letter c). - Unjustified and disproportionate transfer of risk from one party to the other (art. 5, par. 1, letter l). - The imposition from the supplier to the buyer of products with expiry dates too short (art. 5, par. 1, letter m). - The imposition from the supplier to the buyer of contractual terms that oblige the buyer to keep a certain number of references (art. 5, par. 1, letter n). - The imposition from the supplier to the buyer of new products (art. 5, par. 1, letter o). - The imposition from the supplier to buyer of privileged shelf position of the supplier's products (art. 5, par. 1, letter p).	The amount of the fine is determined considering the advantage obtained by the party and the disadvantaged caused to the counterpart. When the first two infringements are committed together, the fine is doubled.	
- Direct or indirect imposition of contractual conditions excessively burdensome (art. 5, par. 1, letter d); - Application of different conditions for identical services (art. 5, par. 1, letter e); - The conclusion, fulfilment and continuation of a contract is subordinated to the provision of services from one party not related with the nature of the contract (art. 5, par. 1, letter f). - Obtaining unilateral undue benefits from the business relationship (art. 5, par. 1, letter g). - The adoption of any other unfair conduct (art. 5, par. 1, letter h). - The imposition from one party to the other of additional services not related to the contract (art. 5, par. 1, letter i). - The exclusion of the application of the interest, as envisaged by article 4 in case of late payment (art. 5, par. 1, letter j). - Contract conditions that allow to impose to the supplier to wait a minimum period of time, after the delivery of the product, before issuing the invoice (art. 5, par. 1, letter k).	Up to 4% of the total revenue of the financial year preceding the year of the investigation. The amount of the fine is determined considering the advantage obtained by the party and the disadvantaged caused to the counterpart.	Must not be below 5,000€

5.4 The importance of distribution of power in the UTPs debate

Bargaining power is an important concept in the discussion about UTPs. Often, bargaining power is mentioned as one of the main drivers for the occurrence of UTPs (Fałkowski et al. 2017; OECD 2008; Russo 2020). Its importance, however, relates also to the links it has with other relevant topics that may influence the occurrence of UTPs, namely: switching costs, information asymmetry, product perishability and contract enforcement.

Switching costs are the costs supported when there is a change from a buyer/supplier to another. They can boost the possibility of UTPs because they create a potential lock-in situation, where for one party it becomes too costly to switch to another business partner; the weaker party of a business relationship might accept unfair practices instead of supporting these costs. Switching costs can also be related to the presence of relation-specific investments. This would increase for one party the costs of ending a business relationship and it would also increase the potential hold-up problems, with a party that reduces the investments to limit the risk to be exposed to switching costs. Switching costs can be themselves considered as the results of a difference in bargaining power between a buyer and a supplier. This unbalance of power might create the situation where one stronger party (usually the buyer) forces the weaker party (usually the supplier) to make investments related to the business relationship. Hence, switching costs might be considered at the same time as the consequence and also the instrument that set the ground for differences in bargaining power.

Asymmetry in information the parties of a business relationship have access to, can create the basis for the differences in bargaining power. If one party of the relationship has more information about the market, the product attributes, the consumers' preferences, the stronger party can transfer part of the risk to the weaker party.

Perishability of products is another potential cause of UTPs. It reduces the options of suppliers to sell their products, diminishing their bargaining power and increasing the possibility that they accept unfavorable conditions from a stronger party.

The possibility to access mechanisms for dispute resolutions or to address institutions appointed to intervene in case of disputes is an important component of contracts. Dispute resolution might be organized differently at national level and might offer different options. However, the fact that these possibilities exist does not mean that all parties have equal access to these options. Sometimes, the suppliers find themselves in a weaker position compared to buyers in terms of legal services they can afford. Small farmers do not have financial possibility to afford long and expensive legal

procedures. Furthermore, suppliers might also be afraid of losing their business relationship if they complain. This different position might be the source of potential unfair practices.

PART II – CASE STUDIES

6. Club supply chains governance models: apple, kiwifruit and seedless grape industries

6.1 Introduction

The governance framework is a relevant strand of the literature that attempts to analyse the functioning of the three main organisational aspects of the supply chains, namely (i) coordination between partners, including distribution of tasks and responsibilities; (ii) selection of participants; (iii) power balance and distribution of value among partners along the chain (e.g., Gereffi et al. 2005; Gereffi et al. 1994; Ponte and Gibbon 2006).

The first part of the analysis aims to answer to RQ1 and RQ2, that is to investigate if differences in the organisation of club supply chains influence the governance model and if a governance model prevails in these supply chains. The taxonomy proposed by Gereffi et al. (2005) has been used as the reference framework to explain the key characteristics of the different governance forms. As already highlighted above, three club supply chains have been studied, the kiwi-fruit industry, the Pink lady apple chain and the seedless grapes.

6.2 Definition of governance

Governance is a complex concept to be defined and measured. The term governance includes both the authority and the relationships that determine how resources are allocated and coordinated within the chain (Di Fonzo et al. 2019). Humphrey and Schmitz (2001) suggest using the term governance to highlight that some firms in the chain define the rules under which others operate.

The definition of governance given by Ménard (2018) has been used for the purpose of this analysis. He considers governance as a “set of devices implemented within organizations, or among networks of organizations, to allocate and monitor assets and rights, providing the backbone to economic activities”. Hence, the term governance refers to the modalities that make alternative organisations operational, while organisations are the structures, eligible of rights and enabled to perform transactions; for example, a producer organisation is an organisation, while decision-making rules and processes represent the governance. Taking stock from this definition, the objective of the analysis is to understand if club supply chain in different industries present different forms of governance and if these differences are related to changes in the organisational structures.

For the analysis of the three case studies selected, the taxonomy proposed by Gereffi et al. (2005) has been used. This includes five types of value chains, which, as highlighted by the author “are analytical, not empirical, types, although they have been in part derived from empirical observation” (Gereffi et al. 2005, p. 83). The scope of this classification is to provide a general framework to explain the key characteristics of different governance forms. The five types of governance identified are:

- ✓ *Market*: the key characteristic of the market governance is the presence of low switching costs for both parties. Both business partners can easily replace the other party. This does not necessarily imply that links between partners are temporary and that the market governance is characterised by spot transactions only. There might be repeated transactions and the relationship may persist overtime; both parties have, however, the possibility to find new business opportunities.
- ✓ *Modular*: the key factor in modular governance is the capacity of suppliers to deliver a product following the buyer’s specifications. Suppliers take the responsibility for the skills and competences needed to follow the production standards provided by the buyer that may be more or less detailed. Usually, the transaction-specific investments are low, because despite the standards required by the buyer, the product can be delivered using general technology.
- ✓ *Relational*: the key factor in relational governance is the complexity of the interactions between buyers and suppliers. This complexity often causes dependence between the parties and the need to invest in specific assets. Relational value chains might be characterised by the high trust, the importance of reputation and the spatial proximity.
- ✓ *Captive*: high suppliers’ switching costs are key in captive value chain. They are characterised by high dependence of suppliers, which are usually small, from large buyers. In this value chains, monitoring and control are frequent tools used by buyers to manage the business relationship.
- ✓ *Hierarchy*: horizontal integration is the main feature that characterised hierarchy chains. The main form of governance is managerial and often buyers and suppliers are owned by the same property.

These governance forms are associated with three key drivers:

- ✓ The *complexity of transaction* relates to information and knowledge that need to be transferred from the buyer to the supplier to ensure the delivery of the product. The complexity is mainly related to product and process specifications, the simpler the product the less complex the transaction, and vice-versa.
- ✓ The codifiability of information refers to the capacity to transfer from one party to the other that information and knowledge needed to deliver the product. The extent to which information and knowledge can be codified and transmitted between the parties without the need of facing specific-transaction investments (from suppliers) determines the level of codifiability of information.
- ✓ The capacity of suppliers refers to the skills possessed by and capabilities of suppliers in relation to the transactions' requirements.

Giving to these three key drivers two values, high or low, Gereffi identifies five governance models that can be found, as illustrated in table 6⁴. The combination of intensity of the three determinants considered allowed to identify the five types of governance that go “from low levels of explicit coordination and power asymmetry between buyers and suppliers, in the case of markets, to high levels of explicit coordination and power asymmetry between buyers and suppliers, in the case of hierarchy” (Gereffi et al. 2005, pag. 87).

Table 6: Governance types and key determinants

Governance type	Complexity of transactions	Ability to codify transactions	Capacities of suppliers	Degree of coordination and power asymmetry
Market	Low	High	High	Low ↑↓ High
Modular	High	High	High	
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	

Source: Gereffi et al. 2005, p. 87

Captive and *hierarchy* governance types are characterised by high level of control by the lead firm over suppliers. The lead firm exerts its power, and it has a high level of control over the other actors of the chain. The difference between the two is that in the captive model there is high level of

⁴ Eight combinations of the three variables are possible, but only five generate governance types. Low complexity of transactions and low ability to codify is unlikely to occur and this exclude two combinations. If the complexity of the transaction is low, the ability to codify is high and the capacity of the supplier is low, the latter would lead the supplier to exit the chain, which is an important outcome, but it does not generate a governance type (Gereffi et al., 2005, pag. 87).

circulation of information between lead firms and its counterparts, while in the hierarchy type the information asymmetry is high; this form usually corresponds to contexts characterised by a high level of vertical integration. In the *relational* type of governance there is a good level of coordination between actors, and this is achieved through close relations between the actors and because of the good capacity of counterparts to meet the lead firm's needs; information flows are not unidirectional as they are in the previous typologies. The *relational* governance model is characterised by companies that have a good level of capacities; all actors contribute to the activity with key competences and the power balance is more symmetrical than in the previous cases. The *modular* and *market* types have a low level of coordination and of power asymmetry. In both cases, suppliers' skills are relevant and switching to other suppliers or buyers is relatively easy, since both work with several partners.

6.3 Investigation of the differences in the governance of club supply chains in the fruit sector

The taxonomy introduced by Gereffi has been used in the present research in the attempt to analyse the organization of the three club supply chains considered in this study.

The selection of these three case studies was justified by the level of development and maturity of supply chains. The Pink Lady apple can be considered the first case of organized, and successful, exploitation of a protected variety. The yellow-flesh kiwi is in a phase of expansion and this case is considered key to understand the evolution of club varieties in the market (Sansavini and Guerra 2015). The seedless grapes supply chain is of recent creation and, apparently, it has been going through several issues in its development process. Relevant conflicts occurred between breeders and farmers about the rules that breeders tried to impose to farmers who wanted to grow the protected varieties of seedless grapes.

The data to describe and classify the three club supply chains has been collected through a semi-structured questionnaire, submitted to 14 selected actors involved in the three supply chains (breeders, POs and cooperatives' representatives, licensees, other intermediaries, researchers knowledgeable on the organisation of the club chains). The questionnaire was structured in four main sections (detailed description of the content is provided in chapter 1, paragraph 1.3.2):

- ✓ The first investigates the factors determining farmers' participation in club supply chains.
- ✓ The second section focuses on the characteristics of contracts signed between breeders and farmers and, where relevant, POs and cooperatives, or other intermediaries.

- ✓ The third section deals with the organisation of the club supply chain and the strategic approach followed by the breeder in organising it.
- ✓ The fourth analyses the occurrence of 16 types of unfair trading practices included in the EU Decision 633/2019. This section investigates the occurrence of the 10 practices always prohibited and the six grey ones, including in the latter the frequency of their presence in the contract.

The scope of the questionnaire is to understand the functioning of the supply chain. However, specific attention has been dedicated to relationships between breeders and farmers.

In the typical club supply chain, breeders usually correspond to buyers (in Gereffi's table) while farmers correspond to suppliers. Table 7 shows the adaptation of the taxonomy and items illustrated by Gereffi to the case of the club supply chains in the fruit sector. The fifth governance type, hierarchy, has not been taken in consideration because it implies that farms would be owned by the breeder, which is not the case in any of the case studies analysed.

Table 7: Characteristics of the governance forms in club supply chains of the fruit sector

Characteristics	Type of governance			
	Market	Modular	Relational	Captive
Sales	Free	Regulated by contracts	Regulated by contracts	Regulated by contracts
Level of sales' negotiations	All details are negotiated	Negotiations is based on standard contracts, applied to all farmers	Farmers can negotiate some terms, but others are imposed.	Terms are imposed by the breeders.
Complexity of production	Low complexity	Not complex, but difficult for unexperienced farmers.	High. Specific skills required from farmers.	High. Farmers must receive support and advice from breeders.
Production specification/ codifiability	Low. No specific requirement needed.	Low. Standards requirements are needed, but they are simple.	High. Complex standards required by breeders.	High. Complex standards are required by breeders, and farmers must follow instructions.
Replaceability	Easy to replace business partners.	Easy to replace business partners.	Difficult to replace business partners. Trust and reputation play a role.	Easy to replace business partners, but deviations from this rule are possible.
Farmers switching costs	Low. Farmers can switch partners without facing specific costs.	High. Farmers might have faced relation-specific investments.	High. Farmers might have faced relation-specific investments.	Costly, almost impossible.

