
26. Interfirm cooperatives

*George Hendrikse and Li Feng**

An interfirm cooperative is an enterprise collectively owned by many other firms. The insights regarding its efficiency are organized based on the transaction and ownership relationship of the members with the cooperative enterprise. Evidence is grouped into aspects relating to the members, transactions, and the cooperative enterprise.

INTRODUCTION

Worldwide cooperatives are prominent in sectors such as agriculture and food, financial services, wholesale and retail. To illustrate, the European Union (United States of America, India, China) has 300 000 (29 000, 580 000, 525 000) cooperatives. About one-third of world food production passes through cooperatives (Patisson 2000). Cooperatives are also present in other industries, such as communications, consumer goods, day care and nurseries, handicrafts, housing, health care, memorial societies, rural electric systems, rural telephone systems and student housing (Hoyt 1989). Cooperatives are not only present in a variety of industries, but they are also very different from one another. For example, a bakery can be run by a consumer cooperative, a labor cooperative, a farmer cooperative, an investor cooperative, and perhaps others. Even fairly large manufacturing firms may be cooperative. For example, Spain's largest producer of refrigerators and other kitchen appliances is a cooperative. Worldwide, they provide 100 million jobs, 20 percent more than multinational enterprises. It is therefore not surprising that the United Nations (UN) has declared 2012 the International Year of Cooperatives.

An economic organization analysis of cooperatives has to identify its source(s) of competitive advantage compared to other organizational forms. An efficient organizational form maximizes total surplus by taking into account the costs and benefits of decisions for all stakeholders. Each stakeholder has various options, such as voice or exit (Hirschman 1970), available to express their preferences regarding decisions. Voice is often cumbersome and costly because collective decision making will elicit substantial influence efforts due to not all stakeholders being affected in the same way. Enterprises are therefore usually characterized by ownership of one stakeholder group (Hansmann 1996), such as investors, workers, suppliers, consumers, families, the government – or nobody. This raises the question of the optimal allocation of ownership. Ownership should be assigned to the group of stakeholders that can most effectively and responsibly make use of voice and that cannot be protected as cheaply by exit options (Holmström 1999). Particular relevance will be given here to comparative economic organization (Williamson 1991) as it entails that the benefits and costs of various organizational forms are compared, theoretically as well as empirically.

An interfirm cooperative (IFC) is defined as an enterprise collectively owned by

many other firms staying in a specified relation for a specific purpose. We focus in this chapter on the case of a cooperative governing the vertical transactions in a value chain, in particular a suppliers' owned IFC, in particular in the case of agribusiness. An IFC is therefore an enterprise collectively owned (vertical relationship) by an association of many independent upstream parties (horizontal relationship). A distinction is often made between a cooperative firm and a cooperative association. If an IFC is characterized as a cooperative firm, then the object of study is the enterprise at the downstream stage of production.¹ A cooperative association consists of many parties. It does not have a formal connection with a downstream party, and therefore does not have a formal vertical relationship with an adjacent production stage. The object of study is the association.² One of the functions of a cooperative association is to bargain or negotiate with parties in an adjacent stage of production for better terms of trade. The advantage of our definition of an IFC is that we can address issues at the downstream cooperative enterprise as well as issues at the upstream association of members.³

Owners of an IFC are usually referred to as members. The guiding principle regarding understanding an IFC is that a member advances the interests of their own firm portfolio in an IFC. Members of an IFC have two roles. On the one hand, a member is a patron (buyer, supplier, borrower, investor, etc.). It implies that the members of a suppliers' IFC have a transaction relationship with the enterprise by providing inputs. On the other hand, a member is an owner. Members are owners collectively possessing the residual rights over the IFC and take decisions regarding it. The difference between an IFC and an investor-owned firm (IOF) is therefore the transaction relationship. It entails that the IOF is owned by investors outside the chain of production, while the IFC is owned by parties in an adjacent stage of production. The essence of the IFC is that members commit only certain issues to group decisions (Robotka 1947). Meanwhile, members are independent in the sense that they do not necessarily collaborate with each other on other aspects of their individual firms.

The main challenge of an IFC is that it has to address two audiences. An IFC has to serve member interests and to generate maximum value in processing. It is designed for the former task and is expected to have an impact on the latter task. The next sections show that this feature makes an IFC the efficient organizational form in various circumstances.⁴ We show not only that various standard aspects of IFCs make it an efficient organizational form, but also that several other aspects of IFCs, which are often perceived as weaknesses, are actually strengths.

The research themes regarding IFCs are classified in Table 26.1 according to the three main aspects in the definition of an IFC: the member firm(s), the transaction relationship, and the joint ownership of an enterprise. The table is not exhaustive, but it reflects a large number of themes being prominent in the scientific literature regarding IFCs. This chapter addresses most of the themes in Table 26.1.

This chapter is organized as follows. It first formulates rationales for the existence and efficiency of IFCs originating at the transaction relationship, then highlights rationales due to the collective ownership of the enterprise by many independent suppliers. Evidence regarding IFCs is organized around members, transactions and the IFC enterprise. A final section concludes.

Table 26.1 *Classifying research themes*

Themes originating at		
Member firms	Transaction relationship	IFC enterprise
Portfolio problem	Double monopoly mark-up	Control problem
Horizon problem	Countervailing power	Influence problem
Single origin constraint	Asset specificity	Free-riding
Coordination (horizontal)	Market access / assurance	Tax benefits
Member satisfaction	Contracts	Formal/real authority
Social capital	Trust	Member involvement
Competition policy	Selection	Finance
Cooperative principles	Price volatility	Pooling
	Product quality	Inertia
	Coordination (vertical)	Diversification
	Complementarities	Board model
	Member commitment	Exit and voice
	Competition policy	Incorporation law
	Cooperative principles	Cooperative principles

TRANSACTION RATIONALES

Competition in markets has many beneficial effects, but markets are not without problems. Examples of the problems faced by small firms are the formation of prices in markets, price instability, the provision of high-quality inputs, lack of support services, exploitative grading practices and lack of access to markets (Dunn et al. 1979). Forming an IFC may solve these market failures (to a certain extent). We address the double monopoly mark-up, countervailing power, assurance of sale, competitive yardstick, coordination, information provision and providing member services.

