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Agricultural cooperatives[1]

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ABSTRACT

The economic nature of agricultural cooperatives is explained by means of a logical continuation of the organizational economics rationale for family farms. The traditional explanations of the importance of family farms is discussed, and embedded in a broader framework which considers their transaction cost-economizing effect and their limitations in terms of limited ability to scale up production and to reach adequate market power. We maintain that these disadvantages represent the major motives for the creation of agricultural cooperatives, whose role lies in enabling the realization of advantages of large scale organization in agriculture while avoiding its transaction costs.

KEY-WORDS

AGRICULTURAL COOPERATIVES; IRREDUCIBLE TRANSACTION COSTS; REDUCIBLE TRANSACTION COSTS; NEW GENERATION COOPERATIVES; STRUCTURAL CHANGE; PROPERTY RIGHTS.

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1. Introduction

Cooperatives play a prominent role in the agricultural sector, both in developed and developing countries. Historically, cooperatives have been the main institutional and organizational tool through which independent farmers were able to withstand the market power held by local and transnational retailers. They also serve to shorten the supply chain by allowing producers to integrate most or all of the processing and marketing processes into one or few steps, thus allowing substantial savings on transaction and other intermediation costs. The agricultural sector accounts for 14.2% of total European Union manufacturing output, with 675 billion Euros worth of production. 38.5% of this output is generated by the cooperative sector (about €260 billion). In the EU there are about 40,000 cooperative enterprises employing over 600,000 persons; with 9 million members. The turnover is around €260 billion. These cooperatives represent over 50% of the shares of the supply of agricultural inputs and over 60% of shares of the collection, processing and marketing of agricultural products (Cooperatives Europe 2008; Cogeca 2010). In the US, in 2010 agri-food cooperatives had a market share of about 28 per cent in the processing and marketing of agricultural products, and a 26 per cent share in the supply of inputs. The USDA 2010 survey of marketing, supply, and service cooperatives identified 2,310 farmer, rancher, and fishery cooperatives in the US, with approximately 2.2 million members, 129,000 full-time and 54,000 part-time and seasonal employees. Net value of products marketed by cooperatives was $94 billion, and the total net income was $4.0 billion (USDA 2010).

These impressive figures notwithstanding, the modern situation of agricultural cooperatives in the Western hemisphere is paradoxical. While the importance of agricultural cooperatives in most industrialized countries is widely acknowledged, they keep facing substantial pressures and challenges of both internal and external nature. This paper seeks to explain this paradoxical evidence in terms of the tension between the economic nature of agricultural cooperatives and their institutional embeddedness into the contemporary Western agri-food systems. The paper traces the economic nature of agricultural cooperatives back to the sector-specific organizational characteristics of agricultural production. While these characteristics have so far been utilized to explain the superiority of family-based organization in agriculture (Schmitt 1993; Pollak 1985), this paper contends that they also provide a clue to rationalizing the reasons behind the emergence of transaction costs and imbalances in market power which create a functional niche for agricultural cooperatives. This will lead to an explanation of why cooperatives are dramatically important in agriculture, particularly in the institutional context of Western countries where family farming is a dominant form of agricultural organization. However, it is this institutional context that sheds light on why agricultural cooperatives face severe challenges. It will be shown that the institutional structure of the contemporary Western agri-food systems imposes new roles on agricultural cooperatives that expose them to continuing strain.

The economic nature of agricultural cooperatives is explained by means of a logical continuation of the organizational economics rationale for family farms. The importance of family farms has been traditionally explained in terms of the low feasibility of hierarchical organization of agricultural production due to supervision and monitoring difficulties and to the high value put by family farms on land ownership and independent production. What these explanations tend to under-emphasize is that the transaction cost-economizing effect of family farms has a price in the form of their limited ability to efficiently achieve large sizes. This limitation gives rise to two organizational disadvantages of family farms: they find it difficult to realize external economies of scale and to develop market power comparable to that

of their up- and downstream trading partners. These disadvantages represent the major motives for the creation of agricultural cooperatives, whose role lies in enabling the realization of advantages of hierarchical organization in agriculture while avoiding the need to incur its transaction costs, which are prohibitively high in this sector, and without forcing family farms out of independent production. This explanation of agricultural cooperatives is sector-specific since it does not apply to sectors other than agriculture. Other explanations, rather, point out the general abilities of cooperatives to economize on transaction costs and to develop 'countervailing power' in the presence of upstream monopoly and downstream monopsony in input and output markets.

