# Organisational Efficiency in the Fresh Produce Chain: The Role of the Marketing Co-operative

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## ABSTRACT

A co-operative is a special type of ownership structure, with a strong collective character. In allocating income rights, the co-operative applies the principle of equal treatment. With regard to decision rights, democratic decision-making and consensus building is practised. Both the allocation of residual income rights and the allocation of residual control rights affect the investment incentives of the members of the co-operative. In this paper we study the effect of ownership rights on the incentive to invest of Dutch fruit and vegetable growers. We explain why traditional auction co-operatives have been transformed into marketing co-operatives, and why growers have left the large heterogeneous marketing co-operatives to establish small, homogeneous growers' associations.

Keywords: Co-operative, Fresh produce, Ownership, Incentives

## INTRODUCTION

Production and marketing of fresh produce (fruits and vegetables) in Europe is characterised by increasing differentiation. Consumers demand more variety, more convenience and higher quality (including food safety guarantees). The retail industry has become more concentrated, retail companies have internationalised, and the fresh produce section in the store has become more important (for profit generation and for store image). Producers have responded to consumer and retail demands and to increased competition by developing and producing a greater variety of products, higher quality products, and more convenience products.

In the 1990s, major restructuring took place among Dutch fresh produce co-operatives (Bijman, forthcoming). Mergers reduced the number of auction co-operatives from 28 in 1990 to 6 in 2001. This merger wave resulted in the establishment of a new marketing co-operative that accounts for the sale of more than half of all fruits and vegetables produced in The

Netherlands: VTN/The Greenery.[5] The auction clock has lost its dominance as a price determination mechanism; nowadays two thirds of all produce is sold by way of contract. Auction co-operatives have taken up new functions, such as marketing, innovation, wholesale and processing. The co-operative has lost part of its logistic function, as the new sales instruments make it possible to transport products directly from growers to customers.

At the same time, growers have established many new growers' associations. Between 1993 and 2001, 74 new associations of fruit and vegetables growers were established (Bijman, forthcoming). Some of these new associations compete with the restructured auction co-operatives in setting up special marketing programmes for members' products. Others only function as bargaining associations, negotiating with wholesalers, retailers and processing firms.

In this paper we will analyse the combined development of restructuring the traditional auction co-operatives and establishing new growers' associations. Our focus is on how asset ownership affects investments, particularly those in specific assets. As ownership entails two types of rights (i.e., control rights and income rights), it can affect investment incentives in different ways. Hendrikse and Bijman (forthcoming) have studied the effect of the allocation of income rights in a special type of co-operative on individual investment incentives. They analysed the dilemma between self-selection and countervailing power in bargaining associations that apply the equality principle. A heterogeneous association frustrates high-quality growers, but is strong in terms of market power for the growers collectively. The homogeneous association encourages growers to invest in specialty products, but has low countervailing power. Using a game-theoretic model, the authors have shown that when the quality variation in a heterogeneous co-operative extends beyond a certain level, high-quality growers will be better off in a homogeneous association despite the lack of market power.

This paper analyses the combined effect of income rights and control rights on the efficiency of marketing co-operatives in the fresh produce chain.[6] Because co-operatives apply democratic decision-making and consensus-building, part of the incentives used in a co-operative are of a collective kind. This is efficient as long as the co-operative is homogeneous, that is, all members have the same interests. However, when the co-operative becomes more heterogeneous in member interests, incentives for particular growers may no longer be optimal.

This paper is structured as follows. In Section 2 we present a brief survey of the economic literature on what ownership in a co-operative means, and what impact it may have on investments by member firms and co-operative firms. Section 3 shows that there are several options for organising the fresh produce chain. Due to the above-described changes in market conditions, the relative efficiency of the various types of organisation has changed. In Section 4 we describe the end of the auction, its causes and its alternatives. Section 5 analyses the effect of differentiation in supply and demand on the marketing co-operative, particularly on its investments in marketing assets. Section 6 concludes with the challenges that heterogeneous marketing co-operatives in the fruit and vegetable industry may encounter.