Double Monopoly Mark-up

An advantage of vertical integration compared to a setting with independent upstream and downstream firms is that the double-marginalization problem is eliminated (Spengler 1950). An IFC is able to procure inputs from members 'at cost', because the economic functions of an IFC are ultimately the economic functions of the member-farms performed through the IFC. This results in improved allocative efficiency, and substantially higher profits for the IFC. It is one of the reasons why an IFC is expected to have a higher output level than an IOF. An additional advantage is that an IFC is taxed only once in a number of countries, while the net income of an investor-owned enterprise is taxed twice (once as corporate profits, once as dividend income).

Countervailing Power

It matters for the price level in a market whether a monopolistic seller is facing a fragmented demand side or many small sellers are facing a few large buyers (processors or

retailers). The latter situation is increasingly representative for many agricultural markets due to the massive consolidation of retailers (Reardon et al. 2004). This provides large buyers with many opportunities to play one seller off against the others to elicit price concessions. IFCs have been, and are, formed by many small sellers, to build countervailing power (Galbraith 1952) in order to avert the power of large processors as well as to exploit power on their own. Many small sellers joining forces in an IFC seems like the formation of a cartel, but many countries provide a partial antitrust exemption for IFCs in their competition laws. IFCs are often instrumental in starting new markets. For example, the market for life insurance did not start until mutuals began to offer these policies (Holmström 1999).

Assured Market Outlet

A farmer has often a weak bargaining position due to the perishability of the harvest. The fear of the farmer is that there will be hold-up in the *ex post* negotiation process because the investment costs have been made and cannot be recovered elsewhere; that is, investment costs are sunk. The farmer anticipates that the other party may take advantage of the specificity of his investments and decides not to invest in surplus generating activities. This is the (inefficient) hold-up problem (Klein et al. 1978). The desire to obtain a more certain demand has been an important driving force in the emergence of IFCs. For example, Nourse (1922: 581) observes about 'a small fruit-producing section' that 'the salvaging of their investment, or the continuance of their life work may be at stake on the part of growers. Hence it is argued (and demonstrated in practice) that the cooperative association of producers frequently achieves results where private outside entrepreneurship fails.' One of his arguments (p. 593) is that 'the agricultural producer can advantageously avail himself of the same cooperative form to open and maintain a channel from his farm to the factory or the wholesale or even the retail market'.

Competitive Yardstick

Many small firms may form an IFC to mitigate the adverse effects of a few powerful buyers. They enter at the next stage of production as a competitor and compete directly with these buyers. This is called the 'competitive yardstick strategy' (Nourse 1922), and it is implemented by forming an IFC. This may result in more competitive prices and quantities. When the market has become sufficiently competitive, the IFC may take a standby position but maintain the organizational capacity to re-enter the market, if necessary. The IFC thus recaptures economic losses – for example, the deadweight loss of monopoly – and becomes the source of differential member returns. Sexton and Sexton (1987) and Sexton (1990) justify favorable public policy towards (open-membership) IFCs based on this argument.

Coordination

In many production and supply chains, coordination is the primary concern, ensuring that value is created through joint actions throughout the entire chain. Coordination problems arise when there are (positive) externalities between different organizational

units. Shaffer (1987) argues that the characteristics of an IFC provide the potential for advantages in coordination for IFCs over IOFs since the coordination between the parties in an IFC internalizes the vertical externality. One advantage is that coordination generally increases price stability (Dunn et al. 1979). Another advantage is that coordination with suppliers may be more smooth in an IFC than in an IOF. Many crops require a dedicated processing plant, but inputs are provided only during a limited period of the year. Examples are sugar beet and peas. Horizontal coordination between many independent members reduces idle capacity at the cooperative enterprise by extending the period of the deliveries. Many IFCs use quantity (e.g. a delivery requirement) as a vertical coordination mechanism to obtain control over members' volumes. Feng and Hendrikse (2011b) identify the circumstances when this is efficient.⁵

Information Provision

IFCs provide many possibilities for horizontal as well as vertical information exchange. Many IFCs create a territorial-based forum for horizontal information exchange between the members (LeVay 1983). Shared information about safe pest control and other environmental concerns is an example (Peterson and Anderson 1996). This is often facilitated by the local nature of the membership. The vertical flow of information to the IFC can be superior for various reasons. Firstly, there are stronger incentives for voice in an IFC because 'exit' is a more expensive option for the IFC members than for the suppliers of an IOF (Cook 1994). Secondly, members as owners are more assured that the IFC would not use the information to act opportunistically towards them than an IOF (Staatz 1987a). An IFC usually has a list of members and collects a substantial amount of information about members' preferences, needs and production practices, and advice about products and services through periodic member surveys (Cook 1994). The result may be higher-quality, more frequent and more truthful information provision by the members to the IFC than they would to an IOF. For example, IOF American Crystal Sugar went bankrupt due to supplier protests of price differentiation, but as the firm became a cooperative there was trust among the membership (Balbach 1998). Another example is that the success of the Danish pig slaughterhouse cooperatives is due to the farmer-members being willing to let themselves be directed and controlled by the leadership (Søgaard 1994). Thirdly, members transact frequently with the IFC. This voices the preferences of the members well (Cook 1994). Finally, members of an IFC are significantly more independent to question management decisions and to reject its recommendations than the owners of an IOF (Hendrikse 1998; USDA 2002).

