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THE TRADITIONAL CO-OPERATIVE MODEL AND BEYOND – THE CASE OF DANISH CROWN

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ABSTRACT

A large share of the agricultural co-operatives world-wide are organised according to the so-called traditional co-operative model, implying i.a. mainly unallocated equity capital, the legal form of a society with open membership, members enjoying delivery rights, and governance according to the principle of the one member, one vote. By applying this model agricultural co-operatives may get a competitive advantage of cost-leadership on commodity markets.

There are, however, different ways of implementing the model, some evidently more successful than others. The Danish interpretation of the traditional co-operative model seems to be exceptional, as judged by the development of Danish market shares, price levels etc. Hence, this article intends to explain the logic behind the Danish model of Co-operatives.

A second purpose of the article is to investigate whether the current Danish model of co-operative will be instrumental also in the future agribusiness, and if not, which adaptive measures could be undertaken, i.e., which optional models are to recommended. Throughout the article, the dominating meat co-operative, Danish Crown, serves as a case to illustrate the argument.

1. Co-operative models as determinant for competitiveness

The agricultural sector in Denmark has been and still is very successful. Considering that the marketing of the agricultural products to an extremely high degree is conducted by farmer co-operatives, it is reasonable to guess that this organisational type accounts for the success.

Agricultural co-operatives have, however, strong market positions also in other countries, though most often with less business success than the Danes. This observation may lead to hypothesis that the Danish success may be explained not only by the co-operative dominance but also by the way the co-operatives are organised in Denmark – the Danish model. Representatives of the Federation of Danish Co-operatives also assert that the choice of co-operative model is essential for the success. While the so-called *traditional co-operative model* is very widespread in most countries, the Danes have developed a special form of this organisational model. There is a special Danish co-operative model that might be the key factor behind the success of Danish agriculture on the world markets.

The first aim of this paper is to investigate this hypothesis through a theoretical analysis of the traditional co-operative model as applied in Denmark, thereby using Danish Crown as an illustration. Hence, the paper discusses *the economic logic behind the Danish model for agricultural co-operatives.*

During recent years, agribusiness has become increasingly complex which can be seen in, i.a., the wave of mergers, acquisitions and alliances that keeps on sweeping the Western countries. This applies to all industries, in both manufacturing and retailing. Among the underlying factors especially a number of political decisions should be mentioned. The establishment of the Single Market within the European Union and later the European Monetary Union mean that large scale business has competitive advantages. The liberalisation of the agricultural policies both in America and Europe raises the competitive pressure at all levels of the agro-food chain. Recurrent GATT and later WTO negotiations open up the international markets.

These changes imply a price squeeze on virtually all markets. Most producers respond to this by differentiating the products and segmenting the markets, hoping to find less price sensitive buyers. The differentiation strategy seems to be favoured by the rising standard of living, stimulating the consumers to seek a more individualistic consumption pattern. When it comes to product differentiation and marketing of highly processed products on segmented consumer markets, traditionally organised co-operatives have, however, some difficulties. This organisational model has its strength when large volumes of produce are processed to a limited extent and then marketed to large markets.

This gives rise to the second issue to be addressed in this article, viz., *whether the Danish agricultural co-operatives are able to handle the new market conditions within the framework of their existing co-operative model.*. Should the current model

remain, should it be more or less altered, should it remain but be supplemented with another organisational model, or must it be abandoned and replaced by a new model?

The two questions are dealt with in one section each, viz., sections 3 and 4. In order to ease the argument, the dominating slaughterhouse co-operative, Danish Crown, serves as a case throughout this sections. Hence, this co-operative is presented in the following section 2.

The theoretical analyses of the traditional model as well as the modified models that might supersede the traditional one as the market demands are changing, will comprise various neo-institutional theory. As the topic concerns co-operatives, the transaction cost theory is but natural, but also property rights theory and agency theory as well as some neo-classical economic theory are appropriate.

2. Danish Crown

2.1. The Danish pig meat industry

The meat industry in Denmark is highly concentrated. This is the result of numerous mergers during the course of the last few decades. (See Table 1) Today, there are only three slaughterhouse firms left, all organised as marketing co-operatives.