## THE CO-OPERATIVE AS A SPECIAL FORM OF OWNERSHIP

A co-operative is a special kind of ownership: farmers collectively own assets in another stage of the production and distribution chain. As such, a co-operative is also a form

[5] The name of the new co-operative society is VTN, the name of the new co-operative firm is The Greenery. VTN is 100% shareholder of The Greenery.

[6] Efficiency of organisation means there is no organisation that generates a better outcome for the people involved (Milgrom and Roberts, 1992: 22).

of vertical integration. There are three broad determinants of vertical integration: technological economies, transactions economies, and market imperfections (Perry, 1989). For marketing co-operatives[7], technology is not an issue. Since the member firms and the co-operative firm are not integrated in a technical sense – they carry out separate production processes - technological economies cannot be the reason for farmers to vertically integrate. Market imperfections are the traditional economic explanation for vertical integration in a co-operative (LeVay, 1983). Due to economies of scale in processing and marketing, farmers are confronted with oligopolistic market structures. Through collective sale of farm products, a co-operative poses a countervailing power vis-à-vis the market power of processors/marketers. However, the existence of market power in neighbouring stages of the production and distribution chain is in itself not a sufficient explanation of why farmers carry out these economic activities themselves (Bonus, 1986). A bargaining association would be able to neutralise asymmetric market power. This brings us to the third reason for vertical integration – transaction costs. By vertically integrating, firms can achieve economies on transaction costs that arise due to the specific characteristics of the transaction (Williamson, 1985). Thus, a marketing co-operative is an organisational solution to the problem of high transaction costs in the exchange relationship between farmer and processing/marketing firm. We will elaborate on this transaction cost explanation for the existence of marketing co-operatives.

Transaction cost explanations of vertical integration start from the axiom of the incompleteness of contracts. This means that all real world contracts leave room for dispute and opportunistic behaviour. By bringing a transaction within the boundaries of the firm, inefficiencies resulting from incomplete contracts in situations of diverging interests can be prevented. This implies that the assets used for the transaction come under single ownership. Following Hansmann (1996), we define ownership as the combination of residual rights to control and rights to residual earnings. Residual rights are all rights that are not expressly assigned to another agent (including the state). Grossman and Hart (1986) have argued that the allocation of residual rights of control has important efficiency effects, because it influences the bargaining position of agents to a contract after they have made relationship-specific investments. In the absence of comprehensive contracts, property rights largely determine which *ex post* bargaining position will prevail. An agent owning assets that are essential for value creation in the relationship is in a position to reap at least some of the benefits from the relationship that were not explicitly allocated in the contract by threatening to otherwise withhold the assets. The implication of this incentive effect of asset ownership is that agents negotiating a contract about asset use may make *ex ante* investments that are suboptimal (or inefficient) if they have a weak bargaining position about *ex post* use of the asset.

Vertical integration can be defined as holding the residual control rights to assets located in two (or more) stages of the production and distribution chain. Combining control rights over assets in more than one stage of the chain may improve the efficiency of transactions, for several reasons. It improves the incentive for *ex ante* investment in assets specific to the transaction by preventing an *ex post* hold-up; it prevents the costs of *ex post* haggling over continuation of asset use; it aligns interests in the use of the assets; it improves information flows related to the assets; and it improves the co-ordination of connected transactions (thus improving options for systemic innovations).

A marketing co-operative is a special type of vertical integration because a number of firms (so-called member firms) in one stage of the chain collectively own a co-operative firm in another stage of the chain. This collective ownership of assets brings about specific

[7] Our analysis focusses on the marketing co-operative, that is, the co-operative that sells (and sometimes processes) the products of its members.

challenges to efficiency, as it may lead to problems in raising equity capital and in decision-making. The horizon problem, the free rider problem and the portfolio problem prevent efficient investment by member firms in the co-operative firm (Cook, 1995). This is particularly problematic if competition urges the co-operative firm to invest in risky activities like marketing and innovation. Increased co-operative effort on innovation and marketing may also lead to laborious decision-making. When the innovation and marketing activities are based on differentiation in the products that members supply, the interests of the members become heterogeneous. Because decision-making in co-operatives is based on democratic procedures and consensus-building, diverging interests raise decision-making costs. A loss of homogeneity reduces member commitment and increases the (perception of the) free rider problem, thus being a disincentive for additional equity investments

## THE STRUCTURE OF THE FRESH PRODUCE CHAIN

The basic structure of the fresh produce chain consists of three parties: grower, wholesaler and retailer (Figure 1). The relevant assets in this chain are farm, reputation, and store; the grower owns the farm, the wholesaler owns the reputation and the retailer owns the store. Transactions are organised in spot markets or contracts. We call this basic chain organisation for producing and distributing fresh produce a Type 1 chain.

