

**On the Nature of a Cooperative:
A System of Attributes Perspective**

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Abstract

In the 1950s and 1960s there was a debate about the nature of an agricultural cooperative: the cooperative as extension of the farm, the cooperative as vertical integration or the cooperative as a firm. We revisit this debate with various concepts from the theory of the firm that have been formulated since 1990. Two concepts shed light on this debate: the enterprise as a system of attributes and the delineation of a governance structure in terms of ownership rights, control rights and income rights. It is argued that viewing the cooperative as a system of attributes integrates these three views. It emphasizes that a cooperative is a firm in itself, with many input suppliers as owners. The feature of many input suppliers as owners implies that the behavioral differences between a cooperative and an investor owned firm have to be addressed by highlighting the unique aspects of the stakeholder owning the enterprise.

Introduction

A widespread and important governance structure in many agricultural markets is the cooperative. For example, the European Union has 132,000 cooperatives with 83.5 million members and 2.3 million employees in 2001 (Commission of the European Communities, 2001), the United States of America has 47,000 cooperatives with 100 million members in 2001 (USDA, 2002), and China has 94,771 cooperatives with 1,193 million members in 2002 (Hu, 2005). In the EU, cooperative firms are responsible for over 60% of the harvest, handling and marketing of agricultural products, with a turnover of approximately 210,000 million euros (Galdeano, e.a., 2005).

An agricultural producer cooperative is an association of independent members who jointly own a downstream processor (Sexton, 1984). When a group of farmers form a cooperative, they agree mutually to set up a downstream enterprise and operate it jointly as an integral part of their individual firms. An essential feature of the cooperative is the ownership by the members over the downstream assets. Farmers not only hold formal authority and take responsibilities over the downstream enterprise, but also share the costs and revenues as residual claimants. They are, meanwhile, independent, in the sense that they do not necessarily collaborate or coordinate with each other on other aspects of their individual farm enterprises.

The alliance among all parties involved in a producer cooperative can be split into two parts. One is the horizontal relationship among the members who grow produce and then deliver them to the downstream stage. A cooperative in this aspect resembles an output association. An agricultural output association either grades, packages, handles, and stores the products of many farm enterprises together; or bargains, negotiates and contracts as a big unit with processors or retailers with respect to the processing, shipping or marketing of the output. By forming an association, part of members' assets and activities are combined together: they coordinate in some dimension, and meanwhile maximize independently the profits of their own farm enterprises. What distinguishes a cooperative from an output association is the second element of the alliance, the vertical relationship between growers and processor. On the one hand, the members possess residual rights over the processor. Collectively, they own the cooperative and make vital decisions upon important issues regarding it; they incur also the costs and share the residual rights over its capital and profits. On the other hand, the growers act also as the

patrons of the processor by providing inputs. Members of cooperative are entitled to priority access so that the processor is not allowed to reject their produce.

The nature of an agricultural cooperative has been debated ever since the 1950s and 1960s. There is substantial literature on the issue and significant contributions have been published about the cooperative being an extension of the farm, vertical integration, or an enterprise (Robotka, 1947; Phillips, 1953; Savage, 1954; Trifon, 1961; and Helmberger & Hoos, 1962 among others). The extension of the farm view maintains that the cooperative is just an association of firms, not a new firm per se; it has no entrepreneurial unit (Phillips, 1953). With this conception of the cooperative, all of the attention is centered on (the entrepreneurs of) the member firms. The interdependencies between the various activities in the portfolio of a farm enterprise are thus highlighted. The firm view advocates that a cooperative is itself a business enterprise and an economic entity, and a new decision-making body is created by the formation of a cooperative (Robotka, 1947, p103; Helmberger & Hoos, 1962, p290). It looks upon a cooperative as a special type of firm capable of making entrepreneurial decisions just as any private corporation (Savage, 1954). The characteristics of an economic unit set up by cooperative members (for example, a processor) as an enterprise are stressed. The vertical integration view advocates the view that member firms are integrated in the sense that several stages in the production process are brought under one entrepreneurial control (Phillips, 1953, p79; Sexton, 1986). Therefore the interaction and vertical relationship between two stages of production (e.g., upstream farm and downstream processor) becomes the focus of analysis, usually with one upstream and one downstream party.