Source: Di Fonzo et al 2019 and own elaboration.

Questions included in the four sections helped to assess the different items of the governance framework:

- ✓ The *complexity of the transaction* which corresponds to the complexity of the club varieties production process. This complexity has been assessed by asking information about the breeders' requirements and whether these requirements allowed farmers freedom in the organization of the production process, or if they have to respect complex standards imposed by breeders. The answers to these questions helped to understand the *capacity to codify information*, that is the process used to transfer information and knowledge needed to produce club varieties, the set-up of monitoring systems from the breeders, the provisions of technical assistance to farmers.
- ✓ The *farmers' skills* have been assessed by asking questions about the application of selection processes to involve farmers in the club chains and also trying to measure their replaceability. These answers have been considered carefully, because in at least two of the industries considered, other factors influence the possibility to replace suppliers, for example geographic location.

Two additional characteristics have been included for the description of the governance type, the complexity of the sales' organisation and farmers' switching costs.

- ✓ If farmers can sale harvest freely to whoever buyer, this is interpreted as a sign of market governance. If the relationship between farmers and breeders/buyers is regulated by a contract, this indicates one of the other three possible options, relational, modular and captive. The prevalence of one of the three governance forms is related to the level of negotiations needed to conclude the contracts and to the degree of freedom that farmers have to negotiate contracts terms.
- ✓ The presence of low switching costs is associated with the market governance type, while the other three typologies of governance are associated to high and very high switching costs to be faced by farmers to replace their counterpart.

It would have been beneficial to submit the interview also to farmers, but it has not been possible to find farmers available for that. However, data collected with the survey submitted to farmers about the occurrence of UTPs provided additional information to complete the orgnisational picture of the club supply chains. It would have been also of great importance to see the contracts, but despite being them defined standard contracts by almost all interviewees, it has not been possible to retrieve them.

6.4 The Agro-pontino kiwi fruit industry

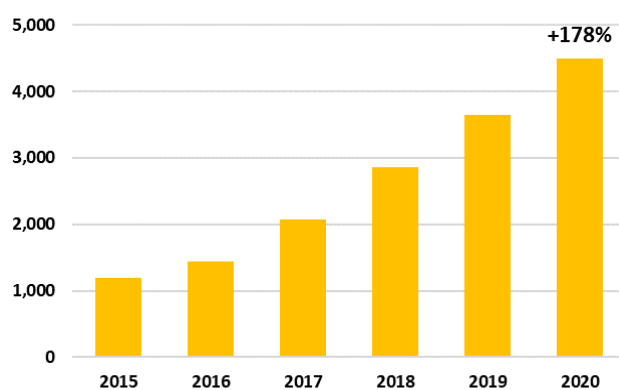
The introduction of kiwifruit in the Agro-Pontino dates to the 1970s. It is the main production area of the country, with 26% of the national acreage in 2020. The area is considered highly specialised, and it is characterised by the cultivation of both free (mainly green flesh Hayward) and protected varieties, in similar environments with respects to land quality, weather conditions, infrastructures and availability of services.

6.4.1. Development of protected varieties in the kiwi industry

The importance of protected varieties in the kiwi industry has grown considerably in the past decade, both in Italy and abroad. Commercially, the yellow-flesh varieties are the most important, although recently some companies started marketing red-flesh kiwi too, always with the club formula. Green-flesh varieties, on the contrary, are mainly free; the most important one, Hayward, is also the most extensively cultivated, both in Italy and abroad.

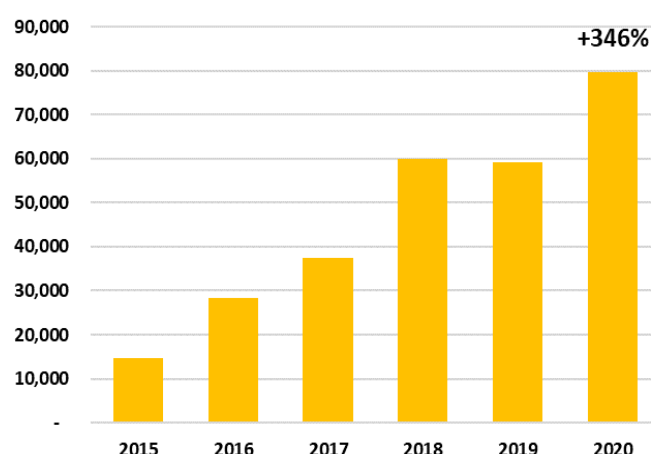
The development trends of the sector show that the club varieties are acquiring importance in terms of acreage and production, as evidenced by yellow-fresh kiwi registered within two of the main producer and exporter countries, namely New Zealand and Italy (CSO, 2020).

Figures 1 and 2 show the growing trends of acreage and production of yellow-flesh kiwi from 2015 to 2020 in Italy. Data refers to the main club varieties cultivated and marketed, that is Sungold (Zespri), Soreli, Dorì, Jingold (Jinyan and Jintao), and to the harvest that could be sold, net of waste and fruits not achieving the envisaged quality requirements. Acreage showed an increase of 178% in six years, reaching almost 4,500 hectares in 2020, while production increased of 346%, with 79,790 tons marketed in 2020.



Source: Centro Servizi Ortofrutticoli

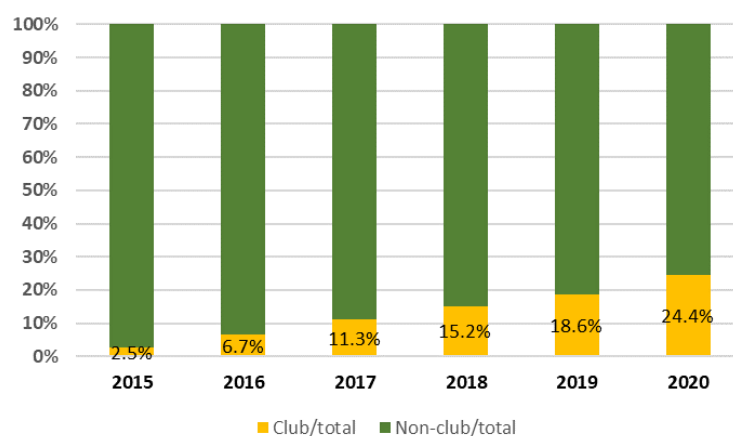
Figure 1: Acreage (ha) of yellow-flesh kiwi in Italy from 2015 to 2020.



Source: Centro Servizi Ortofrutticoli

Figure 2: Production (t) of yellow-flesh kiwi in Italy from 2015 to 2020

A comparison with the trend in the green-flesh kiwi production shows that the latter is still in Italy widely produced, as already pointed out, but quantities of marketed fruits have been decreasing constantly in the past six years, while the yellow-flesh one is increasing (figure 3).



Source: Centro Servizi Ortofrutticoli

Figure 3: Marketed (%) club and non-club kiwi fruit in Italy from 2015 to 2020.

Italy is the third main producer of kiwifruit worldwide and the main one in Europe, followed by Greece, whose production increased of 37% in the past six years (specific data about club varieties production is not available). The kiwi industry in New Zealand, second main producer of kiwifruit and first producer of yellow-flesh kiwi fruit with Zespri (265k tonnes in 2019 and 5,480 hectares⁵),

⁵ Source: Centro servizi ortofrutticoli

confirms the same trends observed in Italy, with the decreasing of the production of green-flesh kiwi and the corresponding increasing of yellow-flesh kiwi (+133% from 2015 to 2019⁶).

6.4.2. Description of kiwifruit supply chains

The industry is characterised by a variety of supply chains. The first distinction is between club and non-club supply chains (Russo 2020). The club chains trade mostly yellow-flesh kiwi (Sungold and Jingold varieties), while the non-club chains trade non-protected varieties (Hayward green flesh). Club supply chains are driven by the property right holder, or “the breeder”.

The club supply chain of kiwi fruit in the Agro-Pontino can be split in three main areas, corresponding to input provision, production and marketing. The provision of inputs is controlled by the breeder. It can be the breeder himself to provide the vegetative material to farmers or the breeder might have a network of nurseries that grow and sell the materials in agreement with the breeder himself. Production is ensured by farmers, who join the supply chain upon the signature of a contract. They can be members of POs or independent farmers. The commercialization phase can be furtherly broken into three layers, namely (i) buyers, (ii) other intermediaries, (iii) retailers. The distinction between the first two layers refers to buyers who buy directly from farmers, including POs, and buyers who buy from other buyers. Within the sector, two different club supply chains are identified (figure 4).

In the first chain identified (type A), the breeder controls all steps of it. The breeder is at the same time the supplier of the genetic input, the buyer of the harvest and the supplier who negotiates with retailers. The breeder controls the production and signs production contracts with farmers, which are all members of cooperatives or POs. The breeder signs specific contracts also with the POs. The production process, thus, is regulated by two tiers of contracts, with the PO and with farmers. The breeder provides farmers with technical assistance to guide them in the cultivation of the protected variety to reach the quality standard required to market the product with its brand. The contract signed with farmers includes the delivery of the entire harvest to the breeder. Farmers are usually allowed to grow other non-club varieties and they may or may not deliver the unprotected harvest to the breeder.

The New Zealander company Zespri adopts this form of governance in the production of the yellow-flesh variety Sungold (the trademark of the patented variety Sel. G3), and so does the Italian Consorzio Kiwigold of Cesena and the company Jingold for the patented variety Jingold.

⁶ Source: Centro servizi ortofrutticoli

Type B of the club supply chain does not necessarily use the support of POs. POs may be the licensees of the variety cultivated, then farmers are part of the right holders, or the licensee/breeder may recruit independent farmers for the production. The organisation of the other steps of the chain is the same as in type A, with contracts that bind producers to respect quality requirements and to deliver the entire production to the right holder. The Consorzio Europeo Dorì, licensee of the patented variety Dorì (patented variety AC 1593), developed by the Universities of Bologna and Udine, adopts this governance form.

The main difference between the two supply chains is the involvement of POs. In type A, POs are always involved in the production phase. The breeder signs a contract with the POs and all farmers involved are members of the producers' organisation. In type B POs are not always involved. They are part of the supply chain when they are also licensee of the protected variety. In this case, their members are the growers, but they can be also independent farmers.

Two supply chains based on free varieties have been identified in the area, even though they are not specifically targeted by this research. The main difference between them is the nature of buyers, which may be private traders or POs. POs, where present, collect the entire harvest of their members and usually they provide them with the vegetative materials. They can be considered as “the lead firm” of the supply chain, even though they do not have the same capacity to control production as it happens in the club supply chains.