Providing Member Services

Members join the IFC primarily for economic reasons, such as prices and other business terms as well as transaction costs. They benefit also in terms of services, which affect the profitability of their individual farm enterprise. For example, when an individual farmer cannot afford to do consumer research related to the characteristics of farm commodities, it may be feasible for an IFC to do so. An investor-owned marketing agency has little incentive to provide this service because it cannot capture the benefits that accrue to farmers (Shaffer 1987). Other examples are field services, risk management services,

farm business consulting services, operating capital and facility capital financing, insurance programs and lobbying. Members also pursue non-economic objectives, such as deriving value from being a member of an association, a broader business education, leadership training, legislative influence, personal stature in the community and a greater sense of achievement (LeVay 1983; Barton 1989; Cropp and Ingalsbe 1989). An IFC may therefore take on auxiliary activities that an IOF would inefficiently forego. Feng and Hendrikse (2011a) model this feature in a multi-task principal-agent setting with three activities. An IFC elicits valuable downstream activities not reflected in the public listing of an IOF. The statistical evidence on diversification by IFCs seems consistent with this case (Caves and Petersen 1986).

GOVERNANCE STRUCTURE RATIONALES

A governance structure delineates ownership rights, decision rights and income rights regarding (physical or financial) assets (Baker et al. 2008; Hansmann 1996).⁶ Ownership rights specify the formal rights regarding the use of assets. These rights reside with the suppliers in an IFC. Decision rights address the question: 'Who has control (regarding the use of assets)?' They specify who directs the firm's activities; that is, the allocation of real authority. Finally, income rights address the question: 'How are benefits and costs allocated?' thereby creating the incentive system faced by decision makers.

Ownership Rights

Enterprises are not only part of the market, but are also an alternative to the market (Coase 1937). The crucial feature of an IFC is that the ownership rights of the enterprise are allocated to many firms in an adjacent stage of production. This is attractive for solving the hold-up problem at the adjacent stage of production. Hold-up explanations are relevant in various sectors, such as dairy, fruit and vegetables (Staatz, 1987b).⁷ Assigning more power upstream is efficient, and therefore the IFC is the most efficient governance structure only when the level of asset specificity required at the adjacent stage of production is relatively high compared to the level of asset specificity at the other stage of production (Grossman and Hart 1986; Hendrikse and Veerman 2001a; Hendrikse and Bijman 2002). This favors the incorporation of the IFC as a separate legal form.⁸

Shares of an IFC cannot be traded publicly without restrictions because the majority of the shares have to stay with the membership. Member dominance therefore poses restrictions on the tradability and transferability of IFC shares. This transferability problem is at the root of a number of specific issues in IFCs which will be addressed later, such as the horizon problem, the portfolio problem and the control problem. Another implication is that an IFC receives less favourable terms on outside equity than an IOF because the ownership rights regarding new investments face restrictions for the providers of funds. IFCs are therefore expected to be at least as leveraged as IOFs, given the level of asset specificity. Williamson (1988) shows that debt (equity) is efficient for investments with the level of asset specificity below (above) a certain level. It entails that IFCs may be efficient for intermediate levels of asset specificity (Hendrikse and Veerman 2001b).

Decision Rights

The distinguishing feature of an IFC is member dominance. This seems rigid in terms of tailoring the organization to a specific environment, but the many possibilities for structuring the bylaws, in terms of decision and income rights, often provide the flexibility to elicit efficient behavior. Several decision rights aspects will be addressed, such as delivery rights, collective choice rules, the organization of voice, the relationship between the owner and the management, and the incompleteness of laws.

Each member in an IFC is usually granted the right, and sometimes also the obligation, to deliver a specified quantity of the commodity each season. Nilsson (1998: 42) observes that: 'The delivery obligation for members is the dominating practice everywhere; in some countries it is even an obligation by law'. The right to patronage is crucial for members because it provides them with control over, and access to, the infrastructure at the downstream stage of production.⁹ It mitigates or even eliminates the hold-up problem at the upstream stage of production by allocating most of the bargaining power regarding the (quasi-) surplus to the members (Bonus 1986).¹⁰

Member firms pool some of their assets in an IFC – that is, collective ownership – while retaining complete autonomy with respect to all their other activities. Collective ownership requires a method for collective decision-making. However, Arrow's impossibility theorem indicates that this causes problems. Most commonly a collective decision-making procedure of some sort is used to come to a group choice. Zusman (1992) relates the efficient collective decision rule to characteristics of the issue to be addressed. A presidential system is efficient for operational issues, a simple majority system is efficient for policy issues, while an unanimity system is efficient for constitutional amendments. This result is driven by the change in the member's expected utility and the change in decision costs. Both variables increase with the number of members required to accept a proposal, but the ratio of the member's expected utility to decision costs increases faster when issues become more important.

The general rule is that all members have equal voting rights. Some countries prescribe the principle of one member, one vote by law, but there are also countries where this is not specified in the law and one member, multiple votes schemes have been adopted. A problem with collective decision-making procedures characterized by simple majority is that they may yield inefficient decisions due to voting power being allocated independently of quantity and/or quality. An IFC is more likely to be efficient when the membership becomes more homogeneous (Hart and Moore 1996).

One way to reduce the costs of collective decision making is to delegate decision rights to another party. Enterprises assign their formal rights of control to their owners, but the decision rights are generally exercised by them in an indirect way through voting for the board of directors, which then selects the management of the firm. Real authority is therefore delegated by the members to the management (Aghion and Tirole 1997; Baker et al. 1999; Hendrikse 2005). IFCs and IOFs differ regarding the importance of the formal owners in the decision process. The chief executive officer (CEO) in an IOF often has a large, if not dominant voice in selecting the board of directors (Bebchuk and Fried 2003), despite that the board of directors has the legal power. The CEO often has substantial control over setting, ratifying and implementing company policy. In an IFC, the CEO usually has significantly less influence over who sits on the board. Members

have a substantial number of seats in the board of directors and they are not dependent on the CEO for their position. They are sufficiently independent to question management decisions and to reject its recommendations. An IOF may therefore be conceived as consisting of one bureau, while an IFC consists of two bureaux with each bureau having veto power (Sah and Stiglitz 1986; Hendrikse 1998). This may account for some of the conservative decision making by IFCs. The veto power of each bureau in an IFC is efficient in environments with a relatively high percentage of poor projects or relatively high costs of adopting poor projects.