While Type I is viable for a very large producer or for producers of unique products, for most growers it is an undesirable situation. When a grower sells his products individually, he is in a disadvantageous bargaining position vis-à-vis the customer. Not only is he faced with asymmetric information on final demand, he is also confronted by asymmetric market power. Growers have found various solutions to these problems, while at the same time obtaining economies of scale in the sales process. One such type is the bargaining co-operative (Type II). Its main function is to bargain with customers about price and other delivery conditions on behalf of all members together. The bargaining association establishes countervailing power in an oligopolistic (or even monopolistic) market. Another type is the auction co-operative (Type III). In the auction the problem of asymmetric information is solved, and economies of scale in administration, logistics, and insurance are obtained. By bringing together many products and buyers in a transparent market, the highest possible price is obtained. By delegating the sales function to the co-operative firm running the auction, growers can specialise on production. An auction co-operative is a form of vertical integration, where growers collectively own the assets needed in the sales process. Through this ownership, growers are the primary beneficiaries of the auction; it is organised in such a way as to optimise grower income. Individual contracting, bargaining association and auction can all be found in practice. Which type of chain organisation is most efficient depends on the particular characteristics of producers, products and markets.

Growers that want to invest in the marketing of their products set up a marketing co-operative (Type IV). Investing in marketing means building up an asset named 'reputation' (often visualised by a brand name). The tasks of the co-operative firm are to protect and enhance the value of the reputation. However, the marketing co-operative will soon find out that it competes with the wholesaler, who also owns an asset 'reputation', and that the success of its investments is strongly influenced by the behaviour of the wholesaler. The latter has an information advantage regarding the demands of the retailer. Since fresh produce needs careful and time-critical handling, the wholesaler can influence the quality of the final product, and thus affect the quality reputation of the marketing co-operative. To prevent this dependency relationship, the marketing co-operative may become a wholesaler itself, by starting new wholesale activities or acquiring an existing wholesale firm. The grower-owned marketing and wholesale co-operative directly trades with the retailer (Type V).

| Type | Chain Organisation for Fresh Produce | | |
|---|---|---|---|
| I | GROWER | → WHOLESALER | → RETAILER |
| II | GROWER - bargaining association | → WHOLESALER | → RETAILER |
| III | GROWER - auction co-op | → WHOLESALER | → RETAILER |
| IV | GROWER - marketing co-op | → WHOLESALER | → RETAILER |
| V | GROWER - marketing/wholesale co-op | → RETAILER | |

GROWER (capital letters) = independent firm; auction co-op (small letters) = dependent firm;
= ownership structure, the independent firm owns the dependent firm;
→ = intrafirm transaction; -- = interfirm transaction.

*Figure 1. Five types of chain organisation for fresh produce.*

These rather stylised schemes of chain organisation show what assets growers may own beyond the production stage of the chain. According to Transaction Cost Economics, this asset ownership is efficient when it protects relationship-specific investments. However, since this ownership is collective, there are also disadvantages involved. We will now analyse the adverse effects of collective ownership in a marketing co-operative responding to increasing differentiation in supply and demand.

## THE END OF THE AUCTION

Traditionally, the auction played a central role in the marketing of Dutch fresh produce. In 1990, more than 90 percent of all greenhouse vegetables, 78 percent of all fruit, and 50 percent of all open field vegetables were sold through the auction (Bijman et al., 1994). The main functions of the auction co-operative were price determination through the auction clock, sales administration, logistic services, and quality classification and inspection (Meulenberg, 1989). In addition, the co-operative provided insurance against buyer default, and executed a minimum price system funded by the growers themselves.