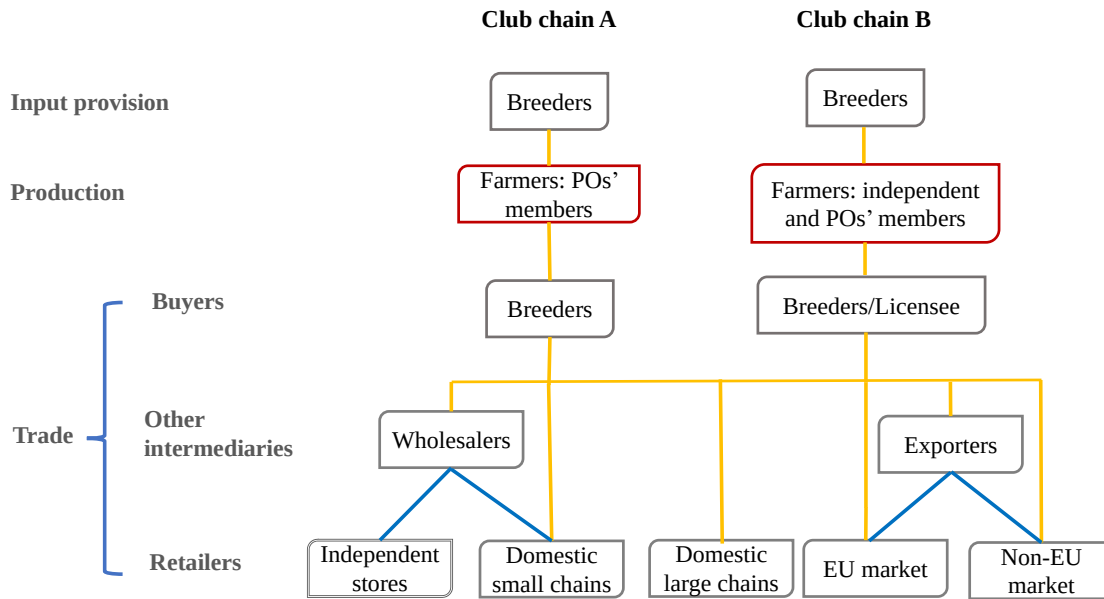


Figure 4: Club supply chains in the Agro-Pontino area

6.4.3. Identification of the governance form

The two club supply chains identified in the kiwi-fruit industry are very similarly organised. The most relevant difference is the role of the PO, which, in the supply chain A, plays a sort of intermediary role between the breeder and farmers. Both club supply chains identified in the Agro-Pontino area can be considered *captive*, according to the classification of Gereffi. The complexity of the product is considered very high. Club growers are experienced producers, and the breeder provides them with technical assistance; nevertheless, they find the agricultural practices to be undertaken rather complex, also considering the high-quality standards required by the breeder and the fact the quality might be difficult to achieve in yellow-fresh kiwi. Information and knowledge are transferred from breeders to farmers through the provision of technical assistance, which is considered compulsory and it might be possible that specific clauses about that are included in the contracts. Furthermore, breeders exercise a high level of control over farmers by using a strict monitoring system, through which detailed information is collected not only about the production process but also on the harvesting process, storage (for those farms that have storage facilities) and processing (preparing kiwifruits to be delivered to the buyer).

Despite the fact that farmers involved in these club supply chains are experienced, they, nevertheless, must rely on breeders' technical support. Their capacity to codify information is supported by the technical support provided by the breeder, being the standards requirements to be achieved rather complex. Switching costs for farmers involved in these club supply chains are

very high. It is in fact impossible for farmers to trade the harvest through other channels, since the breeder controls also the marketing process.

Farmers involved in these club supply chains follow directions imposed by the breeder, which organises in detail all aspects of the production process. This can drive to think that farmers are easily replaceable, being the key skill here the capacity to follow the breeders' support. However, the information collected suggests that breeders prefer to avoid replacing farmers once they have been involved. This implies that the selection of farmers to be involved might be a careful process for breeders; this issue is analysed in detail in chapter 7.

6.5 The apple industry: the case of Pink Lady ®

6.5.1. Introduction

Pink Lady ® can be considered the most successful and long-lasting exploitation case of a protected variety. The Cripps Pink variety was bred in 1973 under the Western Australia apple breeding programme. Property right protection for this variety was requested in several countries. In Europe in 1995 the Western Australian Agriculture Authority applied for the CPVR, request granted in 1997. The protection of the variety is settled for a limited number of years and it will expire in Europe in 2022, while in some other countries it has already expired. The Apple and Pear Australia limited - APAL (which represents Australian government for commercial apples and pears) registered the trademark Pink Lady ®, which includes the varieties 'Cripps Pink', 'Sekzie', 'Rosy Glow', 'Ruby Pink' or 'Lady in Red', in more than 80 countries and this allowed the breeder to organise the production and trading of this apple as a club variety in all of them. The trademark is primarily used to guarantee that the apples sold under it meet a set of quality specifications concerning sugar content, firmness, and colour. For the purpose of this analysis, the supply chain at EU and Italian level will be the main focus.

In Europe the exclusive licensee of the variety is Star Fruits. In the 1990s, Star Fruits signed contracts with producers in France first, and then in Italy and Spain. To date, there are in Europe 10 nurseries authorised to grow the trees of the protected varieties trademarked as Pink Lady ®; 2,944 growers; 85 packing stations and 14 authorised distributors. The exclusive licensee for Italy is VOG, the Consortium of cooperatives of the Sud Tirol area, in the Autonomous province of Bolzano. This area is suitable to produce apples, and the cooperative VOG covers some 30% of the national production and 6% of the European one.

6.5.2. Description of the supply chain

The membership to the club supply chain entails the payments of a fee per kg to cover administrative costs, an additional fee to cover marketing costs and a royalty, which is paid to Star Fruits and to the breeder APAL. The sum of fees and royalty accounts for 0.1% of the price per kg that farmers received for the harvest. The propagating materials is provided by the 10 authorised nurseries, which pay on their turn a royalty to the breeder (the amount of which was not communicated); the cost of a single tree varies between 10 and 12 euro.

The licensee signs a contract with the cooperative or PO at national level, and signs contracts also with farmers engaged in the production. Contracts are offered to farmers on a “take it or leave it” basis; there is no room for negotiation from the farmers’ side. The contract is a long-term agreement (from 10 to 20 years) and it includes clauses about quantities, pricing rules, quality standards, technical assistance. The contract includes a marketing obligation that commits farmers to sell their entire production to the licensee. In the case of the Italian market, the entire national production is marketed by VOG.

The identification of farmers to be involved in the club supply chain is done by Star Fruit with the assistance of the national licensee, VOG in case of Italy. Representatives of Star Fruit evaluate the farmers proposed by VOG against a list of standard criteria applied to select growers. Preferences are for growers with technical skills and competences. However, factors not directly related with the characteristic of the farmer are also considered. For instance, geographical location is rated as highly important for the selection of farmers. Only farms located in areas that strictly respect the criteria required to obtain a high-quality standard are selected. Being these apples harvested in November, the environmental factors are considered crucial to ensure the achievement of quality requirements. Suggestions of the cooperatives and the Consortium about the selection of farmers are taken in consideration to spot potential trust and reputational issues.

As already mentioned above, Pink Lady® is a mainly a trademark, other than a protected variety (still for few months at least in Europe), and as such Star Fruit, as well as the Association Pink Lady Europe, funded by European members of the club supply chain, undertakes numerous marketing actions. Members of the supply chain, including farmers, are actively involved in these marketing activities. According to interviewees, participation in these activities create a sense of membership to the club supply chain, which is perceived not only as a commercial action but as a more comprehensive project. In recent years, Pink Lady® started the implementation of actions to support sustainability, reduction of the use of chemical inputs and of food waste. Farmers are

directly involved in these activities, and in some production areas, such as the Italian one, this commitment was functional to reducing complains from citizens about the use of pesticides.

Figure 5 represents the main actors involved in the Pink Lady supply chain.

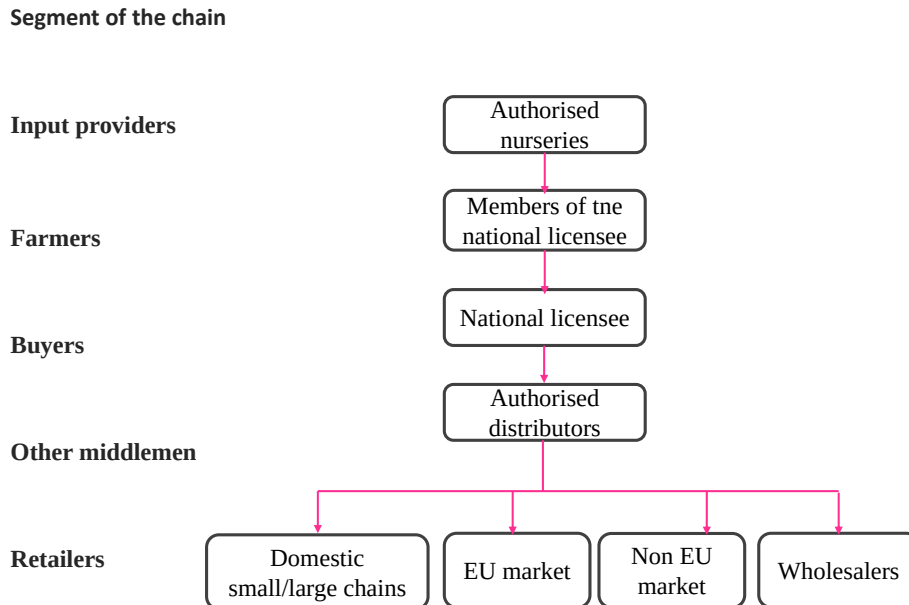


Figure 5: Pink Lady club supply chain

6.5.3. Identification of the form of governance

The Pink Lady supply chain is characterised by the presence of a very strong lead firm, Star Fruit, and by the national licensees that are the main reference points in producers' countries. Despite the production dislocated in different countries, Star Fruit plays a key role in every production area, by getting directly involved in the selection of farmers and in all phases of the production process. The involvement of all members in the marketing activities contributes to create this sense of ownership of the project "Pink Lady" that seems to mitigate the rigid control performed by the EU licensee.

The governance type can be considered also in this case captive. The complexity of the product is considered high. Farmers receive technical support from the licensee, and they must follow specific directions to reach the quality standards required by the licensee. Information and knowledge are transferred from the licensee to farmers by using technical assistance and a monitoring system that allow to verify if the production reaches the quality standards to be marketed or to be allocated to other market channels (e.g., production of juice). Despite the general high level of experience of farmers involved in this club supply chains, growers must follow

licensee' directions, usually provided via the national licensee. However, they receive technical assistance via their cooperatives or the PO to produce this variety and to achieve quality standards. Unlike the yellow-flesh kiwi club growers, for the Pink Lady apple's producers there is the possibility to send the harvest that does not meet quality requirements to the processing industry. This surely causes a reduction of the price received, even though it contributes to mitigate the risk to not receive any compensation or even a penalty (as reported in the case of the yellow-flesh kiwi club chain).

The level of replaceability of farmers in this case is not considered very high. In fact, the replaceability is influenced by the geographical position of farms. Only those farms located in areas judged particularly suitable for producing at least one of the three clones that can be marketed as Pink Lady® are selected to be part of the supply chain. For this reason, the selection is a careful process, on which the European licensee is directly involved. The selection process takes in consideration the skills of farmers (high level of education, experience in growing apples), but also their reputation. The latter is verified with the direct involvement of POs and cooperatives. Farmers' switching costs are, also in this case, very high. Farmers cannot market the apples through other channels, but they must deliver the entire production to the national licensee. Thus, switching to another buyer is for them impossible.

Despite the high level of coordination exercised by the licensee, farmers are willing to join the Pink Lady® supply chain. Information collected did not allow to quantify how much higher is the price received for the Pink lady® harvest compare to another variety (free or even protected), but farmers seem to achieve higher returns from entering this supply chain and to reduce also the risk, which is, on the contrary, associated with free varieties. Another important factor, however, not to be forgotten, is that farmers in the Italian area of production of Pink Lady® are strongly organised in cooperatives. All the apple production comes, in fact, from producers who are members of cooperatives or POs, which give often precise indications to farmers about which varieties to grow.

6.6 The seedless grapes in southern Italy

6.6.1. Introduction

Table grapes are among the most popular fruits in European consumption. The market for table grapes is mature, with large volumes and a relatively stable demand all year round. With a value of 1.4-billion-euro table grapes have the highest import value after bananas. The import volume

has gradually increased from 602,000 tonnes in 2015 to 694,000 tonnes in 2019 (<https://www.cbi.eu>).

Production of table grapes reaches some 84 million tonnes worldwide (OIV). China is the main producer (14 million tonnes in 2019), followed by Italy (7 million tonnes in 2019) and other Mediterranean countries (Turkey, Spain and Greece), South Africa, Chili, and USA. The main exporter countries of table grapes are Chili and Italy, that together cover 45% of worldwide exports (OIV).

In Italy, table grapes are the main fresh fruit exported. National production is concentrated in Southern regions, with Apulia that covers 70%, followed by Sicily, Abruzzo, Latium, Basilicata, Calabria and Sardinia.

There are many different table grapes available, varying from white green to red and dark blue. In Europe, the seedless varieties are most popular for consumption, such as the white-green Thompson and Sweet Globe, and the red Crimson, Flame Seedless and Ruby. There is a wide range of new varieties, complementing or replacing the older existing varieties. Many of these grape varieties are produced under license. The seeded varieties are in decline, but still widely cultivated and available.

Seedless grapes varieties have become more dominant over the past years and their market share is expected to grow further. The United Kingdom was at the forefront of this development, but now they are the preferred variety in most of northern Europe. For example, the German market is close to 80% seedless grapes. Growers in Spain and increasingly in Italy and Greece have started a transition towards seedless grape production to meet this growing demand.