Table 1: The structure of the Danish meat industry 1970–1998

End of the year	1970	1980	1990	1997	1998
Co-operative slaughterhouses	50	18	5	4	3
IOF slaughterhouses	4	2	1	0	0
Number of firms in total	54	20	6	4	3
Number of plants, co-ops	56	34	25	22	22
Number of plants, IOFs	4	2	2	0	0
Number of plants, total	60	36	27	22	22

The present Danish Crown is the result of a merger that took place in 1998. The partners were the former Danish Crown and Vestjyske Slagterier, both operating at Jutland and Funen. Thereby the number of Danish meat co-operatives was reduced from four to three. The remaining ones, Steff-Houlberg, located at Sealand, and Tican (Thisted-Fjerritslev), in northern Jutland, are considerably smaller. (See Table 2)

Table 2: Number of pigs slaughtered at the Danish co-operatives in 1997 and 1998.

Slaughterhouse co-operative	1998 animals	%	1997 animals	%	Change in % 1998:1997
Danish Crown	10.146.492	49,7	9.525.773	49,7	+6,5
Vestjyske	6.216.021	30,4	5.918.336	30,9	+5,0
Steff-Houlberg	2.916.093	14,3	2.661.168	13,9	+9,6
TiCan	1.143.549	5,6	1.047.931	5,5	+9,1
Total	20.422.155	100	19.153.208	100	+6,6

In connection with the merger, the jointly owned subsidiary ESS-Food was dissolved. The partners were Danish Crown, Steff-Houlberg and Tican, i.e., after the merger the two latter partners lost an important export channel. They have thereafter bought a firm in the U.K. to get better access to that important market. Nevertheless, the two smaller co-operatives may have lost market power due to the merger.

2.2. The Danish Crown group

Danish Crown is the largest slaughterhouse group not only in Denmark but also in Europe with an annual slaughtering of about 16 million pigs and 360,000 cattle. The slaughtering of pigs is equivalent to almost 80 percent of the Danish pig slaughtering and 7.6 per cent of the pigs slaughtered in the European Union.

The Danish Crown Groups' total turnover in 1999 was 36.5 billion DKK. The parent co-operative had a turnover of 18.4 billion DKK.

Danish Crown has wide-spread international activities. Sales companies have been established in the most important markets abroad and Danish Crown also has slaughtering and processing activities outside Denmark. The group's sales have a strong international orientation and about 80 per cent of pig production is exported.

In 1999, there were about 25,500 members which include pig, sow and cattle producers. Membership is personal and members are admitted if they are active producers of pigs, sows or cattle and commit to the bylaws of Danish Crown which for instance imply a 100 per cent delivery obligation. This figure will be modified to a 85 per cent obligation in 2002 as a condition for the European Union antitrust authorities' approval of the merger in 1998 with the Vestjyske Slagterier. The structure of Danish Crown is shown in Figure 1.

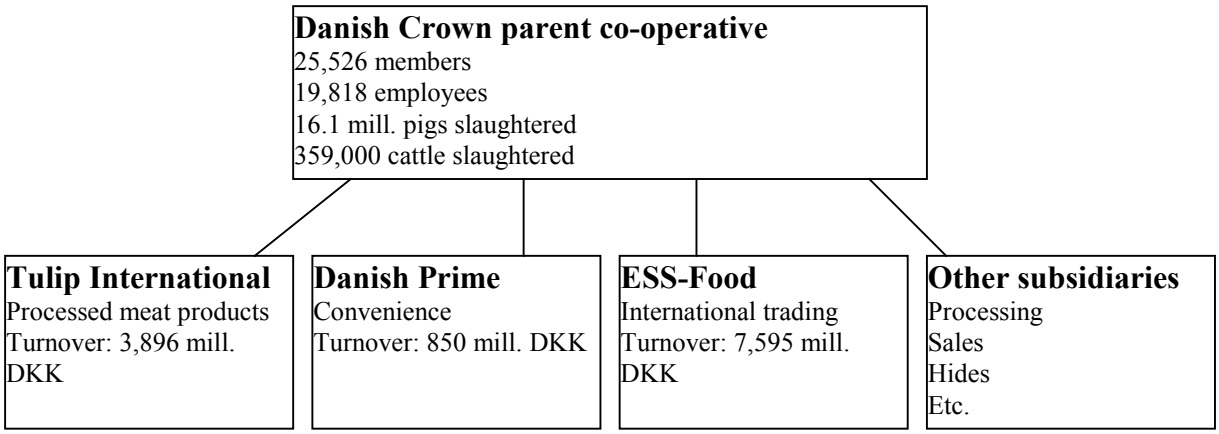


Figure 1. Danish Crown parent co-operative and examples of some of the subsidiaries. 1998/99 figures. Source: Danish Crown annual report.