The emergence in the late 1980s and the 1990s of new concepts in the theory of the firm

may provide an opportunity to reconsider the nature of cooperative. This may be valuable for the standard reasons. Applying new concepts to cooperatives may result in new propositions about cooperatives. These propositions can be used descriptively, i.e. confront them with data, or they can be used prescriptively, i.e. formulate advice for either cooperatives or public policies. Cooperatives may benefit because these concepts may be helpful in addressing a variety of issues, like member commitment, transfer prices, sourcing, restructuring, and diversification. It may assist in formulating public policies, particularly competition policies that may either grant cooperatives a special status, or classify them as anti-competitive in terms of a cartel or a vertical restraint. Recent discussions on the legal status of cooperatives in the European Union are an illustration (Menard, 2007). Therefore, we revisit this debate with concepts that have been formulated since 1990.

Two concepts are highlighted: the enterprise as a system of attributes and the delineation of a governance structure in terms of ownership rights, control rights and income rights. The system of attributes view proposes that organizations are composed of attributes. Each attribute represents a certain aspect of the organization. The systemic effects are stressed because the payoff associated with the level of one attribute depends on the level of all the other attributes. Attributes are therefore interdependent. By characterizing the cooperative as a system of attributes this article integrates the three positions taken in the debate. It emphasizes that a cooperative is an enterprise in itself with a specific group of stakeholders as owners. It is a governing body of its own. That is, the processing stage of production of a producer cooperative should be at the center of the analysis in our view, with a special role assigned to the unique aspects characterizing the members, i.e.

highlighting the transaction relationship as well as the investor relationship of the farmers with the cooperative.

In what follows, we confront the debate regarding the nature of the cooperative with the conceptual developments in the theory of the firm of the last 20 years. The next section briefly reviews the debate of 50 years ago. Two conceptual developments in the theory of the firm are formulated after that. Subsequently, these concepts are used to readdresses the debate. The last section concludes with formulating directions for further research regarding cooperatives.

The debate on the nature of an agricultural cooperative

Three positions of contention can be distinguished in the literature on the nature of an agricultural cooperative: the cooperative as extension of the farm (Trifon, 1961; Staatz, 1983; Menard, 2007), vertical integration between two parties (Sexton, 1986), or the cooperative as a firm (Robotka, 1947; Savage, 1954; Helmberger & Hoos; 1962). The core of the contention on this issue is the analytical emphasis, should it be on farms, on the processor, or on (the interaction) of both? Though some of the articles have actually aspects of various positions to a different extent, we classify them according to their main positions.

Referring to a cooperative both as “an extension of their entrepreneurial functioning” (p113) and as “*concerted* integration” (p102), Robotka (1947) did not intentionally make a clear distinction between the cooperative’s nature as “vertical integration” or “extension of the farm”. The non-profit feature of the cooperative provides support for the “extension of farm” perspective, while the collective ownership of upstream farmers over downstream assets characterized in the article can be seen as an argument for the position that the cooperative is viewed as vertical integration. What is more important is, however, his observation that “a new economic entity emerges when a cooperative association is formed, because participants must agree to submit to group decisions questions relating to the activity being coordinated.” (p113) This crucial last point leads us to classify this paper in support of the cooperative as a firm position.

Phillips (1953) was also equivocal on the distinction among the three positions. On the one hand, it mentioned both “concerted integration” (p85) and the analogy of a cooperative as a plant of a multi-plant firm (p75): “The participating firms are ordinarily

vertically integrated in the sense that the output of the joint plant is the raw product input of the individual plants of the participating firms – or alternatively, the output of the individual plants of the participating firms is the raw product input of the joint plant (p79).”; “Such participating firms are integrated in the sense that several stages in the production process are brought under one entrepreneurial control (p79).” On the other hand, the article stated that the cooperative is not a new firm (p75) based on the argument that a firm is not a firm unless it seeks profits for itself, which is an ex parte statement per se. Nevertheless, the arguments that “The cooperative . . . has no entrepreneurial unit; its member units each have their entrepreneur” and “the cooperative association consists of the sum of the multi-lateral agreements among the firms participating in the joint activity” (p76) emphasized that the focus of analysis has to be on the farm enterprises according to Phillips. This is the extension of the farm position.