6.6.2. Seedless grapes production in Italy: protected vs free varieties

In Italy the production of seeded varieties is still dominant, covering 84% of the national production, while seedless varieties covered 16%. Table 8 illustrates the percentages of the main table grapes grown in Italy.

Table 8: Main seeded and seedless varieties grown in Italy

Variety	Percentage on total national production	Variety	Percentage on total national production
Seeded grapes		Seedless varieties	
Italia	41%	Sugraone	6%
Victoria	15%	Crimson	5%
Red Globe	10%	Centennial	1%
Michele Palieri	6%	Thompson	1%
Regina bianca	3%	Sublima	0.5%

Variety	Percentage on total national production	Variety	Percentage on total national production
Seeded grapes		Seedless varieties	
Black Magic	3%	Ruby	0.25%
Matilde	2%	Regal	0.25%
Cardinal	2%	Other seedless varieties	2%
Other seeded varieties	2%		

Source: imaginenetwork.com

Production of seedless grapes in Italy is mainly based on free varieties, even though the most planted one, Sugrone, is a protected variety of Sun World Innovations. Among the free varieties distributed, the most common are those bred under the USDA (United States Department of Agriculture) programmes. The best-known free seedless varieties are: Crimson Seedless, which is the second most grown in Italy, Sublima seedless and South African Regal seedless, which is becoming rather common among producers in Apulia, given its high fertility index. Centennial seedless, Thompson and Ruby seedless are other three free varieties grown in Italy, although they are considered in the international market obsolete and the latter two also need expensive production techniques.

The flourishing of these new varieties, both protected and non-protected, might be considered as an interesting signal of innovation in the sector, however, it has also created confusion among farmers. In Italy, the absence of an official variety register that could provide an accurate overview of the hectares and cultivars grown at national level, prevents producers who want to introduce new varieties from making a rational planning. Sometimes the choice falls on cultivars that in other areas of the world are considered obsolete and underperforming or that are not the more suitable for the characteristics of the land, climate and environment. Moreover, the growing number of new varieties introduced in the industry are protected, thus, accessible only to farmers who pay royalties or who are willing to join a club chain. This picture is further complicated by the practice of unauthorised planting of protected cultivars, which is reported to be rather common; this behaviour risks damaging the reputation of the entire Italian viticulture towards international breeders, with serious consequences for the sector (OIV).

In June 2019 four of the World's leading table grape breeders decided to join forces against the unauthorised production and reproduction of their protected varieties. They created an organisation, "The Breeders Alliance Company Ltd", which includes among its founders: Grapa Varieties Ltd, IFG, SNFL and Sun World Innovations.

Varieties with patent rights can be classified according to the form adopted for the exploitation of the variety. Two are the main schemes adopted:

1. Royalties are paid per plant or per hectare, the payment can be annual or one-off payment.
2. Royalties are paid per plant and on the value of production traded annually.

The second scheme usually encompasses the presence of a club chain.

(1) *Seedless grapes protection schemes based on the payment of royalties.* Protection schemes based on the payment of royalties, as already mentioned above, can be distinguished in two main types:

- a. those based on one-off payment, and
- b. those based on the payment of royalties per plant and per value of product.

Numerous are the varieties that follow these two systems, but the second one seems to be more common, at least in terms of breeders/licensees that decide to use it. The payment of royalties per value of production is often combined with the presence of authorised distributors, who pay on their turn a royalty to the licensees.

The most cultivated seedless varieties in Italy and Apulia, Sugraone of Sun World Innovations, follows a hybrid system. Producers must pay a one-off royalty per plant, but production can be sold only through the 35 authorised distributors, who on their turn pay a royalty to the breeder to sell grapes with the trademark Superior Seedless®. This is the only variety of Sun World which does not follow the club scheme. It is rather spread in the Apulia, and this led the breeder to differentiate the organisation system, to facilitate the production system, given the numerous producers' complaints about the club systems and the several cases of unauthorised use of the variety. The breeder recruits farmers mainly through the involvement of local POs and also offers to producers technical assistance, since the agricultural practices used for seeded varieties are not completely suitable to reach quality standards needed to market grapes with the breeders' trademark.

(2) *Seedless varieties organised as club supply chains.* Currently in Italy the club scheme is adopted by International Fruit Genetics (IFG), Sun World Innovations, Special New Fruit Licensing (SNFL) and AVI. These four breeders operate in Italy through licensees. The nature of companies chosen as licensees goes from exporters and companies specialised in trading to POs and cooperatives; they can be nationally or locally based.

Farmers signed agreements with the licensees that usually includes clauses about quantities to be produced, pricing rules, technical assistance programmes and exclusive rights for marketing the

harvest, that can be traded by authorised distributors or directly by the licensees, that in this case become exclusive buyers. The most part of protected varieties are also registered as trademarks and produce to be marketed with the brand associated to the variety must achieve specific quality standards. In relation to quality requirements, however, interviewees reported that they are difficult to be measured, because of the nature of grapes. It is not clear if these quality requirements are included in the contract, yet all interviewees agreed to consider their achievement and measurements as one of the most relevant issues in the production of seedless grapes. Contracts signed between licensees and farmers are reported to include clauses related to quantities to be produced, since licensees tend to plan their production according to their needs.

The selection of farmers to be involved in the club chains is left to the licensees. The breeder AVI group is involved in the recruitment of farmers, signing a contract with both the licensees and the farmers. AVI' licensees are local POs and few companies specialised in trading, and their knowledge of local producers is used by the breeders to select farmers.

The presence of club chains is the subject of a dispute between producers and licensees. Many producers recognise the positive aspects of the club chains related to the possibility to plan carefully production and to potentially increase income. However, farmers complain about the lack of transparency on contractual conditions and pricing rules. Producers criticise the stronger position that breeders/licensees have in the club chain and the prohibition to sell the produce to the highest bidder.

6.6.3. Identification of the form of governance

Describing the club supply chain in case of grapes resulted complex, because of the lack of information but mainly due to the numerous solutions that are implemented in Italy, and in particular in Apulia. This has been the area mainly considered, being the main producing region at national level.

Two main categories of organisation of supply chains based on seedless grapes can be identified in the area (Figure 6):

1. The first type (type A in figure 6) is based on the payment of royalties that can be one-off payment, a payment per plant, a payment per volume of production traded, or a combination of two of these options. In these supply chains marketing of the harvest is not controlled by the breeder/licensee. It can happen, however, that the harvest is sold by authorised distributors (e.g., Sugraone of Sun World). Farmers might be independent or

POs members. When POs are involved, they take the harvest of their members and then they trade it either through private traders or authorised distributors.

2. The second type is organised as a traditional club supply chain (Type B in figure 6): the variety is controlled by licensees that can be companies locally or nationally based. Farmers sign contracts with the licensees. Usually, contracts include provisions about exclusive marketing rights of the harvest. Farmers can be independent or POs members. In this latter case the harvest is traded by the POs, either with the licensee, which in this case became the unique buyer, or with authorised distributors.

The main differences between the two chains identified lays on the role of the breeder/licensee, that in the first case collect royalties and in the second extend control to the harvest too. A common feature in both cases is the presence of authorised distributors.

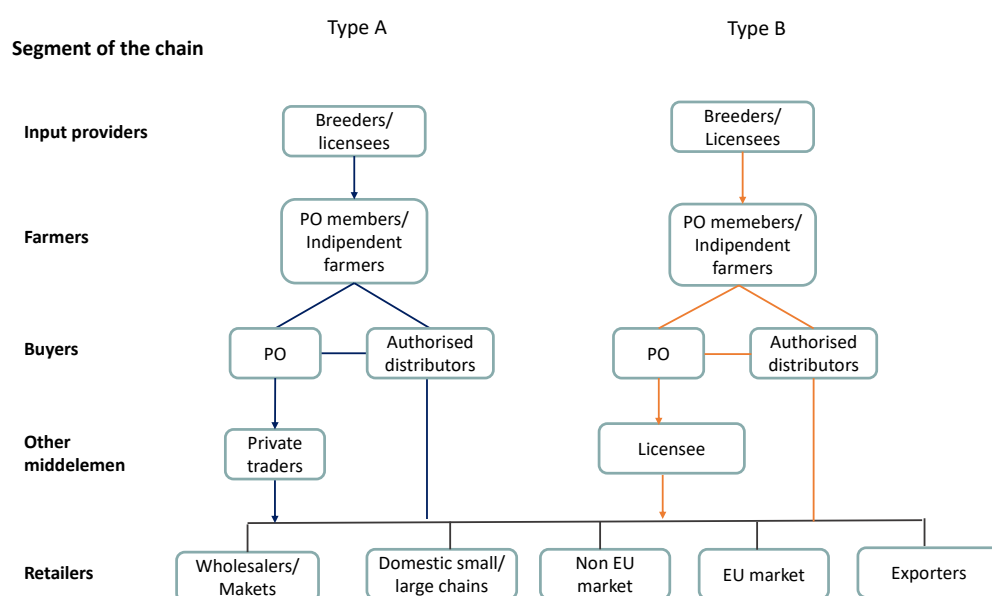


Figure 6: Representations of two possible supply chains in the seedless grapes industry

Identifying the governance model is not straightforward in this case. Type A combined characteristics of the *market* and *modular* types of governance. The relationship is based on a contract, as it happens in the modular type, and it is not free as it would happen in the market type. The contract is equal for all growers and rather simple, since it lays provisions only on the royalties' payment scheme. The complexity of production is high only for unexperienced farmers, which might not be true in this case because all farmers involved are already experienced in the production of seeded grapes. Production standards are simple to be followed by farmers, even though a farmers' tendency to disregard technical assistance protocols offered by breeders/licensees to increase production has been reported. Farmers can be replaced easily, and

this complies with the characteristics of both market and modular types of governance. Switching costs are not particularly high, because farmers are not obliged to trade harvest through the authorised distributors, but they can find other buyers. In Supply chain A there is not the presence of a strong lead firm. The role of breeders/licensees is limited to the collection of royalties, sometimes only from farmers and in other cases also from authorised distributors, but the level of coordination is poor. While this supply chain has some typical characteristics of the market type of governance, such as the low switching costs, the modular governance does seem more appropriate to this case, because of the presence of a contract, the need to follow production standards (even if it is not an obligation) and the easy replaceability of farmers (but also of buyers).

Type B can be considered the captive type of governance, as it usually happens in case of “traditional” club supply chains. However, this case too is peculiar. The contract offered to farmers includes terms decided by the breeders/licensee and farmers do not have room for negotiation. The complexity of the products is high, farmers must follow technical assistance protocols to reach quality standards needed to trade the harvest with the breeders’ trademark. Despite technical assistance programmes are envisaged by contracts, farmers are reported not to be keen to follow indications from advisors in terms of agricultural practices and actions to be implemented to ensure that grapes reach the quality standards required. Farmers have relevant experiences in growing grapes, but not seedless varieties, which are often more complex compared to the seeded ones. Even though the system to transfer information and knowledge is in place, it seems that this does not always work as it should. The level of coordination and monitoring of farmers from licensees appear to be high, but the quality of the relationship between the parties appears to be poor, with a low level of trust. Farmers complain about the club system because it does not allow to sell grapes at the highest price possible, which is rather surprising if taking in consideration what happens in the other two cases examined. In both the kiwi fruit and apple industries, the main driver for farmers to join a club is the higher price received for the harvest in comparison with the prices of free varieties. The farmers replaceability is easy and termination costs are very high. In fact, in this case the breeder/licensee trades exclusively the harvest, as a result, for farmers finding a alternative buyers should be impossible.

Producers in Apulia region are aware about the need to introduce more seedless varieties because the market trends go to that direction. Breeders and licensees, on the other hand, highlight the importance to increase the production of seedless grapes but paying attention to the quality of the production. It is recognised that measuring the quality of grapes is much more complex than measuring it for kiwi fruit and apples, for which it is possible to establish quantitative parameters

that are not suitable in case of grapes. However, breeders argue that the complexity of the production process and the achievement of quality requirements could be overcome by some changes in the agricultural practices, changes that are regularly suggested by advisors to farmers. The reported general reluctance of farmers to follow the advice provided is considered a serious issue that hampers the achievement of high quality in the production.

Furthermore, the need to sell the harvest within a short period of time, could not it be stored, adds complexity to the organisation of the supply chains. Freedom to market the harvest is reported by farmers as key to avoid economic losses, while breeders argue that also this problem could be solved by planning production and diversifying the cultivars grown, to avoid concentrating the harvest in a short period.