Having a law recognizing an IFC as a separate legal form facilitates the emergence of IFCs. However, there is less agreement about the specification of the bylaws. Laws between countries differ substantially regarding the freedom allowed to structure their bylaws. There is no law on cooperatives in Denmark, while the law is comparatively permissive in the Netherlands. The impression is that IFCs thrive when there is a law that on the one hand recognizes them as a distinct legal entity, and on the other hand is not very detailed regarding the bylaws. Another legal aspect is the essential role of organizational law (Hansmann and Kraakman 2000). Some enterprises, including IFCs, partition their assets into distinct pools of assets by creating separate legal entities in the enterprise to reduce the costs of business contracting, such as monitoring costs and isolating risks. Legal separation may also serve as a commitment that the members do not interfere too much with the daily activities of the management, and it may facilitate the distribution of rents over the various classes of members.

Income Rights

Ownership of the IFC is important for the members, but the actual payments are often more important for them. There are many degrees of freedom to structure the income rights in an IFC. LeVay (1983: 5) even states that 'IFCs may behave no differently from other types of enterprise'. It turns out that the income rights in informal, repeated relationships can be structured in such a way that exactly the same distribution of power results in an IFC as in other enterprises (Baker et al. 2002; Hendrikse 2007a). However, the actual composition of income rights often reflects that an IFC is collectively owned by many independent suppliers. Important issues regarding the structuring of income rights are geared towards the timely payment for deliveries, the quantity control problem, dealing with the tension between pooling and member heterogeneity, and the control problem.

Firstly, an important feature of an IFC is not only the assurance of sale for the members, but also the assurance of payment for deliveries. Ownership by the members guarantees that the time and method of payment for deliveries is tailored to the interests of the members, which reduces the bargaining problems regarding the terms of exchange experienced with other governance structures, such as independent processors or intermediaries.

Secondly, an IFC has several features in its design which makes it likely to produce more than an IOF. An IFC is expected to have lower marginal costs than an IOF due to the elimination of the double mark-up. Members receive for the inputs that they supply 'at cost' a market price plus a per-unit share of any rent obtained by the IFC. Another feature is that IFCs allocate revenues often proportional to deliveries. This payment

scheme has attractive properties, but it often sends the wrong signal to members about revenues (Sen 1966; Bogetoft and Olesen 2007).¹¹ Members will therefore often overproduce due to the IFC's average revenue exceeding its marginal revenue. Additionally, the output policy of an IFC is driven by the average rather than the marginal member (Helmberger and Hoos 1962; LeVay 1983). Finally, the practice of accepting all member deliveries by most IFCs, due to the production orientation of member firms, provides IFCs with a strategic advantage (Albæk and Schultz 1998). Individual members enjoy the benefits of their overproduction, while the loss in profits is shared with the entire membership. This lack of input control provides a commitment to overproduce in the competition with an IOF.

Thirdly, member firms are often faced with various production uncertainties. Pooling practices by the IFC perform a beneficial insurance function for risk-averse farmers. Pooling entails also that revenues and costs are to a certain extent allocated independent of quantity and/or quality. Members benefit from their membership in proportion to their volume of transactions with the IFC, not in relation to their capital investment. This may result in free-riding as well as adverse selection problems. Free-riding and underinvestment problems are to be expected when the transfer price paid to the member firms does not entirely reflect the benefits or the costs of deliveries by members. Adverse selection is due to the heterogeneity of the membership in terms of quantity and/or quality of the deliveries. Cross-subsidization of one group of members by another group of members may result in the latter group leaving the IFC (Hendrikse 2011). It may also mask market signals (Fulton and Hueth 2009). However, the flexibility of income rights allows for dealing with these problems by tailoring financial incentives to specific member characteristics (Staatz 1984; Sexton and Iskow 1988; Bontems and Fulton 2009). For example, Sexton and Iskow (1988) argue that membership fees have to be made roughly proportional to a member's expected patronage in order to prevent these problems.

Finally, the owners of enterprises are facing control problems due to the delegation of decision responsibilities to managers. The precise agency problem depends on the type of enterprise, due to differences in the available information. For example, an IFC lacks a source of information compared to an IOF, but it has also an additional source of information. An IFC does not have a public listing. This makes the provision of incentives and the monitoring of the managers different than in a publicly listed IOF. Feng and Hendrikse (2012) show in a multi-task principal-agent model that the interactions between the downstream and upstream activities may make the IFC the unique efficient governance structure. The absence of public listing, and the IFC CEO having to bring the downstream enterprise to value as well as to serve upstream member interests, prevents the CEO from choosing the level of the downstream activities too highly. The IFC internalizes externalities to a certain extent by putting a positive weight on serving member interests and generating maximum value in processing. IFCs are efficient in sectors where the marginal productivity at the downstream stage is below a certain level, which is determined by the upstream and downstream marginal product and the chain complementarities.

The IFC has an additional source of information compared to an IOF. It arises from the owners also being users of the IFC (Peterson and Anderson 1996). The frequent transactions with the IFC allow for smaller monitoring costs and fewer losses from improper

managerial decisions in IFCs than in other enterprises. The involvement of the member firms in the IFC limits the power of the top management. Peterson and Anderson (1996: 373–374) observe: ‘Cooperatives appear to have a significantly lower pay structure than non-cooperatives, especially at the upper management levels. Cooperative managers receive fewer emoluments and firm sponsored benefits, for example, limos, country club memberships, etc. Cooperatives also appear to operate with leaner staffs and lower costs structures than many non-cooperative firms’.