After some initial highlights, the following sections will explore the sector-specific reasons for the importance of agricultural cooperatives by building upon the theory of the social division of labor. A recapitulation of this theory will serve as a foundation for rethinking the sectoral specificity of agricultural production. This argument will highlight several sector-specific limitations on the social division of labor in agricultural production and on this basis will develop an alternative explanation of agricultural cooperatives. The subsequent section will draw implications for understanding the institutional embeddedness of Western agricultural cooperatives. It will argue that the main manifestation of this embeddedness is in the competitive pressures which are experienced by cooperatives in the course of the structural change in the agri-food sector of the Western hemisphere. It is these pressures that lead to the formation of new cooperative models.

2. Agricultural cooperatives and the social division of labor

2.1. A recapitulation of the theory of the social division of labor

The theory of the social division of labor, dating back to Adam Smith, consists of two principal propositions. One is that the division of labor improves productivity due to the existence of gains from specialization; the other is that the division of labor is limited by a number of factors, such as the extent of the market (Smith 1981), transaction costs (Becker and Murphy 1992; Yang and Borland 1991), and availability of knowledge (Becker and Murphy 1992). We refer here both to the division of labor that takes place within organizations, and to the division of labor that passes through market exchanges. The division of labor that takes place inside organizations is mostly due to specialization and to the available technologies. By lowering production costs, it allows the widening of the dimension of the market. However, such division of labor is also favored by the reduction in the cost of ownership, typically in the form of monitoring costs and costs of collective decision-making (Hansmann 1996). On the other hand, the division of labor taking place by means of market exchanges is favored by the lowering of transaction costs. Contract incompleteness and asymmetric information are among the main causes favoring increased costs and the reduction of the scope of the social division of labor.

The theory of the division of labor locates the role of transaction costs in drawing the boundary between those human wants (preferences) that can be gratified by relying on the division of labor, and those that cannot. Crucially, this theory does not claim that the latter wants must remain ungratified; rather, it sees the mechanism of their gratification not in the division of labor and exchange, but in self-sufficiency which is understood as production for one's own consumption (e.g. Demsetz 1995, p. 7). This theory thus suggests that there exist two basic and complementary mechanisms of gratification of human wants, exchange and

self-sufficiency, whose range of application depends on the size of transaction costs. The higher this cost, the more wants must be gratified through self-sufficiency; the lower this cost, the greater space is available for relying on the division of labor and exchange. Gratification of wants through the division of labor and exchange is superior in the sense that it is supported by the existence of gains from specialization. Yet, when the generation of these gains is precluded by high transaction costs, individuals nevertheless seek to gratify their wants through self-sufficiency, despite the higher cost of doing so.

Hence, from the perspective of the theory of the division of labor, transaction costs give rise to two types of institutional responses. First, to the extent that transaction costs can be reduced, it causes the emergence of institutions facilitating market exchange, such as markets, hybrids, and the integrated organization (Williamson 1973).[1] Second, to the extent that transaction costs act as a constraint on the division of labor, it causes the emergence of institutions of self-sufficiency.[2] Importantly, the occurrence of positive transaction costs in its latter capacity does not mean that human wants remain ungratified; rather it means that these wants can be gratified through self-sufficiency and not through exchange, i.e. without realizing the gains from specialization.

A major fact about self-sufficiency is that it may be individual or collective (since not only individuals, but also groups can produce for purposes of own consumption). Individual self-sufficiency is embodied in individual autarky, while collective self-sufficiency is represented by a range of cooperative organizations producing goods and services for consumption by their members. Individual autarky, in the form of e.g. subsistence farming, is a common occurrence in many rural areas across the world, but it presents a relatively weak mechanism for supporting rural development, as compared to collective self-sufficiency. Importantly, in order to be designated as embodying self-sufficiency, cooperative organizations need not fully provide their members with the means of living. Rather, any instance of production of outputs for purposes of own consumption makes these organizations self-sufficient with respect to these particular outputs. Clearly, this understanding of self-sufficiency does not imply that these organizations are generally prohibited from buying and selling in the marketplace; rather, it simply requires these organizations to produce at least some outputs for purposes of own consumption by members.