In addition to the basic slaughtering activities the group includes a number of subsidiaries with activities related to the parent co-operative. *Tulip International* is a processing company which produces bacon and canned products on the basis of meat. Tulip International has production facilities in Denmark and United Kingdom. *Danish*

Prime produces convenience products and is oriented towards the domestic market and the Nordic region. *ESS-Food* is an international meat trading company which trades all kinds of meat also from other sources than Danish Crown itself.

2.3. Heterogeneous membership

2.3.1. Differentiated production

In 1996, Danish Crown acquired the cattle slaughterhouse Dane Beef, offering cattle producers membership of the co-operative. By including cattle producers the membership got less common interests as compared to the previous situation where the membership included only pig producers. The solution was to divide the membership into two strictly separated categories, each with more homogeneous interests.

During the subsequent year Danish crown presented a strategy aiming at differentiating its intake of pigs into a number of breeds. Traditionally, all pigs were of the multi-pig type with specific characteristics regarding slaughtering weight and meat contents. From 1997, the pigs are divided into a number of different breeds. Each breed is treated separately, both in the production chain and organisationally. The introduction of differentiated raw material from members represents a major change with respect to members, structure of the co-operative firm and production control.

2.3.2. The multiple string co-operative model

In most traditional co-operatives, raw material intake from members is homogeneous and products are sold under almost perfect competition. When differentiated markets are to be served, some of the differentiated meat products must be sold on niche markets where price levels and quantities are closely related. Therefore, close control of the differentiated products is necessary to make sure that the markets are satisfied. This means that only a fixed quantity of the differentiated product is produced and that a limited number of members are given access to produce the special products.

When members' production differs and is sold under different market conditions the membership becomes less homogeneous with respect to member interests. Their interests as concerns price fixing, quantity control and quality requirements vary from one member group to the other.

In traditional co-operatives, geographical representation is the focal point of member governance and the structure of the member governance system. When members' production is differentiated, the interest of the various producer groups vary across geographical locations and thus, informal interest groups with members from several geographical areas appear.

In some co-operatives farmers have formed groups, independently of the existing structure of the member governance system, in order to represent their specific

interests in the co-operative. In some cases, these groups have even been established as a protest against the reluctance in the established system to adjust to the fact that producers of differentiated products have special interests.

In the member governance system of traditional co-operatives, decisions are made by bodies (e.g. board of directors and board of representatives) representing all members. If members' interests are different because of differentiated production the governance system with geographical representation might imply less effective decision making. Some matters might be relevant only to groups of members while in other cases there may be disagreement among members due to heterogeneity in the member interests.

The traditional marketing co-operatives' mission is to process and market members production. Consequently, the traditional co-operatives' role in controlling members' production is none or at least indirect. Nevertheless, this indirect role is not sufficient to meet the control and traceability demands required for a co-operative with differentiated production.

Table 3. Comparison of a traditional co-operative and a multiple string co-operative.

	The traditional Danish co-operative model	**The multiple string co-operative model**
Raw material	∗ Standard	∗ Differentiated
Market for selling final product	∗ Perfect competition in the market	∗ Imperfect competition in the market
Members	∗ Homogeneous – one group	∗ Heterogeneous ∗ Several producer groups
Member interests	∗ Similar	∗ Different (special interests)
Member governance	∗ Geographical representation	∗ Producer group representation
Rights and obligations	∗ Everyone has the same rights and obligations	∗ Varies, depends on the producer group
Decision makers among members	∗ All members (indirectly)	∗ Selected producer groups (in some matters)
Price system	∗ Uniform – a common system	∗ Several systems ∗ Guaranteed prices
Organisation of the enterprise	∗ One string	∗ Divided into divisions according to product areas ∗ Functions placed into subsidiaries
Control by the co-operative of members' raw materials	∗ None, or limited, indirect control	∗ Close, direct control ∗ Quantity control ∗ Geographical control ∗ Restrictions in form of production ∗ Tradable delivery rights ∗ Conversion schemes

The Federation of Danish Co-operatives introduced in 1999 the term *multiple string co-operative* to describe the structure of a co-operative with differentiated production (Multiple String Co-operatives, 1999). The multiple string co-operative model is a variant of the traditional co-operative model. Table 3 shows some of the attributes of this model compared to the traditional co-operative model, hitherto applied in the Danish agriculture.