Phillips’ focus on the farms was soon challenged by Savage (1954), a comment on Phillips’ work, which considered a cooperative as a firm capable of making entrepreneurial decisions just as any other private corporations. “Though farmers own their cooperatives and control them in the broad sense of the word, they do not make all or most of the entrepreneurial decisions.” (p531) “The delegation of decision rights is the common practice of cooperative. The individual farmers pool certain of their entrepreneurial functions and in doing so they authorized a collective body to perform these functions for them. In the process the farmers create an agency and defer to it some of their individual prerogatives.” (p532) Therefore the article concluded that the cooperative should be seen as a “going concern performing entrepreneurial functions delegated to them.” (p532)

Helmberger & Hoos (1962) denied Phillips' analogy between a cooperative and a vertically integrated firm based on the argument that "when agricultural producers jointly undertake the creation of a cooperative association, they seek goods and services provided at cost" (p280), rather than a high return on their investments like investors in the usual type of business enterprise. Furthermore, the paper held that the cooperative, in spite of its different intended objectives from an Investor owned firm (IOF), is a firm, a decision-making entity, given that the "theory of the firm can be adapted to reflect the cooperative's peculiar economic nature" (p281).

While acknowledging that the cooperatives resemble to a certain extent the characteristics of a vertical integration, namely, their "subjugation to external economic control" (p216) and the absence of a profit-seeking purpose, Trifon (1961) stressed that the plurality of interests of the members distinguishes the cooperatives from vertical integration, one with a single locus of profit maximization. It pointed out that the cooperative, as an aggregate of economic units, is "functioning only as a branch or part of the associated economic units" (p215-216), which is clearly the extension of the farm view.

Staatz (1983) highlighted also the members by addressing the issue of "group choice in a cooperative when members have at least partially divergent goals and engage in strategic behavior" (p1084). Cooperative decision making in the context of heterogeneous membership was conceptualized as n-person cooperative game. This is again the extension of the farm view.

Sexton (1986), however, considered a cooperative as vertical integration in the marketing chain in light of their functional similarities. In his focus on the income rights aspects of

cooperatives, he characterized a cooperative as “a horizontal club organized to accomplish vertical integration” (p215). The similarity with Staatz is that he adopted also the method of cooperative game theory.

The nature of a cooperative continues to receive attention nowadays. A recent article by Menard (2007) categorized the cooperative as a hybrid. According to this paper, what distinguishes a hybrid from an integrated firm is that “they maintain distinct and autonomous property and decision rights regarding most assets.” (p5) Yet “they simultaneously share some strategic resources, which requires a tight coordination going far beyond what the price system can provide and thus makes them different from a pure market arrangement.” (p5) Focusing all attention on the transactions and interactions between the cooperative firm and its members, the article could be viewed as supporting the position that the cooperative is an extension of the farm.

Conceptual developments regarding the nature of the firm

This section formulates two conceptual developments regarding the nature of the enterprise since the late 1980s. The first subsection addresses the enterprise as a system of attributes, while the delineation of a governance structure in terms of ownership rights, control rights and income rights is addressed in the second subsection.

System of attributes

The enterprise as a system of attributes is introduced by Milgrom and Roberts (1990). It proposed that an organization is composed of interdependent and interactive attributes and can therefore be perceived as a system. An organization consists of many attributes. An attribute represents a certain aspect of an organization, like an organizational department, an activity undertaken or a policy carried out by the organization. Examples of attributes are production technology, marketing, sourcing, logistics, communication, personnel, accounting, financing, authority and reward scheme. An attribute has multiple values such as “big” and “small”, “weak” and “strong,” or “rigid” and “flexible”. Figure 1 provides an illustration of a system with three attributes. It can represent, for instance, a dairy cooperative characterized by three attributes, x_1 as the production technology (geared towards “bulk” or “specialty” products), x_2 as sourcing (“make” or “buy”), and x_3 as financing (“retained earnings” or “certificates”).