6.7 Discussion and conclusions

The analysis of the three case studies aimed to answer to the first two research questions as reported below:

RQ1 – Does a governance model prevail in the club value chains?

RQ2 – Do differences in the organisation of club supply chain influence the governance model?

The three club value chains analysed have been categorised as captive, according to the taxonomy developed by Gereffi et al. (2005). In case of grapes, the categorisation leaves some doubts, given the complexity of the context in which these supply chains grapes are developing. While the typical club chains can be considered as captive in the seedless grapes industry too, this one is characterised also by a number of supply chains based on protected varieties that can be considered modular type of governance. Table 9 summarises the identified characteristics of the chains analysed.

Table 9: Governance type and characteristics of the supply chains based on protected varieties

Sector	Type of governance	Characteristics of the supply chain
Kiwifruit: club chains A and B	Captive	- Detailed contracts: terms are imposed by breeders. - Complexity of the product: high. - Codification of information: knowledge and information are transferred through technical assistance programmes. - Farmers' skills: Farmers are experienced growers but to respects production standards rely on breeders' directions. - Switching costs for farmers: high. - Good level of trust between breeders and farmers - Successful marketing strategies implemented.
Apples: Pink Lady club chain	Captive	- Detailed contracts: terms are imposed by breeders - Complexity of the product: high.

Sector	Type of governance	Characteristics of the supply chain
		- Codification of information: knowledge and information are transferred through technical assistance programmes. - Farmers' skills: Farmers are experienced growers but to respects production standards rely on breeders' directions. - Switching costs for farmers: high. - Good level of trust between breeders and farmers. - Successful marketing strategies implemented.
8. Seedless grapes – club chain	Captive	- Detailed contracts: terms are imposed by breeders. - Complexity of the product: high. - Codification of information: knowledge and information are transferred through technical assistance programmes. - Farmers' skills: Farmers are experienced growers but to respects production standards rely on breeders' directions, which does not always happen. - Switching costs for farmers: high. - Low level of trust between farmers and breeders.
9. Seedless grapes: supply chains based on the royalties	Modular	- Standards contracts equal for all farmers. - Complexity of the product: high - Codification of information: low - Farmers skills: high. Most part of farmers are experienced grapes' growers, but they tend to disregard technical assistance protocols provided by breeders. - Switching costs: low - Low level of trust between farmers and breeders.

In all cases the presence of contracts is an important tool to improve the coordination of the supply chain, but in the kiwi fruit and apple industries these contracts are rather complete and include clear clauses related to quantities to be produced, pricing rules, technical assistance programmes and quality requirements the production must achieve. In the seedless grapes industry, it is not clear if anything specific is said about quality standards, but their achievement is considered an important issue of the industry, on which a better coordination between actors could have a positive influence. As for the other items, also in the club contract of the grapes industry, details about quantities, technical assistance and price definition are specified, but their presence does not seem to ease the relationship between farmers and breeders. In the grapes chain, technical assistance programmes are reported to be often disregarded by farmers. They complain about the rules used to define price, considered not transparent and not convenient for farmers, since prevent them to sell production at the higher prices, and also about the limits imposed for quantities to be produced. On the contrary, farmers in the kiwi fruit and apples industries are willing to join club supply chains, even being aware of the fact that they will lose a great deal of their freedom in terms of farm management, business decisions and market opportunities, because growing protected varieties ensure higher prices than free varieties.

An additional positive aspect reported by farmers in these two industries is the good business relationship terms they have with the breeder, which is usually considered supportive and willing to help in case of problems, even though they recognise that a certain lack of transparency, particularly related to the definition of price and quality, exists. Instead, in the grapes industry it seems that there is no trust between farmers and breeders/licensees, and this contributes to increase the already existing issues.

Another important difference identified in the grapes industry compared to the other two case studies relates to the organisation of the marketing phase. In the kiwi fruit and apple club chains, produce is traded by the breeders according to a scheme very well-known by all actors. In both cases, the presence of a strict monitoring system that ensures the achievement of quality standards and allows to decide the destination of the production, based on the results obtained (e.g., in case of apples, production under certain quality standards is sent to the industry or sold not as top category) helps avoiding problems and misunderstandings. The marketing phase in case of grapes does not appear so well organised. The not rare cases of fraud (vines stolen and production sold with no authorisation) represent an additional complication. The spread of typical club supply chains is limited; most part of protected varieties is produced within the supply chains of type A, based on the payment of royalties, without obligations for farmers to trade the harvest through the breeder/licensee or through the authorised distributors. Farmers can sell their production as generic grapes, without using the trademark of the protected variety. The reason for this might be a better marketing opportunity found by the farmers, but it might also be that the quality standards of the harvest are not appropriate for selling it under the breeders' trademark. This latter situation, considering the production costs (more complex growing techniques and the payment of royalties), might also entail for the farmer a welfare loss. The lack of control of the marketing phase of the supply chain is the main difference identified between the three cases analysed, and it seems also one of the reasons for the lack of economic success of the club supply chains in the grapes sector. The capacity to control all steps of the supply chain, including the marketing phase, allow the breeders in the apple and kiwi industries to control quantity produced and traded, to control quality of the harvest and to set up specific marketing strategies to ensure the development of the variety. Both the yellow-flesh kiwis and the Pink Lady apples have a clear identity in the market, they are recognised by consumers, and this might often ease breeders' negotiations with retailers. In fact, retailers might agree on more favourable contract terms in order to have these products within their references. In the grapes industry, on the contrary, the main schemes used for protected varieties are those based on the payment of royalties instead of the club organisation. This implies that

breeders/licensees cannot fully control the marketing phase. Contracts in these supply chains leave farmers the possibility to trade the harvest, as generic seedless grapes, through other channels. The types of contracts used in the chain can be considered a potential reason why the protected varieties in this industry do not follow the same development pattern identified in the other two industries, despite the growing demand of seedless grapes.

It is, however, important to highlight that the fact that grapes cannot be stored and must be marketed fast after harvesting add complications in the management of these supply chains. Fast deterioration of the products makes it difficult to implement an efficient quality control and verification system and imposes to market the harvest within a short period. Better coordination between farmers and breeders might help to solve these problems, but it is difficult to judge (without additional research) if a thorough and punctual organisation would suffice as a solution for the functioning of the grapes supply chains.

The three club supply chains examined have a very similar organisation, and the governance model appears to be the same. Breeders can benefit from a stronger position compared to farmers. Hence, the club supply chains analysed present unbalance of bargaining power between breeders and farmers. While in the apple and kiwifruit industry this higher bargaining power of a party is mitigated by the trust that characterises the business relationship, in case of grapes there is a low level of trust between the parties and this hampers the coordination of the supply chain and the possibility to benefit from the positive aspects that joining a club supply chains seem to ensure to farmers in the other two cases.

Joining a club supply chains allows to enjoy some benefits, which are usually associated to coordinated supply chains. Starting from the reason why governance matters as explained by Humphry et al. (2001), these benefits can be extending also to joining a club supply chain:

- ✓ Market access. Farmers can access the club market only by joining a club supply chain, being it based on a protected variety. They could have access to the market by growing a new variety for which only the payment of royalties is required, with no control of production or trade. However, this solution would not allow to benefit from the investments that often the breeders do in marketing (it is the case of kiwifruit and apples, and to a certain extent also of some seedless grapes breeders). Despite the lack of statistic and economic data about the development of the club varieties, in the case of the kiwifruit and apple industries higher farm income has been reported as the most important reason to join the club supply chain, even being aware of the unbalance in bargaining power that appears to be common in them.

- ✓ Acquisition of skills. The lead firms in club supply chains are very demanding in terms of quality requirements and agricultural practices, but they provide also technical assistance, and they transfer best practices to growers. This allowed them to increase their skills. This might be an important factor to reduce the possibility that the breeder decides to interrupt the contract. As already highlighted, these supply chains are characterised by higher bargaining power of the breeder, and the presence of high switching cost of one part, usually the farmer, compared to the other. If the breeder decides to end the contract, the termination costs for the farmers will be impossible to be recuperated; the farmer will have to explant the apple or kiwi orchards and he/she might be out of business even for years. It can be argued that, given the complexity of the production, it might be also difficult for the breeder to replace a farmer, but the level of control and organisation of these supply chains might most probably enable the breeder to face the risk of losing a certain number of farmers.

7. Farmers' selection model in a club supply chain: the case of the Agro-Pontino industry

7.1 Introduction

The second part of the research aims to answer to the third and fourth research questions and it relates to the selection of participants in the supply chains, considered as another important function related to the governance framework.

This analysis refers to the kiwi industry in the Agro-Pontino area, where club and non-club supply chains are concentrated in a relatively small territory, considered homogenous in terms of geographic conditions and access to services, enabling comparison between their organisation (Di Fonzo et al. 2019). As already highlighted in the previous chapter, the yellow-flesh kiwi fruit production has been steadily growing in the past decade and breeders recruit farmers regularly (see paragraph 6.4.2 for more details).

The two research questions involved here aims to understand if decisions about participants in the club supply chains follow a specific selection process and if common characteristics link farmers involved. The research questions are formulated as follows:

RQ3 – Do club farmers have distinctive characteristics?

RQ4 – Does farmers' participation to club supply chains respond to specific selection criteria?

Through a logit regression model, it is estimated how farmers' characteristics and specialisation and farm size affect the probability to be selected to join a club value chain.

7.2 Methods and data

The investigation was carried out by using a questionnaire, submitted to farmers, and the use of semi-structured interviews targeting privileged actors involved in different ways in the club supply chains (described in paragraph 1.3.2). The questionnaire was originally built to investigate the relevance of unfair trading practices within club value chains and to compare the difference of occurrence of these practices between club and non-club supply chains. Part of the data collected was used to understand whether there are significant differences between farmers producing free kiwi varieties and those producing patented varieties and which farmers' characteristics can influence their opportunity to join club value chains. The following table shows the questions used for the present analysis (details about the questionnaire are included in chapter 1, paragraph 1.3.2).

Table 10: Data collected with the questionnaire to farmers and used in the present analysis.

Questions used in the analysis
Member of a club value chain
Age
Gender
Level of education (primary school, secondary school, graduation, no education)
Farmers fulltime/parttime
Legal form of enterprise (partnership, individual farm)
Property of the farm
Farm specialised in producing kiwifruit
UAA with kiwi fruit cultivation
Total UAA
Storing facilities
PO or cooperatives membership
Nature of the main buyer
Duration of the business relationship with the main buyer
Better conditions offered by the main buyer
The main buyer takes the entire production
Reputation: the farmer trusts the main buyer
The main buyer is the only one available
The main buyer is the closest
The main buyer provides technical assistance and services

Given the relevance that protected varieties are progressively assuming in the kiwi industry and given the role played by POs in their organisation, the initial hypothesis of the study was that there could be a “farmers’ adoption model” of the club varieties. Breeders appear to be keen to increase kiwi fruit production in the area, being it specialised already in the production of green kiwi and being considered highly suited for growing kiwi.

The initial results of the questionnaire and of the semi-structured interviews highlighted that farmers to become club growers did not have only to candidate themselves, but a form of selection was applied by the breeder, despite the growing production trend and the support that could be provided by the POs and cooperatives in the identification of farmers. As a consequence, the objective was to estimate how the different farmers’ characteristics, specialisation and farm size affect the opportunity to be selected to join a club value chain,

A logit regression model was applied, as follows:

$$\ln(p/1-p) \text{ Kiwiclub} = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Graduation} + \beta_3 \text{Fulltime} + \beta_4 \text{Kiwifarm} + \beta_5 \text{UAAkiwi} + u$$

where the dependent variable “Kiwiclub” is a binary variable which equals 1 when producer is a member of a club chain and 0 otherwise; the regressors, selected on the basis of the results of previous studies (Russo 2020) and of the key-informant interviews, are: age, level of education, extent of the agricultural activity (full time/part time), specialisation of the farm and kiwi Utilised Agricultural Area (UAA) and u representing the random disturbance. The parameters β_i are estimated by the maximum likelihood method. Furthermore, it is estimated the marginal effect on the probability of being a member of a club when regressors changes.

The questionnaire was submitted to 85 kiwi producers in the Agro-Pontino area, 19 of which grow club varieties and the remaining 66 grow non-club varieties. These 85 farmers are representatives of 2.119 kiwi growers in the area considered (2010 Census). Table 11 reports farmers’ characteristics and specialisation and farm size of the selected sample.