2.3.3. Differentiation in Danish Crown

In 1997, Danish Crown presented its differentiation strategy for pigs according to which the members' production of pigs should be differentiated into several types. According to this strategy the traditional multi-pig was to be supplemented by production of a special UK pig for the British market, Euro-pigs especially for the German market and several special breeds for the domestic market. Danish Crown expected to differentiate about half of the traditional multi-pig into special breeds.

The differentiation strategy made members more different with regard to their production, their affiliation to Danish Crown and the payment for their produce. In addition, Danish Crown also slaughters cattle, sheep and lamb so in total there are several producer categories in the co-operative. Hence, Danish Crown divided the co-operative into a pig and cattle division, each of which is governed by a committee with pig and cattle producing members, respectively. These committees may be considered as an addition to the traditional governance system that is solely based on geographical representation.

2.4. Market conditions

As the markets for most of the differentiated pig meat are quantity sensitive, a successful market strategy demands strict quantity control on the farmer level. Hence, Danish Crown signs contracts with all farmers of special breeds allowing them to deliver a specified quantity.

The pricing of differentiated products represents a problem as members have expectations about the conditions for price fixing. Co-operatives in some Danish agricultural industries base their prices on the conditions on the final market for the differentiated products, while the tradition in the pig industry is to set prices of differentiated products on additional costs at the farm level. Thus, Danish Crown pays a premium on top of the price for multi-pigs. In order to stimulate the conversion into differentiated pig production an extra bonus is paid which exceeds the extra costs on the farm level. Furthermore, Danish Crown offers a long run guarantee for the premium price, covering several years.

Danish Crown signs contracts with all farmers of differentiated pigs. By means of these contracts both quantity and the geographical allocation of production is controlled by the co-operative. Pig producers' commitment to follow the specific requirements is monitored by the co-operative. The geographical control implies that only farmers in certain geographical areas may produce differentiated pigs, the rationale being that thereby it is possible to reduce transportation and slaughtering costs.

2.5. Bylaw committee - strategic debate

To cope with the challenges resulting from the merger with Vestjyske Slagterier and the future challenges in the meat industry, Danish Crown has set up a "bylaw

committee" with representatives from all levels in the member governance system. The committee debates and addresses various subjects in the co-operative, for instance internationalisation, organisational structure and financing.

The debate in Danish Crown's bylaw committee is held open. Members are kept informed and have the opportunity to influence the process by sending proposals to the committee and by taking part in debates and member meetings. It is planned that the work of the bylaw committee will result in a proposal for new bylaws for the Danish Crown group.

3. The traditional Danish co-operative model

3.1. The rationale of traditional co-operatives

Almost all Danish co-operatives are organised according to a so-called traditional co-operative model. The characteristics of the traditional co-operative model can be interpreted as means whereby the co-operative can increase the supplies from the members, whereby it can reap the largest possible economies of scale (Sexton 1986; Nilsson 1998). (See Table 4)

It is generally recognised that in the collection and the primary processing of agricultural commodities *economies of scale* are substantial. The larger the production, the lower are the costs per unit and then, provided that the revenues per unit are more or less independent of the sales volume of the individual co-operative, the larger are the profits. Hence, a traditionally organised co-operative is able to pay a higher price to the farmers than any other organisational type would, or otherwise offer better trade conditions. So, it is no wonder that agricultural co-operatives have become dominating at a larger number of raw product markets. (Agricultural ..., 1997)

An important proviso is that the co-operative should operate on markets where its sales volumes do not influence the price negatively. This is supported by empirical observations. The traditional type of agricultural co-operative has generally been successful on markets so huge that the co-operative's volume is only a very small fraction, and likewise on markets where governmental intervention secures a price level that is independent of the individual co-operative's sales volume. A quick look at the major markets in most countries reveal that very often if not most often co-operative firms dominate in selling unprocessed or slightly processed agricultural raw products while their market share generally falls further downstream the value chain. Traditional co-operatives constitute, just simply, an exceptional tool for selling large quantities of commodities at low prices. Using Michael Porter´s vocabulary (1980), such co-operatives are a superior way of applying a *cost leadership strategy*.