[INSERT FIGURE 1 ABOUT HERE]

The attributes are related to each other and have therefore to be aligned. They form a system because the payoff associated with the level of one attribute depends on the level of all the other attributes. If the value of any attribute is changed, then the marginal return

to increase in any or all of the remaining activities changes. The complementarity among group of activities is thus at the center of this perspective. Exploiting these complementarities requires coordinated action between the separate attributes.

Governance

Governance concerns the organization of transactions, whereas a governance structure consists of a collection of rules structuring the transactions between the various stakeholders. A standard way of delineating a governance structure is to distinguish income and decision rights (Hansmann, 1996).¹ Income rights address the question “How are benefits and costs allocated?” Income rights specify the rights to receive the benefits, and obligations to pay the costs, that are associated with the use of an asset, thereby creating the incentive system faced by decision makers. They will be reflected in the composition of costs and payment schemes. Important themes regarding income rights are payment schemes, cost allocation schemes, the compensation package for the CEO and the other members of the board of directors, and the effects of horizontal as well as vertical competition.

The analysis of income rights / incentives is the realm of complete contracting theory in the form of agency relationships (Hendrikse, 2003). The working hypothesis is that everything that is known, can and will be incorporated in the design of optimal remuneration schemes / contracts without costs (Holmstrom, 1979 and 1982).

Decision rights in the form of authority and responsibility address the question “Who has authority or control (regarding the use of assets)?” The organizational chart describes

roughly the formal structure, and can be represented by decision rights. Decision rights concern all rights and rules regarding the deployment and use of assets. They specify who directs the firm's activities, i.e. the allocation of authority. Important themes regarding authority are its allocation ("make-or-buy" decision), formal versus real authority, relational contracts, access, decision control (ratification, monitoring), decision management (initiation, implementation), task design, conflict resolution, and enforcement mechanisms. A recent development is that decision rights are distinguished into ownership and control rights (Baker et al., 2006).

Decision rights matter because contracts are in general incomplete, due to the complexity of the transaction or the vagueness of language. The incompleteness of contracts is completed by allocating authority to somebody to decide in circumstances not covered by the contract. Incomplete contracting theory addresses decision rights / authority (Grossman and Hart, 1986 and Hart and Moore, 1990). The starting point is that the design of contracts is costly, which results in incomplete contracts. Incomplete contracts allocate decision power in situations left open by formal (incentive) contracts. The focus is on non-contractible actions. Authority has no meaning in a complete contracting setting because everything is covered in the contract.

Revisiting the debate

This section readdresses the debate about the nature of the cooperative by using the concepts of the previous section. The articles reviewed previously in this study can be easily disqualified when the focus is entirely on the formal models presented. They are neo-classical, production function models. These models are valuable in a market context in order to determine demand and supply relationships, while the models by Staatz (1983) and Sexton (1986) were geared towards cost allocation issues.ⁱⁱ The models in the papers reviewed earlier in this article, except for Menard (2007), are nowadays considered to be models about income rights.ⁱⁱⁱ It is hard to distinguish the three perspectives regarding cooperatives (vertical integration, extension of the member farms, enterprise) when only an income rights perspective is taken. The focus will therefore be on the ideas and insights expressed in these papers.

The strong point of the view that a cooperative is an extension of the farm is that it gears attention towards the portfolio of farm activities and assets. The investment decisions by farmers will be guided by bringing the farm to value and will therefore have an impact on the decisions of the cooperative. However, the downstream stage of production is neglected. This view does not survive the Savage critique / requirement that a cooperative is much more than a formalization of cooperation. Rather, it is a special governance structure regarding “a going concern”.

The vertical integration view is also not without problems. The main problem is that it considers solely the (attribute covering the) exchange between the upstream farms and the downstream processor. It may therefore neglect the impact of the multiplicity of the attributes of the upstream parties on the exchange relationship with the cooperative.