EVIDENCE

This section is focused on the behavior of IFCs. It is organized around members, transactions and the IFC enterprise.

Members

Stylized facts are presented regarding characteristics of the membership and some of the repercussions of the membership composition for the incentive to invest in the IFC.

Multiple memberships

Many farmers in the same area have similar product portfolios consisting of various products. These products could be handled by one IFC, but each product is often handled by a different IFC; that is, many IFCs are one product IFCs. One explanation is the costs of voice. Reducing the heterogeneity of the membership by constraining the activities of the enterprise to narrow business lines decreases the costs of voice (Hansmann 1996). This facilitates collective decision making. On average, US farmers hold memberships in 2–6 IFCs (Dunn et al. 1979).

Local

Most IFCs have a membership located in a specific geographic area. They are typically located near the member firms. Cropp and Ingalsbe (1989) identify several advantages of these local IFCs. Firstly, communicating with members is simpler because members are more likely to know one another and have close personal relationships. Secondly, members have similar marketing and production problems and thus less chance of disagreement. Thirdly, there may be greater member support and loyalty due to voting directly for the board of directors and on major business decisions. Finally, members may have more confidence in the local manager whom they know personally and meet regularly. However, an important disadvantage of local IFCs is their relatively small business volume. This limits their bargaining power and their ability to take advantage of economies of scale. The number of local agricultural IFCs is declining.

Portfolio problem

The portfolio problem of IFCs captures that the diversification decision of an IFC is influenced by the farm portfolio of members. Members often tie a substantial fraction of their farm portfolio to one IFC because they have usually a limited number of crops and each crop is handled by one IFC. Members will try to establish their desired farm port-

folio by influencing the diversification decisions of an IFC. However, the special features of IFCs, such as the lack of public listing and therefore the very limited transferability of ownership shares, prevent the members from diversifying their farm portfolio (in terms of risk and return) in an optimal way. Cook (1995: 1157) observes that members 'will pressure IFC decision makers to rearrange the IFC's investment portfolio, even if the reduced risk portfolio means lower expected returns'. Caves and Petersen (1986: 5) report that the statistical evidence seems to support the portfolio problem argument. Notice that this may be attractive. An IFC may take on auxiliary activities that an IOF may inefficiently forego.

Horizon problem

A prominent argument is that IFCs will underinvest is the horizon problem, which is due to the limited transferability of ownership rights. Old members have a disincentive to contribute to long-term investment strategies because the productive life of an asset is longer than their remaining membership period. They will therefore support investment opportunities with a shorter productive life of assets than the efficient one; that is, projects that will pay off quickly. This entails a tendency to underinvest in long-term strategies, such as brand promotion, market research and new product development. Jensen and Meckling (1979) label this the 'horizon problem'. Other underinvestment arguments are formulated based on the portfolio problem, collective ownership, patronage rights, patronized-based financing, pooling practices, expensive outside equity, lack of public listing, upstream ownership, and so on. However, the flexibility of the bylaws in terms of the allocation of income and decision rights allows for dealing with these issues efficiently. Olesen (2007) is an example. Caves and Petersen (1986: 4) review the evidence and conclude that 'the behavioral evidence on local cooperatives reveals few signs of underinvestment. If anything, it supports a contrary hypothesis that members gain utility from seeing their cooperative have a "first class" plant, more capital-intensive and durable than optimal investment criteria might suggest'. Fahlbeck (2007) reports also no support for a horizon problem in agricultural cooperatives.

Transaction

This section highlights stylized facts relating to the inputs and outputs of the IFC being supplied by its owners. We address the market share of IFCs, the quality of products supplied, and contracts.

Market share of IFCs

Most agricultural markets show coexistence of IFCs and IOFs. For example, 26 percent of all major farm purchases were purchased through IFCs in the USA in 1989, while farmers marketed 28 percent of their products through IFCs (Cropp and Ingalsbe 1989). Most agricultural sectors in the European Union also exhibit the coexistence of IFCs and IOFs (Hendrikse 1998). Explanations have been formulated, such as supply assurance (Carlton 1979a, 1979b), competitive yardstick (Sexton 1990), differential screening (Hendrikse 1998) and contractual externalities (Hendrikse 2007b).

The incidence of IFCs varies between countries and over time. Hansmann (1999: 387) observes that: 'More generally and more strikingly, the overall share of economic activity

accounted for by IFCs is larger in advanced economies than it is in less-developed economies. And, more striking still, the market share of IFCs in economic activity has grown throughout the 20th century'. For example, Sexton (1986: 1170) reports that IFCs' farmgate market share has been rising from 20 percent of marketing sales in the 1940s to about 30 percent in the 1980s and from 12 percent to 27 percent of farm input sales over the same period. Feng and Hendrikse (2011a) explain these developments by the rise of ICT, and its applications in the management of chain complementarities in supply chains.

Another observation is that the IFC share of business activity at the farm level is considerably larger than at subsequent levels of the food system. For example, Dunn et al. (1979: 243) report that local IFCs handle 40 percent of the grain moving off the farm, but only 21 percent of the initial volume moves to the next step in the IFC marketing system by the regional IFCs. By the time the grain leaves the export elevators, the IFC share is down to about 5 percent of the initial off-farm volume. There are a number of explanations for the limited ownership of activities much beyond the member firms, such as the member orientation on direct interests and experience (Caves and Petersen 1989), reduced information advantages of working closely with member firms (Ling 2010), reduced investment incentives (Hendrikse and Bijman 2002), and the increasing capital requirements of industrialized agriculture (Fulton and Hueth 2009).