Due to changes in the market conditions for fresh produce, it became clear that the auction had a number of disadvantages. Buyers complained about the auction as a sales mechanism, because:

- they had to send agents to several auction locations, which leads to high purchasing costs;
- they had to pay higher prices when they wanted to buy large quantities of the same products (for instance for retail promotions);
- they were faced with volatile prices (which retailers do not like);
- they could not obtain special delivery conditions (time, quality, special packaging, etc.).

Growers also became dissatisfied with the auction co-operative, because:

- large growers were subsidising small growers (due to a lack of differentiation in auction tariffs);
- quality improvements were not rewarded because products were sorted into quality classes and then sold anonymously in auction lots combining products of several producers;
- specialty products did not get the required special marketing effort (the auction co-operative did not want to start product-specific marketing activities, as it did not fit with the traditional policy of equal treatment);
- in the democratic decision-making process, the votes of the innovative growers were far too few to be able to force a change of strategy;
- transporting all produce to and from the auction meant inefficiency in logistics;
- in general, the differentiated demands of consumers and retailers could not be met.

It was clear, in the early 1990s, that chain organisation III no longer formed an efficient organisation for marketing fresh produce in the Netherlands. Several other types of chain organisation have developed in response to the increasing differentiation in supply and demand and the inability of the auction co-operative to accommodate this process (Bijman, forthcoming). First, a number of auction co-operatives merged and were transformed into the new marketing co-operative VTN/The Greenery. Subsequently, VTN/The Greenery acquired several wholesale companies (Bijman et al., 2000). Thus, the chain organisation went from III to IV to V. Even before VTN/The Greenery was formed, a number of large and innovative growers left the auction co-operative and started to contract individually with wholesalers (Type I). Other growers who left the auction co-operative (or left VTN/The Greenery) formed growers' associations to collectively bargain with wholesalers (Type II). Some of these new growers' associations transformed into marketing co-operatives as growers wanted to gain control over the marketing of their products (thus shifting from II to IV). Often this concerned specialty products, requiring special marketing efforts to obtain the highest price possible.

The marketing co-operative (Type IV) and the marketing/wholesale co-operative (Type V) that replaced the auction co-operative may have a hard time developing into a stable organisation and in proving their viability in the fresh produce industry. They may encounter difficulties in coping with heterogeneity of member interests and in organising co-ordinated investments in two stages of the production and distribution chain. In the next section we will elaborate on these challenges.

## PRODUCT DIFFERENTIATION AND THE CHALLENGES OF THE MARKETING CO-OPERATIVE

Differentiation in consumer demand provides opportunities for growers to develop and produce specialty products. These growers want their products to maintain their special identity throughout the production and distribution chain. Ideally, consumers recognise this product in the store and are willing to pay a higher price for it. Maintaining the special identity throughout the chain requires product-specific effort of all firms participating in that chain. Thus, the wholesaler and retailer should make a product-specific marketing investment. A similar situation exists when the grower makes customer-specific adjustments in his production (and packaging) process.

Transactions with specialty products requiring special marketing investments are characterised by asset specificity. Such relationship-specific investments are vulnerable to *ex post* hold-up. Due to differences in firm size the risk of hold-up is much larger for the grower than for the wholesaler or retailer. If the risk of hold-up is serious enough, the grower may choose between (1) not making the relationship-specific investment in production (which entails an efficiency loss) and (2) acquiring the firm that should make the relationship-specific investment in marketing. It follows that a grower selling specialty products requiring accompanying investments in marketing may acquire assets in downstream stages of the chain to make sure that these investments are being made and that there is no risk of hold-up. Since growers normally cannot make these acquisitions individually, they form a co-operative to do so. The result is a marketing/wholesale co-operative (Type V).[8]

Transaction cost economics states that co-specialised assets will be held together. Klein et al. (1978) have argued that investments in establishing a brand name are so tightly connected to investments in production that a brand name is always owned by the producer. The importance of a brand name is that is conveys information about the product or the producer. In other words, it stands for a certain reputation. A marketing co-operative of fruit and vegetable growers that wants to establish a special reputation with retailers has to acquire wholesale assets to be able to trade directly with those retailers. These wholesale assets are needed for building and protecting the growers' reputation. This is what VTN/The Greenery has done. It has acquired a wholesale company to be able to connect production investments and marketing investments in building a reputation among its retail customers of being a reliable supplier of quality produce.