Member firms transfer only the decision rights regarding a subset of their attributes to the cooperative. Meanwhile they are autonomous economic units that maintain distinct property rights and their associated decision rights on other attributes. Robotka (1947, p105-106) recognized this important feature of cooperatives when he wrote “Members form a cooperative by reaching mutual agreements involving certain activities that participants had previously performed individually. On those jointly activities members of a cooperative have to function cooperatively by voluntarily choosing their individual values of the related attributes in accordance with others. Instead of making their entrepreneurial decisions on their own, the members of a cooperative pool together part of their decision rights and surrender part of their sovereignties to group decisions regarding to the joint activities.”

Moreover, vertical integration is characterized in the literature generally by the concepts such as common governance and leadership, joint planning, centralized decision making, and transfer of decisions to a distinct entity in charge of coordinating their actions. The extent to which a cooperative is vertically integrated depends on closeness between the allocation of ownership rights and the allocation of control rights (Menard, 2007). As a matter of fact, the intensity of members’ control over the activities of the cooperative is not as high as vertical integration would entail, because the decision rights are to a large extent delegated to the downstream processor whereas property rights are still in hands of members.

The separation of ownership and control in cooperative practice is in line with Hansmann’s observation (1988, p269) that “often the persons who have the formal right to control the firm - which typically takes the form of the right to elect the firm’s board of

directors - in fact exercise little effective authority by this mean over the firm's management." He argued (on p275) that, where ownership of the firm is shared among a large class of patrons, like in the cooperative, "highly participatory forms of decision making will not be efficient. Rather, in such situations, it is often more efficient, to assign only the formal right of control to persons who are not in a position to exercise that right very effectively." and "A firm of any substantial size and complexity needs a hierarchical form of organization for decision making, which means that the firm must have a single locus of executive power with substantial discretion and authority." This implies that letting members control and manage the cooperative is not efficient. In cooperative situations, control will generally be exercised by the firm's owners indirectly through voting for members of the board of directors, who then select their own presiding officers and hire a manager of CEO to manage the cooperative. Direct participation of members in decision making will be confined to approval of major structural changes, such as merger and dissolution. The hired management of the cooperative is in charge of the daily affairs most of the time (Hendrikse, 2005).

Notice that these ideas are also in line with Barton (1989) and Baker et al. (2006). Barton (1989) distinguished a cooperative from other businesses by three principles: user-owner principle, user-control principle, and user-benefits principle.^{iv} He viewed as fundamental to the governance of a cooperative that these rights are possessed simultaneously by the same party, i.e., the users (or patrons) of a cooperative. Members vote only on proposed policies regarding key issues (Barton, 1989). Baker et al. argued that firms can and do transfer control across fixed firm boundaries without changing asset ownership.

Our position is that the firm from a system of attributes perspective is able to integrate the

three views discussed in the above debate by considering the cooperative as a system of attributes. Looking upon a cooperative as a system, as proposed by the firm view, allows to represent the features of the plurality of interests of the extension of the farm view and the transaction relationship between the member and the cooperative of the vertical integration view. A graphic illustration of a cooperative consisting of two members and one processor is provided in figure 2. The essence of the agreement members enter into involves a commitment on the part of each of them to submit certain issues to group decisions (Robotka, 1947). Each of these member firms is an independent and autonomous organization in itself. A farmer is represented in figure 2 by a system of three attributes. For example, a dairy farmer may be characterized the attributes x_1 as his wheat production (“yes” or “no”), x_2 as his dairy transaction relationship with the dairy cooperative (“delivery requirement” or “no delivery requirement”), and x_3 as ownership of the dairy cooperative (“member” or “no member”). The boundary of the cooperative is visualized by the rectangle. Within it lie the processor with all its attributes and two attributes of both farmers, i.e. the transaction and ownership attributes.