60% of the sampled farmers are full-time farmers, 71% are male and only 21% are graduated. Almost half of them are members of a cooperative or of a PO, and 63% are specialised in the production of kiwi. 22% of them grow club varieties, and all these 19 farmers are members of a PO. On average, they are aged 54 years and the kiwi UAA is slightly above 5 hectares.

Table 11: Descriptive statistics of variables used in the analysis.

Statistic/Variable	Age of farmers	UAA (ha)	Kiwi UAA (ha)		
Min.	25	1.50	0.50	Full time farmers	60%
1st Quarter	49	3.80	2.40	Male farmers	71%
Median	57	6.00	3.40	Graduated farmers	21%
Mean	54	11.01	5.29	Kiwi specialised farmers	63%
3rd Quarter	60	8.00	5.00	PO/Coop members	49%
Max.	73	170.00	73.00	Club varieties growers	22%

Source: Elaboration of the questionnaire results

7.3 Results and discussion

Table 12 shows the estimates and marginal effects of the logit regression model. The overall fit of the model, measured by McKelvey and Zavoina R^2 , is 0.897 which represents a very high result for logit estimations, indicating that the variables included in the model explain a relevant part in the selection of the farmers to be included in the club chains. These results are consistent with a selection of farmers by breeders, which had been already flagged in previous studies (Russo 2020). Specifically, full time farmers have 58% higher probability to be included in a club chain, while graduated farmers have 53% higher probability to be selected by breeders than farmers with a lower level of education. Also, the specialisation of the farm is valued as an important characteristic. Farmers growing only kiwi fruit have 20% higher probability to be selected than those producing other fruit varieties, while the size of the farm has less influence on the choice of farmers. Age, on the contrary, negatively influences the possibility to be part of a club chain. Younger farmers are preferred to older farmers as club growers. However, this influence does not seem that important, and this can find an explanation on the average age of farmers being rather high in the area, as in the rest of the country.

Table 12: Results of the logit model

Variable	Coefficient	Std. Error	Significance	Marginal effects
(Intercept)	-3.60101	2.49177		
Age	-0.10470	0.04774	**	-0.0133
College diploma	2.86224	1.28013	**	0.5396
Fulltime farmer	5.25047	1.61305	***	0.5828
Kiwi farms (specialised)	1.83766	0.89101	**	0.2044
UAA kiwi	0.49872	0.21836	**	0.0636

McKelvey and Zavoina $R^2=0.897$

Mac Fadden $R^2=0.405$

n: 85

N: 2,119

The results of the semi-structured interviews helped to select the regressors to be included in the model. Data about farmers' characteristics was available only for the Agro-Pontino area, thus these initial findings could not be verified for the other two industries. However, interviewees confirmed that in the apple industry the European licensee actively participates in selecting which farmers at

national level must grow Pink Lady. Breeders/licensees rely on the knowledge that POs have of their members, but not entirely.

The reasons behind this selection might relate to the fact that despite the willingness of farmers to join club supply chains (as reported by interviewees), breeders are particularly concerned by the need to select the most “fit to the job” farmers. Growing club varieties is usually more complicated. This complexity might be related to agronomic reasons, but it mostly refers to the achievement of strict quality standards. As a result, for breeders the selection of farmers might be compared to an investment related to their future capacity to ensure the needed quantity of product with the appropriate quality requirements demanded by the market. Breeders, however, cannot have the full certainty when they “hire” farmers that they will be able to follow technical assistance programmes and deliver the products with the right characteristics. Breeders can use farmers’ characteristics as “signals” of their “fitness to the job”.

The farmers’ selection might be interpreted as a “market signalling” approach (Spence 1973). Spence applied this approach to the job market, arguing that “in most job markets the employer is not sure of the productive capabilities of an individual at the time he hires him ” (Spence 1973, pag. 356). It is likely that this information will not be available in a short period of time, because the employee might need time to learn the job, and he might also need some training, depending on how difficult the tasks to be performed are. Furthermore, it might be possible that for a certain period of time the employer cannot end the contract. The time the employer needs to understand if the employee has the skills required for the job could be considered as an example of information asymmetry. For the employer hiring is an investment decision made under uncertainty, because employers have imperfect information about the qualities of applicants.

In general, the employer becomes aware of the employees’ skills only after a period of work. What the employer can observe is a number of personal characteristics and data of individuals he would like to engage - such as age, sex, education, work experience, race - and he must rely on them to make his decision about the selection. Spence (1973) divides these characteristics in two groups, based on the possibility for the individual to influence them. Those attributes that cannot be changed, such as sex, race or age (the latter changes but independently from the person) are referred to as *indices*, while *signals* are the observable characteristics that can be manipulated by the individual, such as education or work experiences. Spence argues that “on the basis of previous experience in the market, the employer will have conditional probability assessments over productive capacity given various combinations of signals and indices” (Spence 1973, pag. 357).

Employees cannot do much about the indices, but they can modify the signals, making some adjustments on their situation, and this poses a problem of reliability of the signals, although modifying them might be expensive. Costs supported to modify a signal are defined as *signalling costs* and they assume importance in relation to the reliability of a signal. Spence argues that signals whose production costs are negatively correlated with the quality of the applicants can be reliable signals. Taking education as an example of an important signal, Spence assumed that high-quality employees acquire education rather easily compared to low-quality employees. If the employer believes that education is a reliable signal of skills and competences possession will offer higher wages to educated employees, and these will invest in their own education. Low-quality employees, on the contrary, will not invest in their education because their costs will be too high to be faced.

If the signalling theory is transposed to the club supply chains and the breeder is seen as the employer and the farmers as the employee, the same problem of information asymmetry could apply. Breeders are not sure that farmers selected possess the right skills; they can end the contract, but this might bring negative consequences, because of the time needed before the farm selected starts producing. If the selection process fails in a relevant number of cases, the breeder might find himself in the position of not fulfilling the market demand. Breeders, knowing the complexity of the club variety to be produced, will select farmers with a certain combination of observable indices (age, sex, POs or cooperative membership) and signals (education, work experience, size of the farm).

The results of the analysis confirm that breeders oriented their choices following signals such as education, work experiences and professionalism (being a full-time farmer). This strategy has been confirmed by interviews with breeders, which acknowledged the existence of a selection process, where education and experience of growers are valued as positive signals.

The data collected both with the questionnaire and the interviews also indicate as relevant in this selection process the role of POs and cooperatives. They are involved in the selection process and, in at least one of the two club supply chains analysed in the Agro-Pontino area, farmers involved in it are all POs' members. The involvement of POs might be considered as an additional strategy to mitigate this risk for breeders. As already highlighted above, POs and cooperatives know their members and they might have a rather precise idea of which farmers are more skilled. The involvement of them relates also to issues such trust and reputation, that become more relevant in the in the perspective of a long-lasting business relationship, and of course can assist breeders in correctly "reading" growers' signals.

7.4 Conclusions

This investigation supports the conclusions that breeders apply selection criteria to recruit growers in the club value chains (RQ4), despite their need to attract more farmers, given the growing demand of yellow flesh kiwi. Cultivating protected varieties, though, entails following and meeting specific quality requirements, and this might need for farmers to modify agricultural practices and to invest for modernizing their farms' structures. Breeders seem to consider that professional farmers with a higher level of education might ensure production standards of club varieties. Finding farmers who want to join the system might not be difficult; on the contrary, many farmers would like to join a club chain, being the contractual conditions offered by breeders more favourable than those usually offered for non-protected varieties. For this reason, breeders consider rather important the farmers' selection process, and they base it on the identification of specific signals, such as professionalism and education, which are associated with farmers' higher productivity and capacity to fulfil the quality requirements.

No detailed economic data is available to measure farm income from yellow-flesh kiwi production compared to the green kiwi. Information about farm income was not filled in by farmers in the questionnaire. However, POs and cooperative managers interviewed agreed on the fact that protected varieties allow, at least, to double farm income. This information would need to be confirmed by a quantitative analysis that could allow a comparison with income of free varieties growers. This might be the subject of future research on this topic.

Because of the abovementioned results and arguments, the model has been defined as a "farmers' selection model" rather than a "farmers' adoption model" of a club variety, as for the initial hypothesis formulated. Farmers might be willing to join a club value chain but, considered the strict quality criteria the final production must meet and the need to adapt agricultural practices, not all of them have the same chances to be accepted. This fact makes it even more important to select the more suitable farmers for the job.

The study has some important limitations. The high level of reticence of respondents and the difficulty to find farmers and other actors available for interviews reduced the amount of data to be used in the analysis. The lack of previous studies on this topic and the lack of economic data about the spread of club varieties complicated the analysis. Another limitation of the study is that it refers only to the Agro-Pontino area and does not consider other areas at national level and abroad where yellow-flesh kiwi is grown, even though the area of the Agro-Pontino was chosen because of its homogeneity.

These results support the conclusion that further and more specific criteria and conditions might be set up by breeders to engage farmers. Additional research would be needed to better define these criteria and understand the farmers' position and perspective in the club supply chain, given the importance that they are assuming in the fruit sector. Additional research to quantify the differences in terms of farm income between club and non-club growers, to be extended also to other industries, might give important insights to judge the functioning of this supply chains and to understand if the limitations that farmers must accept to be part of them are balanced by an increased farm viability.

8. Unfair trading practices in club and non-club value chains: the case of the Agro-Pontino Kiwifruit

8.1 Introduction

The final part of the research refers to the third function the governance modes perform in relation to supply chains, that is the distribution of value among participants, which links to the exposure of some participants to potential unfair practices. The research focuses on the potential raise of unfair commercial practices, as indicated by the research question, formulated as follows:

RQ5 – Are club farmers more subjected to restrictive practices than producers of free varieties?

As already highlighted in the initial part of the work, the main concerns raised by the use of club varieties, in fact, relate to the unbalance of power that they create along the supply chain. Breeders control quantities produced, by whom they are produced and the trade of club varieties. If breeders claim the marketing rights, they are at the same time monopolist of the club variety and monopsonist of the harvest. In this situation, breeders have stronger bargaining power than buyers of free varieties, and unbalance in bargaining power is considered to set the ground for unfair trading practices to emerge (Falkowski et al. 2017; Russo 2020; Russo and Simeone 2017).

Nevertheless, anecdotal evidence and previous literature (Di Fonzo et al. 2019) found that club growers achieve higher profits and have better trade terms than others. Given the extreme bargaining power of club breeders this result is unexpected. The case study on the Agro-Pontino kiwi industry has been used to explore the differences between club and non-club supply chains.

8.2 Case study description

The yellow-fresh kiwi fruit supply chain is considered the typical club value chain. Furthermore, the Agro-Pontino area is particularly suitable for the production of kiwi and allows to observe the functioning of club and free supply chains, in terms of occurrence of unfair trading practices.

Chapter 6 illustrates already in details the kiwi fruit supply chain. However, it seems important to recall here the main features of its organisations, including additional details about the supply chains based on free varieties that have been observed in the area and that have not been previously described.

Figure 7 shows the representation of four different supply chains identified in the Agro-Pontino area, but they can be extended also to the other production areas of kiwi in Italy. This

representation differs from that presented in chapter 6 because it includes also the supply chains based on free varieties.