The treatment of transaction costs in the theory of the social division of labor is markedly different from their treatment in the traditional new institutional economics literature. In the latter literature, agricultural cooperatives have traditionally been shown to economize on transaction costs by protecting their members, who often possess highly specific assets, from being exploited by opportunistic contractual partners (cf. Bonus 1986; Staatz 1987; Hansmann 1996). The proposed perspective of the theory of the social division of labor has shown, however, that transaction costs affect a market in two fundamental ways, only one of which has been reflected in the traditional transaction cost explanations of agricultural cooperatives and the new institutional economics literature more generally. First, in line with this literature, transaction costs act as a determinant of optimal institutional choice by helping to sort out those governance mechanisms

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[1] We recognize that the term hierarchy can be ambiguous since all hierarchies, in the tradition initiated by Coase (1937) and Williamson (1973, 1983) are organizations, but not all organizations are hierarchies. Williamson himself, in his 1973 article recognizes that not all organizations are hierarchies, though the focus of his analysis is mostly concentrated on hierarchical organizations. In our view, nonprofit organizations and cooperatives are defined as organizations, but do not need to be characterized by hierarchy. We introduce instead the dichotomy market/integrated organizations, where the organization is understood as a non-market mechanism of coordination of the economic activity that does not need to, though it surely can, be characterized by hierarchy.

[2] We defend the idea that those processes of production that are not included in the social division of labor, either because they cannot be managed within the organization, or because they are not transacted on the market, are comprehended by the category of self-sufficiency. Of course division of labor can be present in the family production process as well, but we do not consider this specific case in our analysis.

that economize on these costs most efficiently. All these governance mechanisms are located strictly within the social division of labor. Second, transaction costs act as a constraint on the social division of labor and thus circumscribe the boundaries of the market economy as a whole (cf. Valentinov 2009) and the process of integration of independent farmers into investor-owned firms. The second role of transaction costs has not been particularly stressed by new institutional economists (with the important exception of Demsetz 1995). The following subsection shows that it is the second role that has the primary explanatory relevance for agricultural cooperatives, and indeed, generates an explanation of why cooperatives have special reasons to be prominent in agriculture.

2.2. Specificity of agricultural production

The objective of this section is to highlight the ways in which the social division of agriculture is constrained and hence necessitates elements of self-sufficiency. The relevant constraints on the social division of labor are interrelated with the rationale for using family organization in agriculture. This rationale, in turn, is in the ability of family-based organization to reduce the cost of supervising hired labor, which is particularly acute in agriculture for the following reasons: 1) workers, for technological reasons, cannot be gathered together in a single location (Pollak 1985: 591) and therefore cannot be effectively monitored; 2) the outcomes of production are inherently uncertain due to unpredictable natural phenomena, and therefore are not unambiguously related to efforts expended by workers, which means that these workers cannot be held fully accountable for their work. Both of these reasons generate an asymmetric distribution of information between employer and employee, which can be opportunistically used by the latter, representing a typical principal-agent problem (see also Binswanger/Rosenzweig 1986: 519; Schmitt 1993a; Valentinov and Iliopoulos 2013).

In the words of Pollak, "the family farm can be regarded as an organizational solution to the difficulty of monitoring and supervising workers" (1985: 591), which also seems to be accepted by most other authors. On the other hand, an important consequence of the low feasibility of hierarchical organization in agriculture and the resulting optimality of family farms is the fact that the size of production units in agriculture is limited by the size of family. This limitation follows directly from the above mentioned difficulties in supervision and monitoring, since minimizing the use of hired labor on the farm implies constraining the farm size to that which can be effectively controlled by one family. Hence, the low feasibility of hierarchical organization in agriculture underlies the known tendency of family farms to preserve small sizes (see e.g. Johnson and Ruttan 1994).