Finally, there are considerable market share differences between sectors. Five commodities account for 90 percent of the marketing volume handled by IFCs (Cropp and Ingalsbe 1989). Two-thirds of the volume is accounted for by grain and dairy products. The other three commodities are fruits, vegetables and nuts as a group; livestock; and cotton. Membership percentages differ between sectors. For example, 87 percent of the farmers are in IFCs in the dairy sector, while livestock producers were least involved, with 48 percent in 1989. Dairy cooperatives have major shares in making hard products, 71 percent of butter; 96 percent of non-fat and skim milk powder, 26 percent of cheese, and 42 percent dry whey products, while their shares are less significant in sectors that are capital-, technology- and service-intensive and that carry high product and market risks: 7 percent of fluid milk, 4 percent of ice cream, 11 percent of yoghurt, and 14 percent of sour cream (Ling 2010). The same pattern is observed in IFCs' share of marketing activity. The IFC's share of total marketing activity is 78 percent in dairy, while it is 8 percent in livestock. Europe shows also substantial variation (Hendrikse 1998). The dairy, grain, and fruit sectors usually have the largest market share for IFCs. Caves and Petersen (1986) provide support for a number of explanations, such as local concentration and specialization, countervailing power and short-term hold-ups, and capital-intensive activities which are organizationally not complex.

Product quality

Some of the traditional IFC business practices may cause problems regarding product quality of upstream deliveries by member firms as well as the output of the IFC enterprise. The composition of upstream deliveries may be vulnerable to adverse selection for various reasons. Firstly, an IFC is traditionally a 'home' for member production: that is, all member deliveries are accepted. The price in a niche market may be undermined by the practice of accepting all deliveries by members. Secondly, the pooling practices of IFCs often fail to sufficiently reward the members delivering the highest-quality prod-

ucts.¹² Thirdly, many IFCs have an open membership policy: that is, a new member is accepted when the entry requirements are satisfied. Finally, the horizon problem entails that there are reduced incentives to invest in long-run activities to enhance quality. Cook (1995) observes that IFCs tend to operate in first-stage food manufacturing industries and that these industries are low-value-added industries. This is in line with Sexton and Iskow (1993) and Royer (1999), where the latter states that 'cooperatives . . . tend to operate in the low value-added fluid milk segment of the industry'.¹³ However, an IFC may also facilitate product quality due to various possibilities for superior horizontal as well as vertical information exchange.

Contracts

MacDonald and Korb (2011) distinguish three methods for transferring commodities from farms to the next stage of production: spot markets, vertical integration (including IFCs) and contracts. A farmer often has a portfolio of exchange mechanisms due to different transactions having different risks, such as biological risks, price risk, institutional risk and behavioral uncertainty.¹⁴ Exchange mechanisms differ between agricultural products. For example, contracts are extensively used in poultry, hog, sugar beet and tobacco production, but are much less prevalent in corn, soybeans and wheat. Bogetoft and Olesen (2002, 2004) observe that the presence of coordination clauses in contracts depends on the perishability of the crop. Peas, fruit and broilers are coordinated through instructions, while storable products such as potatoes, sugar beet, and grass and clover seed are not coordinated in contracts.

Contracts are embedded in a governance structure, and the details may therefore differ between a market setting and an IFC. Balbach (1998) observes regarding the beet sugar industry in the USA that only IFC processors use contracts with clauses based on the extractable sugar content of the beets. He provides a measurement cost explanation. Non-IFC processors have an incentive to under-report quality, and the costs of monitoring a processor's quality measurements are too high for farmers. These contracts are attractive for the IFC processor because they give member firms an incentive to produce higher-quality beets and their processor has been able to reduce processing costs. Similarly, Bogetoft and Olesen (2002) observe regarding the contracts for the production of grass and clover seed that the authority to order reploughing is allocated to the processor in the IFC, whereas this right is not allocated to the private processors.

IFC Enterprise

This section addresses some stylized facts at the level of the IFC enterprise: pooling, conservative investments, production orientation, diversification, single-origin constraint, governance structure changes, inertia and Gibrat's law.

Pooling

Most IFCs use a pooling arrangement in which members share equitably on a per-unit basis in the revenue stream that has been created. Nilsson (1998: 43) observes that: 'The principle of equal treatment within agricultural IFCs is traditionally strong. This involves things as pricing, for example prices are not always differentiated based on quality and quantity, and member control, for example the general rule is that all members have equal

voting rights'. Fruit and vegetable IFC The Greenery has experienced adverse selection processes with high-quality members leaving the IFC and forming grower associations due to pooling practices, but they came back after adjustments in the bylaws to provide sufficient compensation for members with high-quality deliveries (Hendrikse 2011).

Conservative investments

Members of an IFC often favor a conservative investment strategy in order to stabilize member returns (Staatz 1987a). Peterson and Anderson (1996) claim that the conservative investment strategy entails that only the most secure projects are considered as investment options. They report, based on a CEO survey, that 'CEOs were nearly unanimous (95 percent of those interviewed) in citing very conservative investment strategies within their cooperatives' (1996: 380). Feng and Hendrikse (2011c) formulate an explanation based on the upstream focus of agricultural cooperatives.

Production orientation

Nilsson (2001) observes that IFCs in most agricultural markets do have large production volumes and large market shares in the collection and primary processing of the raw produce. Bogetoft and Olesen (2007: 37) observe that problems of overproduction typically occur in cooperatives selling in 'thin markets'.

Diversification

Various ideas have been formulated which may be relevant for the diversification choices of IFCs, such as the portfolio problem, the horizon problem, conservative decision making, and the single-origin constraint. The approach in empirical research is usually to investigate the portfolio differences between IOFs and IFCs. Diversification choices of an IOF aim to maximize the net returns of the investors, while the diversification choices of an IFC are guided by bringing to value the portfolio of members. Hendrikse and Van Oijen (2004) establish that publicly listed enterprises diversify more in unrelated activities (two-digit industries) as well as related activities (four-digit industries).