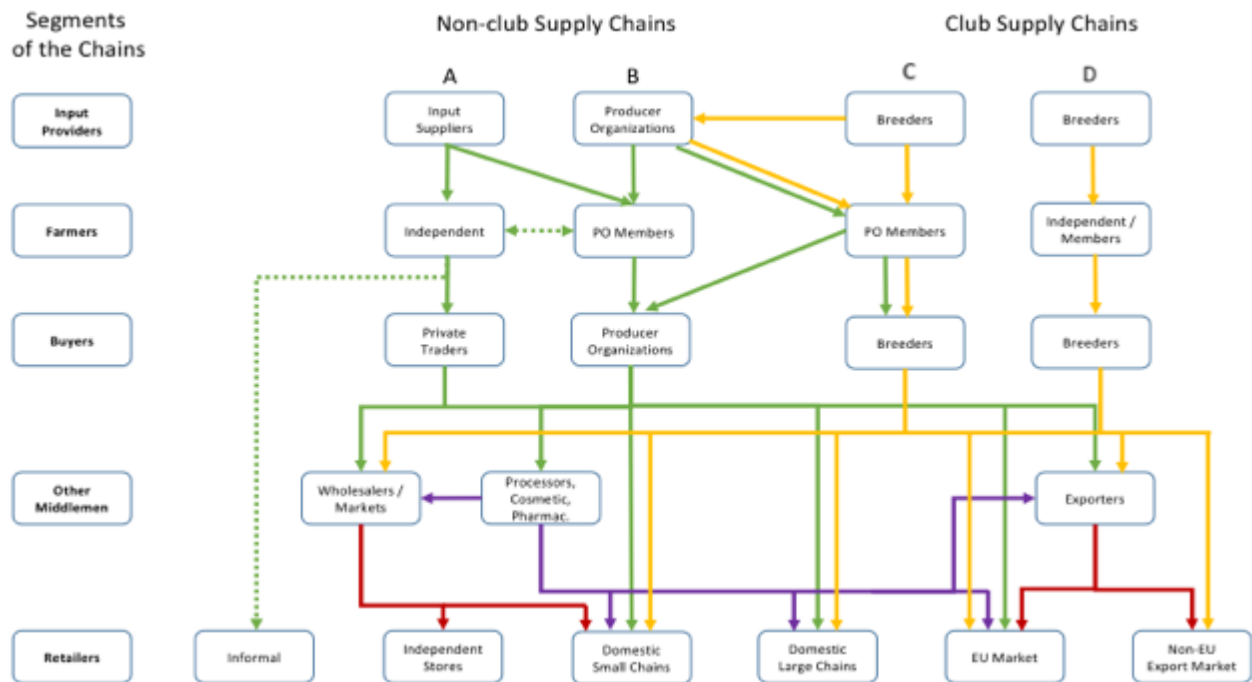


Figure 7: Representation of the kiwi supply chains

Source: Russo, 2020.

Green arrows refer to trade flows of non-club varieties, yellow arrows to club varieties, purple to processed products, red to trade flows of all types. Dotted lines indicate informal trade flows.

Club supply chains are focused on patented varieties (the right part of the figure and the yellow arrows). At least two club supply chains can be identified. For detailed description of them see chapter 6, paragraph 6.4.2.

The two supply chains based on free varieties are differentiated by the nature of buyers. In Type A, harvest is bought by private traders, while in type B the buyer is a PO, that collects the harvest of its members.

The main difference among the four types of supply chains identified lays on the nature of the buyer but relationships among them exist. The most evident relates to the role of POs; they can be licensees, and then buyers, in type D of the club chains, or in type C they work in close collaboration with the breeder. The same POs may grow also green flesh kiwi and, as such, being important actors also of the non-club supply chains. No detailed data exists about the quantities traded by POs and other actors. However, experts' estimates assigned approximately 70% of the traded products to POs, 20% to private traders and 10% to other channels (Russo 2020).

8.3 Data and methods

The analysis focuses on the club supply chains of the kiwi industry in the Agro-Pontino area in Italy and considers closely the relationship between breeders/licensees and farmers.

The questionnaire was submitted to a sample of 85 farmers, representative of the 2,219 kiwi growers of the Agro-Pontino (2010 census data); 66 interviewees grow free kiwi varieties and 19 grow club varieties. Within the 19 club growers, 12 also grow free varieties; during the interview the difference between club and non-club practices was highlighted. The aim to provide a quantitative assessment of the UTP occurrence. The sample was stratified by orchard size and proportional weights were computed. Within each stratum, observations were randomly selected. First, a municipality was drawn randomly and then a farm was selected. In the frequent case that the farmer selected refused to participate, another farm in the municipality was chosen.

The test was not extended to the entire list of UTPs but four key areas were identified and become the focus of the analysis, namely: price determination, quality determination, access costs and renegotiation/retaliation. For each area a set of questions was submitted, and interviewees were asked to agree or disagree to them on a 5-point Likert scale. Most interviewees did not accept to participate (and they were replaced) and some other showed a significant reticence to answer to questions. The questionnaire focused on the transaction between the respondent farmer and the ‘main buyer’, defined as the one buying the largest share (in value) of kiwifruits. The rationale of this approach is that UTPs are transaction specific. Therefore, the measurement must refer to a specific trade-relationship. Table 13 reports the items investigated in the identified issues.

Table 13: Items investigated in the farmers survey. Farmers were asked to agree or disagree to the statement on a 1 (totally disagree) to 5 (totally agree) Likert scale.

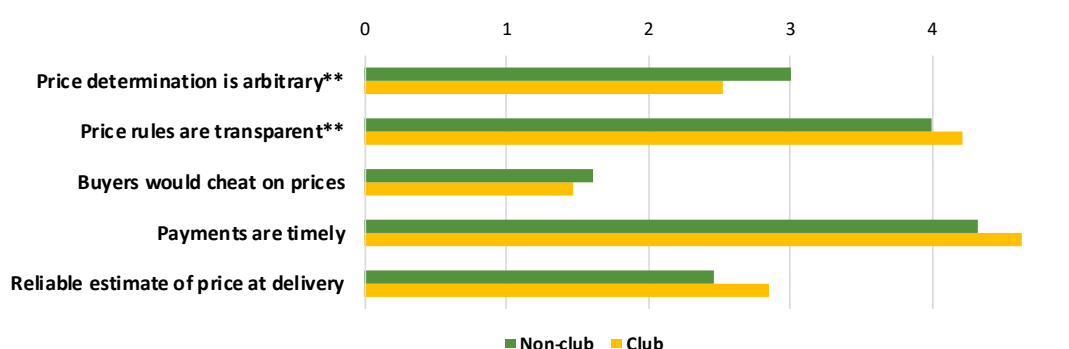
Areas of investigation	Questions
Price determination	Price is based on quality Price is based on market conditions Price is based on time of harvesting Price is based on quantity delivered to the buyer Prices have a variable and fixed component Other criteria to determine prices Pricing rules transparent Price determination is arbitrary Reliable estimation of price at delivery Payments are timely Suppliers must insist for being paid Prices are lower than expected Prices are higher than expected Prices are transparent Buyers would cheat on prices if they could
Quality determination	Quality requirements are clear Quality testing rules are clear Quality testing rules are arbitrary Suppliers can see the quality test results Suppliers can retest the quality Quality determination is transparent Buyers would cheat on quality if possible
Access costs	Access cost are high Sell to the main buyer is becoming more costly Access requisites change overtime Investments are specific Costs are clear before starting production Future costs are clear Buyers require unnecessary investments
Negotiation/ Retaliation	Business is predictable Buyers might take advantage from exceptional events Buyers modify the contracts terms to their own interest The contract terms are vague Buyers always keep promises It is important to avoid conflicts with buyers Buyers are willing to help I gave up contracts right to preserve trade relationship

8.4 Results

The average Likert scores for club and non-club farmers were calculated. The analysis found that statistically significant differences exist in the average Likert scores between club and non-club growers. The following figures show the results of this analysis; they include the answers to the questions considered more relevant and those where statistical difference was identified.

8.4.1 Price determination

Figure 8 shows the results for the questions on the determination of price. On average payments are considered to be timely by both categories, which also disagree about the possibility the buyers would cheat on prices if they could. The transparency of rules to determine prices scores better in club growers than non-club ones, and the same applies on the discretion on determining prices.

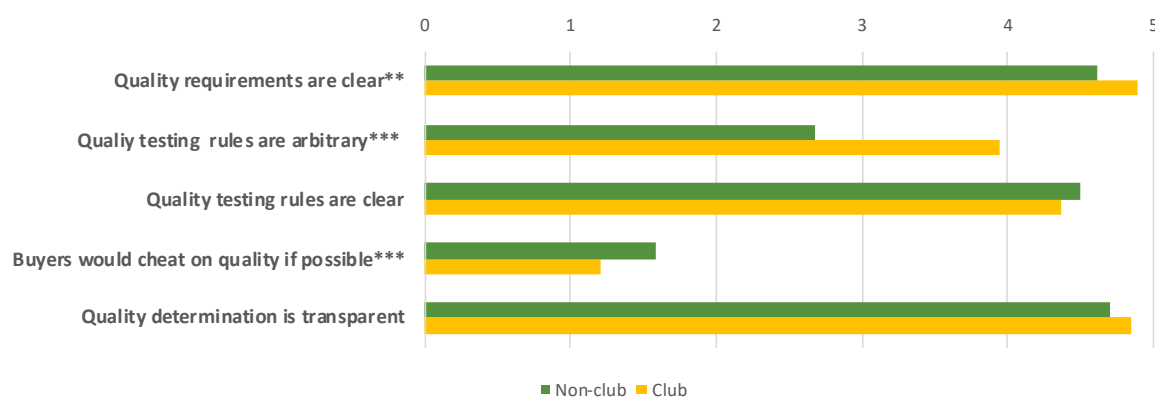


* the mean values of club and non-club growers are statistically different at 90% confidence level; ** the mean values of club and non-club growers are statistically different at 95% confidence level; *** the mean values of club and non-club growers are statistically different at 99% confidence level.

Figure 8: Survey results – Price determination (average scores on a 5-point Likert scale, with 1 = strongly disagree and 5 = strongly agree).

8.4.2 Quality standards

Quality standards (figure 9) are clearer for club growers than for non-club ones. Rules used for testing quality are considered clear, but club growers are more likely than non-club growers to agree on their arbitrariness. Non-club growers are more likely to agree on the possibility that buyers might cheat on quality if they could.



* the mean values of club and non-club growers are statistically different at 90% confidence level; ** the mean values of club and non-club growers are statistically different at 95% confidence level; *** the mean values of club and non-club growers are statistically different at 99% confidence level.

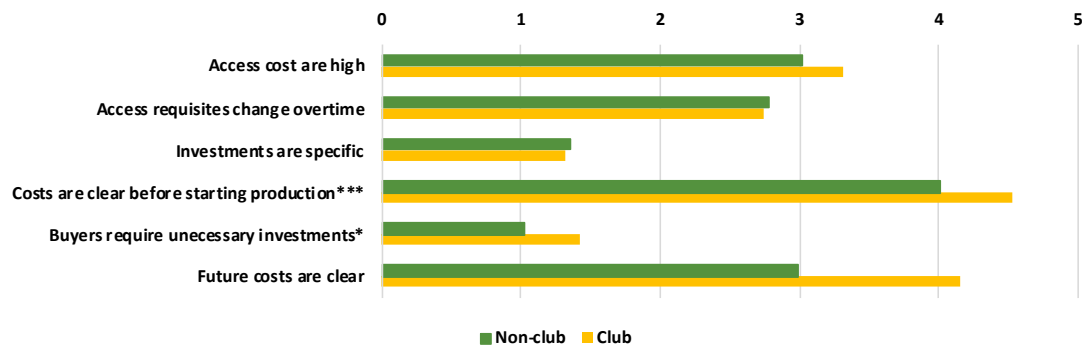
Figure 9: Survey results – Quality standards (average scores on a 5-point Likert scale, with 1 = strongly disagree and 5 = strongly agree).

8.4.3 Access costs

Growing patented varieties might require specific investments and changes in the agricultural practices and farm management. This is caused by the importance that reaching quality standards have for club varieties. The most common example is the yellow flesh variety produced by Zespri, which has to respect specific quality parameters to be marketed. Zespri provided farmers with technical assistance to reach these parameters, but they imply also a commitment for farmers, and this might be traduced in additional costs for them.

Club producers are more likely to agree on access costs to a club supply chain being higher than non-club growers (figure 10). However, club farmers are also more likely to agree on the fact that costs are known when the production starts and that they are rather clear also for the future.

In relation to the specificity of investments there is not substantial differences between club and non-club growers, even though club growers are more likely to agree on the fact that buyers might ask unnecessary investments, even if this occurrence seems to be rare (the means valuer are rather low in both cases).

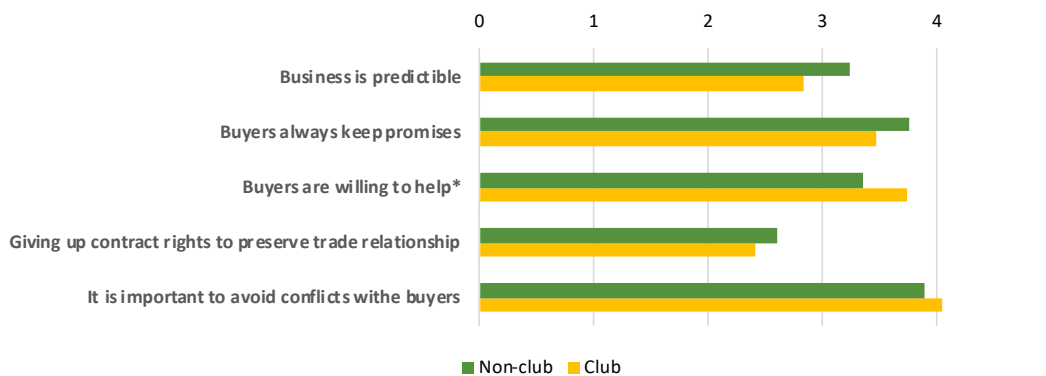


* the mean values of club and non-club growers are statistically different at 90% confidence level; ** the mean values of club and non-club growers are statistically different at 95% confidence level; *** the mean values of club and non-club growers are statistically different at 99% confidence level.