2.3. The meaning of agricultural cooperatives

The low feasibility of hierarchical organization in agricultural production boils down, in essence, to the reduced scope for the social division of labor in agriculture. The social division of labor is predicated on the delegation of activities to specialized providers, and it is this delegation that is precluded by impossibility of adequate supervision of hired labor and by the necessity to preserve the self-sufficiency and independence of farmers. The constrained social division of labor manifests itself in two ways, each of which provides incentives to family farms to provision themselves with business services through cooperative organizations.

The first disadvantage of the small size of family farms lies in the inability to realize the external economies of scale discussed in the previous section. Although, in the opinion of Johnson and Ruttan (1994: 693),

these economies may emerge due to pecuniary economies or policy distortions, they nevertheless represent a real source of cutting production costs and improving access to markets. Yet, realization of these economies is limited by the size of the farm that can be effectively managed by one family, by the size that a family can reach, as well as by the necessity to coordinate parceled units represented by producer-owners.

The second disadvantage relates to the fact that firms occupying upstream and downstream positions with respect to farmers do not experience fragmentation of production and the monitoring and supervision difficulties characteristic of agriculture. These are, as a rule, hierarchically organized. Hierarchical organization, however, presupposes much weaker constraints on firm expansion than family-based organization. Consequently, up- and downstream firms have significantly larger sizes than individual family farms. Historically, this has resulted in the tendency of family farms to exhibit a much more competitive industry structure than the upstream and downstream firms in the agri-food sector, whereby farmers have been put at an increasing disadvantage in terms of their ability to bargain with up- and downstream trading partners on an equitable basis. Inter-farmer competition can exert extreme downward pressure on prices, which can force individual owners to sell their land. Moreover, the farmers' disadvantage resides not only in the danger of monopolistic pricing by up- and downstream firms, but also in their lower ability to combat opportunistic behavior on the part of these firms. As was indicated by Staatz (1987) and Hansmann (1996), farmers face significant risks of their trading partners exercising opportunistic expropriation of quasi-rents on their specific assets. The only alternative which is compatible with both retention of independent small ownership and with the achievement of adequate scale economies and market survival potential is the creation of collective governance forms represented by agricultural cooperatives.

As suggested by the theory of the social division of labor, the meaning of agricultural cooperatives is in enabling the self-provisioning of economic actors with goods and services whose delivery is precluded by the constraints on the social division of labor. As the above discussion has shown, the agriculture-specific constraints on the social division of labor result in the dominant role of family farming which suffers from the low ability to realize the advantages of large-scale business and low market power. The first disadvantage of family farms, their inability to capture external economies of scale, is overcome by machinery-pooling cooperatives, specialized service cooperatives, credit cooperatives, as well as a variety of rural cooperatives providing benefits to rural households. Such cooperatives represent an extension of individual family farms, which makes it possible to combine the advantages of family-based organization with the economies of large-scale production of required goods and services. The second disadvantage of family farms, their low market power compared to that of their up- and downstream trading partners, is overcome by marketing, purchasing, and bargaining cooperatives and associations. These cooperatives, too, manage to capture the economies of large-scale business organization while retaining the economic and legal independence of their members (which of course have to fulfill their obligations toward their cooperatives).

3. Institutional embeddedness: Structural change in the agri-food system

3.1. Trends in the Western agri-food system and the role of cooperatives

The previous discussion has suggested that the organizational economics rationale for agricultural cooperatives is closely interrelated with that for family farms. This implies that as long as family farms continue their existence as players in the agri-food sector, cooperatives are bound to preserve their basic role.

However, in order to realize that role, cooperatives may resort to a very diverse spectrum of organizational strategies. The choice of specific strategies is importantly determined by the ongoing processes of structural change that are dramatically transforming the organizational structure of the agri-food sectors of Western countries.