[INSERT FIGURE 2 ABOUT HERE]

The separation of ownership rights and decision rights, formal and real authority, which is prominent in a cooperative actually also prevails in the conventional firm. The standard business corporation, which is normally owned by investors, persons who lend capital to the firm, is in a sense nothing more than a special type of producer cooperative- a lenders’ cooperative, or capital cooperative (Hansmann, 1988). The conventional IOFs assign their formal rights of control to their owners, capital providers, while the real authority is usually exerted by the hired management of the firm. The income rights allocation in

cooperatives and IOFs are also essentially the same. Benefits or losses of the cooperative are distributed to its users on the basis of their use (Barton, 1989). At regular intervals, profits or losses made in the cooperative are distributed pro rata among the members according to the amount of their patronages. Similarly, an IOF's net earnings and losses are distributed as well pro rata among the investors according to the amount they have lent. From the perspective of decision rights and income rights allocation, a cooperative is comparable to a conventional firm, which is always analyzed as an autonomous entity, rather than the extension of the investors or investing firms.

In order to highlight the difference between a cooperative and an investor owned firm, an investor owned dairy enterprise is presented in figure 3. The difference with figure 2 is that the investors have only one attribute involved with the dairy enterprise. The delivery of milk is not a relevant attribute in the portfolio of activities or assets of the investor, i.e. x_2 has to represent another aspect of the portfolio of activities or assets of the investor.

[INSERT FIGURE 3 ABOUT HERE]

Another way to clarify our position on the nature of a cooperative is to follow Bonus (1986) in comparing a franchise with a cooperative. The two dominating features of a franchise are its brand and business format. This determines the activities of the franchisees. The relationship between members and the cooperative is much looser than the relationship between franchisees and the franchise. A farmer is usually a member of various cooperatives due to the various crops grown at the farm, while a franchisee does not operate in multiple franchise systems.^v In figure 2 the core of the farm is therefore presented as a system of attributes outside the box demarcating the cooperative, i.e. a farm is a sovereign economic unit.^{vi} Applying the terminology of Williamson (1991), our

position can be characterized as a cooperative being a hierarchy.^{vii}

Summarizing, this article integrates the three positions in the debate by considering a cooperative as a system of attributes. The main feature is that a cooperative is a firm, conceptualized as a system. The system consists of attributes capturing on the one hand the processor as a system and on the other hand that many farmers collectively own the cooperative enterprise, i.e. the vertical integration aspect, and that usually multiple attributes of a farm enterprise are involved, i.e. the ownership of assets of the cooperative and the transaction relationship with it.

Conclusions and further research

We reviewed a debate about the nature of a cooperative originating more than 50 years ago. The literature is classified in terms of three views regarding a cooperative: a cooperative as an extension of the farm, as vertical integration, or as a firm. This article readdresses this debate by using modern concepts of the theory of the firm, like the firm as a system of attributes and the delineation of a governance structure in terms of ownership rights, control rights, and income rights. It is emphasized that a cooperative is to be viewed as a firm, where its owners as input suppliers have unique characteristics.

The core of an agricultural cooperative is member control over the infrastructure at the downstream stage of production. It provides members with market power and access to input/output markets. Furthermore, a cooperative has a member, rather than value added, orientation. It mainly serves member interests, rather than just Return On Investment at the downstream stage of production. Our view entails some preferences about future

research regarding cooperatives. Three of these preferences are formulated. First, future research may pay more explicit attention to the unique aspects of the members owning the **cooperative** compared to investors as owners of an investor owned firm. A cooperative is supposed to serve member interests and to generate maximum value in processing. Nearly always being user oriented (Barton, 1989), a cooperative is designed for the former task, and because the organizational structure required for the two tasks is different, it is expected to have an impact on the latter task.^{viii} An example of a unique aspect of members as owners of a cooperative having an impact on generating maximum value in processing is the single origin constraint, i.e. a cooperative will never abandon the inputs of its members. This may result in a different product portfolio of cooperatives compared to investor owned firms (Hendrikse and Smit, 2007).