Figure 10: Survey results – Access costs (average scores on a 5-point Likert scale, with 1 = strongly disagree and 5 = strongly agree).

8.4.4 Degree of cooperation and conflict

Club growers think more frequently than non-club growers that buyers would help in case problems arose. There not seem to be substantial differences in the quality of the relationship and the degree of conflict between club and non-club growers (figure 11).



* the mean values of club and non-club growers are statistically different at 90% confidence level; ** the mean values of club and non-club growers are statistically different at 95% confidence level; *** the mean values of club and non-club growers are statistically different at 99% confidence level.

Figure 11: Survey results – Degree of cooperation and conflict (average scores on a 5-point Likert scale, with 1 = strongly disagree and 5 = strongly agree).

8.5 Discussion and conclusions

The analysis supports the conclusions that club growers are not more exposed than non-club growers to unfavourable conditions, despite the higher power that breeders/licensees, which are also the buyers, have in club supply chains. Prices estimate and determination are not significantly different in the two supply chains; breeders do not abuse of their power to cheat on the determination of prices or to postpone payments. The relationship between farmers and breeders seems to be more collaborative in the club supply chains, since breeders are reported as willing to help in case of problems.

Some negative aspects were identified. They refer to quality determination and investments required by breeders. In the first case, the rules to test the quality of the production are considered arbitrary. While the quality standards are very well known by growers and they receive technical support to reach them, testing of quality seems to leave to breeders the possibility to take decisions on which farmers do not fully agree and that have little opportunity to change. Another negative aspect refers the request from breeders of unnecessary investments to join the club supply chain, thus increasing access costs.

Despite the few aspects about which conditions of club growers are less advantageous than non-club growers, overall contractual conditions of club growers are either the same or more favorable than non-club growers, and this contradicts the expectations raised by the unbalance on bargaining power that seems a characteristic of the club chains, where the property rights holder fully controls all steps of the supply chain, from the provision of genetic materials to the marketing of the harvest.

Demand for club varieties has been growing constantly in the past decade; breeders need to recruit more farmers and particularly farmers who can successfully engaged in producing according to the quality standards decided for the variety. Farmers are aware that access costs might be higher than those of non-club varieties, but they also know the estimate of future profits. The net value must be high enough to justify the risk to enter a captive supply chain, fully controlled by the breeder. The estimate of future profits is done by looking at the profit that club growers make, and this might also be an incentive for breeders to grant favourable contractual conditions to farmers, in order to attract additional farmers. This mechanism works as far as the club varieties demand grows, because breeders need to increase production. However, how the situation can evolve in the long run is more difficult to predict. It can be possible that if the club variety demand reaches a steady state or starts decreasing, the breeders will stop offering favourable conditions or might decide to end the contractual relationship with farmers. Thus, in the long run the relationships

within the club supply chains might deteriorate. However, given the full control breeders have of the club supply chain, they control production. The results of the semi-structured interviews lead to think that breeders might decide to keep offer lower than demand and this would allow to avoid the deterioration of the relationship with farmers. Furthermore, breeders run constantly research and development programmes to improve the existing varieties and start the production of new ones, following consumer trends.

9. Conclusions

The present work aimed to analyse the organisation of the club supply chains in the fruit sector, using the governance framework and taking in consideration that the governance modes (i) drive the coordination between partners, assigning functions and tasks to them, (ii) select participants and (iii) set-up the rules to distribute the value among partners along the chain.

The evolution of the fruit sector as a relevant “user” of protected varieties brought to consider the relevance to better understand the organisation of club supply chains and the potential consequences that this might have on farmers. The five research questions identified link back to the governance framework mentioned above.

RQ1: Does a governance model prevail in the club value chains?

RQ2: Do differences in the organisation of club supply chains influence the governance model?

RQ3: Do club farmers have distinctive characteristics?

RQ4: Does farmers’ participation respond to specific selection criteria?

RQ5: Are club farmers more subjected to restrictive practices than producers of free varieties?

Results and conclusions have been already discussed for each of three part of the research. This chapter aims to briefly summarise those conclusions, identifying specific findings, and to provide some additional reflections.

9.1 Club supply chains and governance models

The analysis of the governance model started from three case studies referring to three industries where the club varieties are particularly relevant, that is the yellow-flesh kiwifruit, the apple Pink Lady and the seedless grapes. These three industries have been selected for specific reasons:

- ✓ The Pink Lady apple can be considered the first supply chain organised as a club chain and the long-lasting. It started its activities in the 1990s and it is still considered the most successful club variety in the apple sector, despite the increasing number of other protected varieties appeared in the market in the last decade and organised as club supply chains.
- ✓ The yellow-flesh kiwifruit in the Agro-Pontino area is in a developing phase. The production of yellow-flesh kiwi has increased considerably in the last six years.
- ✓ The seedless grapes industry is also facing a developing phase. The demand for seedless grapes is increasing constantly and also the number of protected varieties at farmers’ disposal.

The taxonomy developed by Gereffi et al. (2005) has been the basis to conduct the analysis of the governance model.

F1: The captive governance model prevails in the club supply chains analysed.

The supply chains organised around patented varieties and according to the club formula share the same governance model. In the seedless grapes industry numerous are the patented varieties grown but different are the exploitation systems. Those chains that follow the club formula have been categorised as captive, while those using different exploitation system (e.g., based on royalties) have been considered closer to a modular type of governance.

The means used by this governance model are contracts. They are reported to be rather complete, including detailed clauses about quantities to be produced, pricing rules, technical assistance programmes and quality requirements the production must achieve.

The presence of trust and attention to reputation are key elements in the relationship between breeders and farmers, despite the strict control and monitoring system implemented by breeders.

Differences in the efficiency of the club supply chains have been identified, albeit the governance model corresponds in the three industries. Specifically, in the seedless grapes industry several issues have been reported in the organisation of the supply chains. Relationships between the breeder and farmers are often difficult and trust is not common as it happens in the other two industries. Difficulties have been reported in the achievement of the quality standards required to trade produce with the breeders' trademark, despite technical assistance is provided to farmers. Major complexity in the production process, the impossibility to store the harvest and, as a result, the need to market it fast represent two important differences between the seedless grapes and the other two industries. Furthermore, these factors are reported to increase the complexity of achieving quality standards and the set-up a control and monitoring system of the production process, as it happens in the other two industries.

F2 – Differences in the organisation of the supply chain, in particular of the marketing phase, seem to correspond to different governance models.

As for the second research question related to the governance model, the analysis here suggests the influence of different organisation settings to the governance model. Additional research would be needed, however, considering that this finding is mainly based on the seedless grapes supply chains, that proved to be more complex than those identified in the other industries. The main organisational difference has been identified in the marketing phase. When the breeder does not control this phase of the chain, then the governance model tends to switch to modular associated

with a system where contracts are not detailed, farmers are asked to pay royalties and they can market the harvest through different market channels, not having any obligation to deliver it to the breeder.

Additional investigations would be needed to better understand if changes in the organisation can affect the governance model in the club supply chains. The possibility to analyse the contracts signed between breeders and farmers would probably help to shed some light on the matter.

9.2 Access to club supply chains: rules for participation and distribution of power

Deciding who are the participants of the supply chain is another important item linked to the governance framework. The analysis of farmers' characteristics referred to the kiwifruit industry in the Agro-Pontino area.

F3: Breeders recruit farmers through the application of a farmers' selection model.

F4: Club farmers can be considered to have different characteristics compared to non-club farmers.

This investigation supports the conclusion that breeders apply selection criteria to recruit growers in the club value chains, despite their need to attract more farmers, given the growing demand of yellow flesh kiwi. Cultivating protected varieties, though, entails following and meeting specific quality requirements, and this might need for farmers to modify agricultural practices and to invest for modernizing their farms' structures. Breeders seem to consider that professional farmers with a higher level of education might ensure production standards of club varieties. Finding farmers who want to join the system might not be difficult; on the contrary, many farmers would like to join a club chain, being the contractual conditions offered by breeders more favourable than those usually offered for non-protected varieties. For this reason, breeders consider rather important the farmers' selection process, and they base it on the identification of specific signals, such as professionalism and education, which are associated with farmers' higher productivity and capacity to fulfil the quality requirements.

Data collected through the survey submitted to farmers confirms that club farmers are slightly different compared to non-club farmers: they are younger, better educated, specialised in growing kiwi and full-time farmers.

These conclusions are confirmed by the interviews of key actors of the apple industry, where the existence of a selection process has been confirmed.

F5: Club farmers seem to be less exposed to UTPs than non-club farmers

The analysis on the occurrence of UTPs refers to the kiwifruit industry in the Agro-Pontino area. The analysis supports the conclusions that club growers are not more exposed than non-club growers to unfavorable conditions, despite the higher bargaining power that breeders/licensees have in club supply chains. These favorable conditions might be related to the development phase the kiwi industry is experiencing. Breeders need to recruit farmers to be involved in the club supply chains; farmers know it and they are also aware, from the experience of other club farmers, of the fact that breeders offer more favorable contractual conditions. Despite the need to select farmers, that can exclude those considered less suitable for growing the club variety, breeder continue recruiting additional farmers and offer good economic conditions. This mechanism works as far as the club varieties demand grows, because breeders need to increase production. However, how the situation can evolve in the long run is more difficult to predict. It can be possible that if the club variety demand reaches a steady state or starts decreasing, the breeders will stop offering favorable conditions or might decide to end the contractual relationship with farmers. Thus, in the long run the relationships within the club supply chains might deteriorate. The results of the interviewees for the apple sector, however, might drive to think that the organisation of the club supply chain and the presence of a strong marketing strategy for the development of the club chain, combined with constant use of research and innovation to improve the club variety, might overcome the possibility of deterioration of the club supply chain in its phase of maturity.

9.3 Additional reflections: possible regulatory issues and study limitations

Club supply chains appear to be a convenient compromise for farmers. A trade-off seems to exist between a reduction of their freedom in terms of business management and improved economic performance. The more developed examples of club supply chains analysed (apples and kiwifruit) allow to programme production quantities, to control and respect quality standards recognisable and appreciated by consumers, to ease negotiations with retailers. Farmers must sign detailed contracts and follow strict rules to be part of these supply chains, but they increase their income, they are assisted by breeders in case of problems during the production process, and they have the certainty to sell the entire production, provided that quality criteria are met. Interviewees also estimated that the value of agricultural land cultivated with yellow-flesh kiwi doubled, at least, in the Agro-Pontino area. Finally, also concerns related to the exposure to unfair trading practices of

farmers involved in these supply chains does not seem to be justified. However, despite all these positive considerations, an issue seems to remain still unsolved, that related to the risk that the contract is terminated, and the farmer is obliged to exit the club chain. If a similar event occurs the costs for farmers would be rather high, being the harvest marketed only by the breeder, the farmer would be immediately out of market. The content of contracts could not be analysed. However, not protection clauses against this risk for farmers have been reported to be included in the contract. As a result, a potential regulatory intervention to limit this risk for farmers and to reduce the seriousness of its consequences could contribute to improve the functioning of these club supply chains, protecting at the same time farmers' position.

The study has some important limitations. The high level of reticence of respondents and the difficulty to find farmers and other actors available for interviews reduced the amount of data to be used in the analysis. The lack of previous studies on this topic and the lack of economic data about the spread of club varieties complicated the analysis. Another limitation of the study is that the analysis about the selection model and the occurrence of UTPs refer only to the Agro-Pontino area. Submitting the survey to a representative sample of farmers of the apple and grapes industry it would have allowed to better understand the selection model, the position of farmer and the occurrence of UTPs.

An additional weakness of the study is the lack of economic data to measure farm income in club and non-club chains, which reduces the possibility to draw some policy implications, considering that the spread of the club formula is increasing in the fruit and horticulture industries. Information about farm income was not filled in by farmers in the questionnaire. However, POs and cooperative managers interviewed agreed on the fact that protected varieties allow, at least, to double farm income. This information would need to be confirmed by a quantitative analysis that could allow a comparison with income of free varieties growers. This might be the subject of future research on this topic.

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