Basically, structural change in Western agri-food sectors involves increasing concentration in all of their major components, such as food retailing, food processing, handling and transportation, input supply, and agricultural production. For example, in the U.S. retail food market from 1991 to 2001, the four-firm share increased from 23.3 percent to 27.8 percent, while the eight-firm share increased from 35.2 percent to 43.6 percent (USDA 2002: 6). According to the information of the Committee on Agriculture, Nutrition, and Forestry of the United States Senate, in the U.S. in 2003 the four-firm ratio in the packing industry was 84 percent for steer and heifer slaughter and 64 percent for hog slaughter; in 2004, four companies controlled 89% of the breakfast cereals market; in 2002, the four-firm ratio for terminal elevators was 60 percent; in 2004, four large agrochemical/seed companies controlled more than 75% of the nation's seed corn sales and 60% of soybean seed sales (Harkin 2004). Trends of increasing concentration in agribusiness are characteristic also for Europe (Buccirossi et al. 2002).

Yet, even though the average size of family farms is rising, concerns are being increasingly voiced about the weakening of market power of family farms and the gradual elimination of competition in nonagricultural components of the agri-food sectors (Heffernan 1999; Harkin 2004). This suggests that concentration processes in agricultural production are being increasingly outpaced by those occurring in the rest of the agri-food sectors. The widening of this divergence is fully consistent with the existence of the above-discussed self-sufficiency tendency of family farms and constraints on their ability to reach large sizes. Even though technological progress allows for expansion of the volume of production activities that can be conducted by one family, the need to preserve family-based organization prevents the process of structural change from unfolding at a pace that can be accommodated by those industries that are based on hierarchical organization and are therefore free from any comparable size limitations.

The growing gap between sizes of family farms and their upstream and downstream trading partners dictates the expanding need for intersectoral coordination within the agri-food sectors and thereby enhances the potential role that can be played by cooperatives. Yet, coordination in the agri-food sector can be achieved by both cooperative and non-cooperative means. Sporleder (1992) lists the following institutional arrangements of coordination in the agri-food sector: market specification contracts, production management contracts, resource-providing contracts, forward pricing contracts, marketing orders, and agricultural cooperatives. The extent to which the former are likely to be used depends on their competitive advantage. Sykuta and Cook (2001) argue that the strength of cooperatives in effecting coordination resides in their tendency to involve lower information asymmetries and greater trust in their relationships with farmers than would be the case with investor-oriented firms. On the other hand, agricultural cooperatives are exposed to increasingly intense competition and growing capital requirements; to take full advantage of this strength, they need to adopt organizational strategies that allow them to be flexible and responsive to member needs while simultaneously ensuring access to the required capital. These strategies often lead to the emergence of new cooperative models that look increasingly dissimilar to the traditional cooperative models and increasingly similar to investor-oriented firms. New generation cooperatives are the most typical example of structural change involving cooperative coordination in agricultural. More generally, new cooperative models deserve attention because they may, though not necessarily, be incompatible with the basic structure of cooperatives' production, which rests with the preservation of self-sufficiency as embodied in membership rights. The issue of new cooperative models is the subject of the following subsection.

3.2. The emergence of new cooperative models

In the 1980s, agricultural cooperatives in the Western hemisphere entered a new era of an unusually difficult and hostile business environment, an era continuing to the present day. The major challenges faced by cooperatives since then include fierce competition with powerful food and agricultural input conglomerates as well as financing shortages caused by deteriorating capital markets. These challenges laid bare a number of internal constraints that have become known as the property rights problems (also known as incentive problems) of agricultural cooperatives (Cook 1995). Due to these problems, agricultural cooperative members felt discouraged to invest significant risk capital (Cook and Iliopoulos 2000) and were unable to make efficient collective decisions (Iliopoulos and Hendrikse 2009). These problems resulted in numerous cooperative conversions into investor-oriented firms and liquidations, as well as experimentation with new cooperative models (Cross et al. 2009; Chaddad and Cook 2004).

Chaddad and Cook (2004) organized these models into a continuum delimited by the traditional cooperative on one side and the investor-oriented firm on the other. The authors argue that cooperative models can be distinguished by how ownership rights are defined and assigned to the major stakeholders of the firm. Between the polar forms of the traditional agricultural cooperative and the investor-oriented firm, they identify five nontraditional cooperative models: proportional investment cooperatives, member-investor cooperatives, new generation cooperatives, cooperatives with capital-seeking entities, and investor-share cooperatives (ibid, p. 350).