Single-origin constraint

The diversification activities of an IFC are geared towards bringing the portfolio of the members to value because members may suffer substantial capital losses if their farming activities are not adequately supported. IFCs continue their efforts on behalf of their member-producers even during extended periods when economic and financial conditions would call for exit by other enterprises (Dunn et al. 1979). An IFC provides a 'home' for the output of members. The possibilities for diversification by IFCs are therefore constrained, especially when activities are involved far removed from the direct interests and experience of the IFC members. Cook (1997: 87) labels the member focus in the diversification activities of IFCs as the single-origin constraint. An illustration is the sugar industry in the Netherlands. It consisted of two enterprises: the publicly listed CSM (Centrale Suiker Maatschappij) and the IFC SuikerUnie, nowadays called Royal Cosun. CSM started to diversify into bakery ingredients, with sugar as an important ingredient. It nowadays has a leading position in the world market for bakery products, and has divested its sugar activities. Cosun maintains its sugar activities, and has diversified into potatoes and a few vegetables.¹⁵

Governance structure changes

The characterization of a governance structure in terms of ownership, decision and income rights allows for various governance structure responses to new circumstances. Firstly, a different allocation of ownership rights may be needed in order to deal effectively and efficiently with the increasing heterogeneity between members and/or increasing price competition and increasing concentration at the retail level. Examples of changing ownership rights are mergers between IFCs, the emergence of grower associations, and forward integration (Hendrikse 2011). Another response is demutualization by switching to the governance-structure IOF (Royer 1999; Fulton and Hueth 2009). The typology of Chaddad and Cook (2004) illustrates that there is substantial variety in the allocation of decision and income rights between IFCs.

Secondly, IFCs may respond to changing market conditions by changing the allocation of decision power between the various bodies inside the IFC, such as the general assembly, the board of directors, the supervisory committee and the management. Bijman et al. (forthcoming) present substantial board structure variety. Three IFC board models are demarcated: the traditional model, the management model and the corporation model. The general assembly appoints the board of directors as well as the supervisory committee in the traditional model, where the supervisory committee supervises the board of directors. The board of directors appoints the management. The management model is the same as the traditional model except for the management of the firm and the board of directors being merged into one body. The main characteristic of the corporation model is that the board of directors and the supervisory committee are one body. The firm has been legally separated from the society of members. The latter two models move decision power closer to the final product markets. They reflect four tendencies in IFCs: (1) a shift of decision rights from the board of directors to management, and therefore changes in the role of the supervisory committee; (2) a tendency of professionalization of the board of directors and supervisory committee, and therefore changes in the composition of these bodies; (3) a legal separation between the society of members and the IFC enterprise; (4) IFCs partition their assets by creating legal entities within the IFC.

Thirdly, the bylaws allow also for substantial variety in terms of the income rights. Differentiation and innovation in agricultural and horticultural markets has the tendency to increase member heterogeneity. This poses a challenge for a traditional IFC because various aspects are tailored towards homogeneous members (Hansmann 1996). Collective decision-making procedures and pooling arrangements are less likely to be efficient in a situation with a heterogeneous membership. Highly innovative growers demand a different treatment than the less innovative growers. IFCs have responded in terms of changing their income rights by specifying less uniform transaction requirements, cash payments and capital titles. A number of examples illustrate this development. Many IFCs have responded to changing market conditions by changing member incentive schemes. Different classes of members emerge based on meeting certain transaction requirements, such as transaction volume, delivery time, and quality. Financial innovations in IFCs are introduced, such as the introduction of transferable equity shares, appreciable equity shares, minimum upfront equity investments and payments partially based on investments levels. Related to this is the introduction of tradable delivery rights. IFCs with strong incentive structures are characterized by 'individualized'

rather than collective capital structures. The introduction of individual member shares and proportional voting are examples. The 'new generation' IFC model (Cook 1995) is an illustration of IFCs allowing for more differentiation in the treatment of the members.

Finally, Krogt et al. (2007) study the effect of governance structure on the direction of interfirm consolidation and collaboration strategies. They argue that specific IFC attributes, such as democratic decision making and limited access to equity capital, imply that IFCs prefer strategies which involve relatively low risks and limited amounts of capital. Their data show that IFCs prefer mergers, collaboration agreements, joint ventures and licensing, while IOFs have a tendency to choose acquisitions and strategic shareholdings.

Inertia

I have argued above that there are many aspects of an IFC which may make it an efficient organizational form. However, these possibilities are often not exploited. For example, the provision of information in IFCs may be better than in an IOF. But information systems are needed to collect, process and use this information. Peterson and Anderson (1996) observe that these are often missing in IFCs. Another example is the flexibility allowed by the law to structure the bylaws. Again, these possibilities are often not used. Mérel et al. (2009: 206) observe that: 'Although cooperatives are free to specify their criteria for membership in bylaws, such criteria are usually general, encompassing, and outdated'. It results in frequent descriptions of the free-rider problem, horizon problem, portfolio problem, control problem and influence cost problem in IFCs (Vitaliano 1983; Staatz 1987a; Cook 1995). Fulton and Hueth (2009) indicate that these problems are due on the one hand to poor management such as in IOFs, and on the other hand are due to specific features of IFCs such as lack of capital, property rights problems and portfolio problems.

Gibrat's law

IFCs differ in scale and scope. Some IFCs consist of five or six members, while others consist of more than 10 000 members. Some perform only one or two marketing functions, while others store, grade, process, package, brand, distribute and merchandise products. Many IFCs handle only one product. Some of them limit themselves to plain processing of the input, while others have developed a large product portfolio based on the input by the members. Dunn et al. (1979: 244) state that in many commodity markets: 'In value of products sold, the largest four cooperatives are considerably smaller than their noncooperative counterparts'. So, IFCs and IOFs seem to differ in terms of Gibrat's law: that is, the size distribution of enterprises (Simon and Bonini 1958).