Second, other attributes of the upstream farms may have an impact on the decisions of a cooperative. Member control will be reflected in the behavior of the cooperative because members take the entire portfolio of farm activities into account when they exercise their ownership rights regarding investment/divestment decisions. It implies that the decisions of a cooperative are guided by individual member's portfolio of farm activities, rather than the portfolio of activities of the cooperative. One illustration is that farmers are usually a member of various cooperatives. These cooperatives may be one-product cooperatives, or multiple-product cooperatives. For example, sugar cooperative Royal Cosun processes sugar beets, but also other vegetables. Some of their members have a transaction and investor relationship with Royal Cosun regarding the sugar beets, while they only have a transaction relation with Royal Cosun, i.e. themselves, regarding the other vegetables. The desirability of this arrangement is not clear (Dixit, 1997 and 2002).

Another illustration is a feature of cooperatives known as the portfolio problem. An important consideration of members in the diversification decision of a cooperative may be spreading of risks of their individual farm portfolio, which may result in members ‘... will pressure cooperative decision makers to rearrange the cooperative’s investment portfolio, even if the reduced risk portfolio means lower expected returns.’ (Cook, 1995, p1157). It implies that a cooperative diversifies most likely in a different way than an investor owned enterprise. More information about the relationship between the farm portfolio of members and the product portfolio of a cooperative seems therefore desirable. Census data may shed light on this relationship.

Third, collective ownership among many growers requires a method for collective decision-making. Most commonly a democratic decision-making procedure of some sort is employed. Votes in cooperatives and associations are usually weighted by volume of patronage, although some cooperatives adhere to a one-member-one-vote scheme. A problem with these collective decision-making procedures is that they may yield decisions that are (collectively) inefficient in the sense that they do not maximize aggregate grower surplus (Hart and Moore, 1996). It entails that decision power is to a certain extent allocated independently of quantity and / or quality. Collective ownership by many upstream growers of the downstream cooperative seems to require therefore that a model specifies at least two members and a downstream/upstream party.

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i McAfee (2002) uses the terms incentives and authority.

ii We like to express our appreciation for two models represented in the articles highlighted in our literature review. First, the way Trifon solves his model is nowadays characterized as Nash equilibrium. In 1961 he states already that ‘... “equilibrium” ... is marked by the fact that no individual would independently attempt further adjustments once the state has been reached.’ (p222) and solves his model according to this recipe. Second, the well known model by Sexton uses, like the seminal model of Hart and Moore (1990) in the incomplete contracting literature, cooperative game theory in order to address vertical integration. However, there are at least three differences. First, the model of Sexton does not specify a downstream party. Second, Sexton uses one cooperative game to analyse various governance structures, while Hart and Moore specify a different cooperative game for each governance structure. Finally, the focus of Sexton is on different revenue and cost allocation schemes, i.e. income rights, while Hart and Moore use cooperative game theory to determine the bargaining strength of each party in each governance structure in a consistent way, i.e. decision rights.

iii There are three main economic approaches towards modeling cooperatives (Hendrikse, 2003 and Menard, 2007): the production function approach, the complete contracting / principal-agent approach and the incomplete contracting / transaction costs economics approach. The first two approaches address income rights, while the third approach deals with issues regarding the allocation of ownership and control rights.

iv These principles seem to have been formulated independently from the incomplete contracting literature, while they are very similar to the distinction in terms of ownership rights, control rights, and income rights by Baker et al. (2006).

v One of the terms included in many franchise contracts is ‘passive ownership’ (Brickley, 1999). This contract provision restricts the franchisee from allocating effort to outside activities.

vi The same applies of course to the investors owning an investor owned firm.

vii Williamson distinguishes the governance structures market, hybrid and hierarchy. Bonus (1986, p335) summarizes his position as ‘The cooperative association is a hybrid organizational mode ...’, although he states later on the same page that ‘... a firm jointly owned by the holders of transaction-specific resources ...’. Hendrikse and Veerman (2001) classify a cooperative as a hierarchy.

viii We agree with Sexton (1984, p429) when he writes ‘Labor-managed firms are closely analogous to agricultural marketing cooperatives. Cooperatively processing and marketing the raw labor input is conceptually very similar to processing and marketing a raw agricultural commodity such as milk or grain.’ However, identifying important similarities may neglect important differences. Pencavel (2001) is an eloquent overview about the unique aspects of labor compared to other inputs.