Table 1. Property rights problems of agricultural cooperatives

Problem	Description
Free Rider Problem	A situation where current members or non-members use a resource for their individual benefit, and property rights are not well suited nor enforced in a way that ensures that current member-patrons or current non-member-patrons bear the full costs of their actions and/or receive the full benefits they generate. This situation is typical for open membership cooperatives.
Horizon Problem	A situation where a member's residual claim on the net income generated by an asset is shorter than the productive life of that asset (Porter and Scully, 1988). This problem is caused by restrictions on transferability of residual claimant rights and the restricted liquidity through a secondary market for the transfer of such rights. The horizon problem creates an investment environment in which there is a disincentive for members to contribute to growth opportunities. This problem is particularly severe with respect to investment in research and development, advertisement and other intangible assets.
Portfolio Problem	A situation where cooperative members, due to the lack of transferability, liquidity, and appreciation mechanisms for the exchange of residual claims, are not able to adjust their cooperative asset portfolio to match their personal risk preferences. In cooperatives, the investment decision is "tied" to the patronage decision and thus, from an investment point of view, members hold suboptimal portfolios. As a result, members attempt to encourage cooperative decision-makers to rearrange the cooperative's investment portfolio even if the reduced risk means lower expected returns.
Control Problem	A situation of divergence of interests between the membership and their representative board of directors (principal) and management (agent). Since the information provided and external pressures exerted by publicly traded equity instruments (stock market) is not present in cooperatives, and the members serving on the Board of Directors may have little or no experience in effectively exercising control, governance bodies operate with a handicap.
Influence Costs Problem	A situation where members attempt to influence collective decision-making to their own advantage. As shares in most cooperatives are neither transferable nor tradable, members that cannot exit the cooperative are left with only the voice option (Hirschman, 1970). Especially if the cooperative is engaged in a wide range of activities, influence activities complicate collective decision-making, and lead to wrong decisions or no decisions at all.

The main problems connected with the functioning of traditional cooperative property rights, which are characterized by open membership and non-transferability of claims on the patrimony of the organization are listed and described in Table 1. Traditional cooperatives are characterized either by non-transferable and redeemable capital shares owned by members (mostly in Anglo-Saxon countries), or by reinvestment of net residuals into locked assets (mainly in Southern European countries). These features of the traditional structure of cooperative property rights generate various incentive problems, which are listed and described in Table 1. Free riding derives from the fact that the utilization of common resources coupled with democratic membership rights engenders and incentivizes either the overuse of common assets, as in the tragedy of the commons problem (Hardin 1960; Ostrom 1990; Tortia 2011), or the reduction of work effort in an opportunistic way (Williamson 1973). The horizon problem is connected with the limited temporal horizon of permanence of the members in the cooperative in the presence of indivisibilities of assets (Furubotn and Pejovich 1970), while the portfolio problem is connected with the impossibility of differentiating investments in the presence of common or socialized assets. Finally, the control problem and the influence cost problem stem from the divergence of interests and preferences in a democratically managed organization, and in the connected costs of ownership (Hansmann 1996)

New cooperative models introduced various types of modifications to the basic scheme, which is usually deemed to induce investment and collective decision-making inefficiencies. Two main groups of modified sets of property rights are singled out (cf. Chaddad and Cook 2004). The first group includes proportional investment cooperatives, member-investor cooperatives and new generation cooperatives. In these cases ownership rights are restricted to member-patrons. The second group includes cooperatives with capital seeking entities and investor share cooperatives. In the first group, proportional investment cooperatives differ from the more traditional model only because members are required to acquire an amount of capital proportional to their patronage shares. Capital management policies are required to adapt internally generated capital to patronage shares. In member investor cooperatives net surpluses are distributed in proportion to capital shareholding and not to patronage (or a mix of the two can be devised). Distribution can take place either in terms of dividends or though appreciation of existing shares.