Investing in marketing and acquiring wholesale assets to protect these investments brings particular challenges for the marketing co-operative. One such challenge relates to financing. Cook (1995) has shown that raising additional equity capital from the members may be difficult, due to vaguely defined property rights. Cook and Illiopoulos (2000) have presented remedies for solving the weak investment incentive problem. Their main solution is to strengthen individual ownership in the co-operative in combination with individual contracts between members and the co-operative firm. While this solution may work for a homogeneous marketing co-operative, whose members only supply one type of product, it is doubtful whether it will work for more heterogeneous co-operatives like the marketing co-operative for fruits and vegetables. The heterogeneity among the members of this co-operative may prevent efficient investments.

As we have shown above, establishing a marketing co-operative (Type IV) or a marketing/wholesale co-operative (Type V) is a response to growing heterogeneity in demand. However, differentiation in the products supplied to the co-operative firm leads to increasing heterogeneity in member interests. Products may require different types of marketing investments, and the costs of the marketing effort may differ for the various products.

A distinguishing feature of most voluntary producer organisations, such as co-operatives, is the proportionality principle regarding allocation of costs and benefits. Members benefit from their co-operative in proportion to their patronage. However, there are always costs and benefits that cannot easily be allocated to a particular product transaction or a particular member. These costs and benefits are allocated on the basis of the equality principle. Equal treatment prevents the distribution of the co-operative costs and benefits from

[8] Usually it is not an individual grower but a marketing co-operative that acquires wholesale assets (this is a shift from IV to V).

becoming a 'political' issue that leads to influencing costs (Milgrom and Roberts, 1990) and might endanger the cohesion of the voluntary organisation (Søgaard, 1994).

The equality principle may raise internal opposition when the membership becomes more heterogeneous and when the co-operative firm initiates non-traditional activities. Co-operatives become more heterogeneous when the members supply more different products requiring accompanying activities by the co-operative firm. When the co-operative firm initiates activities whose costs are not in direct proportion to the volume or the value of the products supplied by the members, the equality principle may lead to cumbersome decision-making on these activities. Hansmann (1996) has shown that homogeneity of owner interests is extremely important in designing efficient ownership structures.

As a result of increasing heterogeneity in member interests, growers may leave the co-operative. Particularly those growers that produce high-value or unique products will be the first to leave the heterogeneous marketing co-operative. They shift to other types of chain organisation, like trading with a wholesaler individually (Type I), establishing a bargaining association with like growers (Type II) or starting their own marketing co-operative, also with like growers (Type IV). However, while this may improve homogeneity of member interests in the new association or co-operative, it comes at a cost. The new association or co-operative generally has less market power than the heterogeneous but large marketing co-operative.

## CONCLUSIONS

In this paper, we have studied the effect of residual income rights and residual control rights on efficient investments in the fresh produce chain. Because decision-making in co-operatives is characterised by democratic procedures and consensus-building, growers will not see their individual interests fully met while being a member of a heterogeneous co-operative. To fully exploit the market for specialty products, the growers' production investment requires an accompanying marketing investment by the co-operative firm. However, the co-operative may not be willing to make this product-specific investment (due to opposition by the majority of the membership) or the benefits of the investments are divided among all members due to the equality principle.

Being a member of a large marketing co-operative yields the advantage of countervailing power. However, in the fruit and vegetable market, a large marketing co-operative will be a heterogeneous co-operative because of the many different products the members supply. When the marketing co-operative vertically integrates into wholesale in order to establish or acquire the reputation asset, the heterogeneity becomes problematic, for two reasons. First, members of a heterogeneous co-operative may not be willing to supply the equity capital to invest in establishing the reputation asset. Second, investments in marketing are not directly linked to production investments by the members, giving those members that produce high-value products an incentive to leave the heterogeneous marketing co-operative and establish a new homogeneous association or co-operative. When the marketing co-operative is trying to establish a quality reputation vis-à-vis retailers, the exit of members producing high-quality products makes it even more difficult (and costly) for the co-operative to build that reputation. It seems that the large, heterogeneous marketing/wholesale company has found itself in a Catch-22 situation.

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