CONCLUSION

Member firms are owners and users of an IFC. This feature is the driving force behind the efficiency and strategic explanations for the worldwide existence and persistence of IFCs. IFCs are usually founded to provide critical and valuable services to the member firms. Several aspects of an IFC make it an attractive organizational form, such as procuring inputs 'at cost' due to eliminating the double monopoly mark-up, establishing a

fair price by organizing countervailing power, reducing hold-up by creating an assured market outlet, promoting competitive prices and quantities by creating a competitive yardstick to mitigate the effects of a few powerful buyers, facilitating (horizontal and vertical) coordination, improving information provision and providing member services.

Several other aspects of IFCs, which are often perceived as weaknesses, can also be strengths, such as the overproduction tendency, (partial) pooling, conservative decision making and the lack of public listing. The overproduction tendency endows the IFC with a strategic advantage in the competition with rivals by making it more aggressive. (Partial) pooling insures risk-averse farmers and counteracts the tendency of competitive enterprises to overproduce high-quality products. Conservative decision making is attractive when the incidence of poor investment projects is relatively large. Finally, the lack of public listing elicits valuable activities not reflected in the public listing.

These reasons imply that IFCs are to be expected in a number of sectors. IFCs prevent hold-up by downstream enterprises regarding upstream outputs. They are therefore expected when the asset specificity of member firms is relatively important compared to that of the cooperative enterprise. IFCs are also expected in environments with a relatively high percentage of poor projects or relatively high costs of adopting poor projects. Stringent screening reduces the likelihood of adopting poor projects. Value chains where the marginal productivity of member firms is relatively high compared to that of the cooperative enterprise is attractive for an IFC because it prevents the CEO from choosing the level of the downstream activities too high.

Studying IFCs is not only important for understanding and improving these enterprises, but it serves also as a counterfactual for the much-studied investor-owned firm, and to enhance our understanding of the institutional structure of production. Further research is desirable due on the one hand to conceptual developments, and on the other hand to the evolution of markets in terms of communication technologies, genetics, robotics, laws, and so on. This will enhance our understanding regarding the circumstances when an IFC is a desirable governance structure.

NOTES

- * Comments by Anna Grandori, Constantine Iliopoulos and Jerker Nilsson are much appreciated.
1. A prominent example of a definition taking this perspective is Dunn (1988: 85). He defines an IFC as 'a user-owned and controlled business from which benefits are derived and distributed on the basis of use'.
 2. A prominent example of a definition taking this perspective is provided by the International Cooperative Alliance (2007). It defines a cooperative as 'an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically controlled enterprise'.
 3. The nature of an IFC has been debated frequently. An important contribution is Emelianoff (1942), triggering the debate in the 1950s and 1960s. Three views are distinguished in the debate (Feng and Hendrikse 2008). The 'extension of the firm' view maintains that the IFC is just an association of firms, not a new firm per se; it has no entrepreneurial unit (Phillips 1953; Trifon 1961). The 'vertical integration' view advocates that member firms are integrated with the downstream production stage. It entails that several stages in the production process are brought under unified control (Phillips 1953). The 'firm view' suggests that an IFC is itself a business enterprise and an economic entity; a new decision-making body is created by the formation of an IFC (Helmberger and Hoos 1962; Robotka 1947). An IFC is viewed as a special type of firm capable of making entrepreneurial decisions just as any private corporation (Savage 1954).

4. The focus on the efficiency of the IFC is in line with the conclusion of the review by Lafontaine and Slade (2007: 680) regarding the findings of empirical studies that 'under most circumstances, profit-maximizing vertical-integration decisions are efficient, not just from the firms' but also from the consumers' point of view'.
The efficiency of an IFC is usually determined by comparing it with the IOF, where the IOF is active in the downstream stage of production, such as the cooperative enterprise. Other governance structures than the IOF could serve as a benchmark, and are informative regarding an IFC. For example, we agree with Sexton (1984: 429) that '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 labour compared to other inputs.
5. Various agricultural markets are governed by marketing orders (Babb and Bohall 1979). They regulate legally the terms of exchange for commodities.
6. These three rights are already distinguished in the agricultural economics literature. Dunn (1988) characterizes an IFC by 'user-owner, user-control, and user-benefits'. The labels 'formal/legal' authority, 'real' authority and 'incentives' are also being used.
7. Other aspects of transactions than asset specificity, such as complexity or uncertainty, may have more explanatory power in other sectors. For example, the complexity of the logistics process in the flower industry seems to be a more prominent concern than asset specificity in the organization of the economic activities regarding flowers.
8. The quadrupling of the number of IFCs in China since 2007 illustrates the importance of incorporation.
9. Carlton (1979a, 1979b) has investigated the value of outlet assurance in an uncertain market environment.
10. Hendrikse (2011) shows that countervailing power and the hold-up problem are intertwined and identifies the circumstances when countervailing power is required to provide the efficient incentives to invest in specific assets by farmers.
11. Zusman (1982) shows that this can be remedied by an appropriate choice of cost distribution rule, and that it is attainable through majority voting.
12. Saitone and Sexton (2009) show that partial pooling may be optimal because it insures risk-averse farmers and counteracts the tendency of competitive enterprises to overproduce high-quality products in order to maximize industry profit.
13. Feng and Hendrikse (2011a) show that IFCs are uniquely efficient in such settings.
14. Hendrikse (2007b) investigates the relationship between spot and contract markets. Suppliers contract with the high-reservation-price buyers when the contract is characterized by a delivery requirement and a contracting benefit. These relationships procure the high probability demand, while the spot market serves to supply inputs when the upstream party is not able to produce.
15. Hendrikse and Smit (2007) analyze the implications of an IFC never abandoning the activities of its members for product portfolio evolution in an agent-based simulation model. The product portfolio of the IFC evolves in one cluster around the single-origin constraint, while the product portfolio of the IOF disperses and disintegrates into a random pattern of diverging small clusters.

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