The two above mentioned solutions represent the most traditional modification of cooperative property rights and have been experimented in most countries over several decades. New generation cooperatives emerged in the United States during the 1970s and 1980s (Harris et al. 1996). They are considered to represent a new type of modification of cooperative property rights because they tie equity to delivery rights. New generation cooperatives are closed membership cooperatives in which, ordinarily, the number of members does not vary, but delivery rights are exchangeable. In addition, member-patrons are required to acquire delivery rights on the basis of expected patronage. Given these basic rules, a secondary market for delivery rights can be created where such rights can also be sold to new members, upon approval by the cooperative. The delivery of the product itself is regulated by complex marketing contracts that also include evaluations of product quality. New generation cooperatives introduce the possibility of appreciable and saleable shares. This way, the need for redeemability of members' shares and the ensuing variability of the firm capital is curtailed since members can sell their delivery rights on the secondary market. The property arrangements of new generation cooperatives induce a mechanism of incentive alignment whereby economic payoffs to the acquisition of the firm equity can be substantial. However, members' willingness to pay the upfront price of their delivery rights in terms of the firm equity presupposes that the market for delivery rights works smoothly enough, because otherwise incoming members can incur substantial losses given the non-redeemability of their equity shares. Finally, new cooperative models in the second group overcome the perfect identification of member-patrons with the owners of the organization. Outside ownership is allowed either in the form of partnerships or creation of controlled subsidiaries in the case of cooperatives

with capital seeking entities, or in the form of direct participation to the firm equity by external investors in the case of investor share cooperatives. This last type of solution creates more scope for the acquisition of equity capital on financial markets, but at the cost of diminished residual rights (USDA 2002, p. 25).

It must be mentioned that there exists no straightforward way of linking the specific property rights problems to a specific cooperative model in Chaddad and Cook's (2004) continuum. Each cooperative model encompasses various organizational innovations that are adopted to address more than one of the five property rights problems. These innovations pursue two goals: to provide cooperative members with strong incentives to supply their cooperative with risk capital and to facilitate collective decision-making at the same time. It is possible, however, to discern that the first three property rights problems justify the first goal while the remaining two explain the second one (cf. Table 1).

4. Concluding remarks and policy implications

The proposed sector-specific argument explains the critical importance of cooperatives in agriculture, even if it is their institutional embeddedness in the Western agri-food systems that underlies their challenges. Cooperatives have been shown to be units of self-provisioning located partially outside the system of the social division of labor. Yet, the institutional structure of the Western agri-food systems forces cooperatives to compete with, and thus to act as, functional equivalents of investor-owned firms. As a result, cooperatives are being exposed to pressures to adopt new governance models increasingly similar to those of investor-owned firms. Cooperatives have reacted to external and internal challenges by introducing new property rights models that strive, simultaneously, to increase the power of economic incentives, improve the ability to raise capital - first and foremost equity, and preserve the basic governance form of cooperatives, which identifies farmer-members with the controlling patron. The basic policy implication of this argument is that policy makers need to be aware of the tensions arising between the economic nature of agricultural cooperatives and their institutional embeddedness.

Policy instruments reflecting the economic nature of agricultural cooperatives include securing their limited immunity to antitrust regulations as well as granting tax exemptions, access to favorable terms of credit, and technical assistance. Immunity from antitrust regulation stems from the limited dimension of cooperatives, and from their tendency to eschew dimensional increases that are exclusively functional to increase market shares and market power. On the other hand, tax exemptions or tax advantages are justified in many countries, for example in Italy, by the not-for-profit nature of cooperatives and by the complete or partial socialization and indivisibility. The basic public policy challenge, however, is related to ensuring policy makers' awareness of the necessity for new nontraditional cooperative models, and for adjustments to legislative frameworks in accordance with these new models. As this paper has shown, the meaning of these models is not in attempting to break antitrust regulations, but in bringing the self-provisioning core of agricultural cooperatives in line with the requirements of the embedding institutional structure. For example, the closed membership policy of new generation cooperatives may represent not an attempt to increase profits by controlling supply, but rather a tool for operating the cooperative's processing plant at optimal capacity, thus overcoming some of the most serious challenges represented by free-riding, the horizon problem, and the portfolio problem.

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