Table 4. The effects that the traditional co-operative model has on economies of scale.

Characteristics a the traditional co-operative model	Effects on the economies of scale
The ownership is in the form of *a co-operative society* – not a PLC or any other legal form – and *this society is open,* i.e., new members can easily join the society. Hence, there is *free entry.*	Societies with open memberships makes it easy to recruit new members as suppliers, thereby increasing the production volume.
The enterprise is collectively owned as it is owned by the society. There are often no individual ownership to the equity, or if there is, this is limited and under collective control.	The unallocated capital as well as the gratis allocated capital means that the co-operative increases the volume by raising the price paid to farmers.
The open membership as well as (frequently) the lack of ownership shares imply that there is *no trade of shares,* and hence, the members can *not realise changes in the value of the assets.*	The focus is at the product price paid, not at the farmers' investments, and product price is the most effective instrument to attract volume.
The members' governance of the firm is equal, irrespective of their volume of trade with the co-operative or their volume of shares, if any. *One member, one vote* applies. Hence, the *control is fully in the hands of the members.*	Equal voting power, like many other socially attractive elements, belong to a so-called co-operative ideology, which has the effect of convincing the largest possible number of farmers to become and remain as members.
The profits made by the co-operative is not reimbursed to the members as return on investment but as *patronage refund,* i.e., it is allocated in proportion to the members' deliveries to the co-operative.	The patronage refunds raise the farmers' compensation for the products delivered, and so they will probably deliver a larger quantity
The members enjoy full *delivery right,* i.e., the co-operative is obliged to buy everything the member may deliver.	The delivery right expresses the co-operative's willingness to receive as large a volume as possible.

An important element in the traditional organisational model is that the individually owned (allocated) capital is small and that the members do not receive any remuneration for their investment in the co-operative society. Due to the members' small investments the gratis capital is an acceptable sacrifice for them. According to transaction cost theory the member investments in the co-operative have the purpose of safeguarding their large investments in their farm enterprises, and so, the amounts should be as small as possible – this is not meant to be risk capital but rather its opposite.

Co-operative firms are often accused of being inefficient due to vaguely defined property rights (see for example Condon 1990; Nilsson 2000). This criticism is especially directed at traditional co-operatives, also because this organisational model is the dominating one. The root of these problems is that the members are individualistic actors and will behave in ways that do not fit with the collectivist traits of traditional co-operatives. This argument is easy to understand, and the co-operative business sector is abundant with examples of these problems that cause economic hardships of many co-operative organisations:

- *The joint property or free-rider problem:* Free-riding behaviour is encouraged in collective organisations, i.e., self-interest seeking members reap benefits without contributing accordingly.

- *The horizon problem:* No member wants the co-operative to make investments with a longer pay-back period than his own remaining member period, and hence, co-operatives are normally under-invested.
- *The portfolio problem:* Given heterogeneity within the membership as regards risk preferences, a co-operative's investments will be inoptimal for practically all the members.
- *The control or follow-up problem:* An individual member has very limited incentive to control the management, and also very limited capability.
- *The influence cost or decision-making problem:* When memberships are heterogeneous, the management has difficulties in judging which actions to take and how these affect different member categories.

These agency and property rights problems do, however, not apply generally to co-operatives – it should be remembered that co-operatives have existed for more than a hundred years and lots of co-operatives run flourishing businesses. Rather, these problems are indicators of lacking member commitment. i.e., if the members do not consider the co-operative to be instrumental in ameliorating the market failures which they would face without any co-operative business, the five above-mentioned problems arise (Hakelius 1996). For members to be committed in their role as users, the investments of the co-operative must be limited, otherwise the problems above appear. So, the co-operatives' operations must be closely related to the members' own operations. (Nilsson 2000).

3.2. The Danish version of the traditional co-operative model

Lots of agricultural co-operatives world-wide are organised according to the traditional model, not the least most old and large ones. Hence, considering the diversity as to degree of success among co-operatives, one may conclude that the traditional co-operative attributes do not automatically foster success. Co-operatives do not necessarily reach such low cost and price levels that they become competitive, and monitoring them may sometimes be weak, possibly as a consequence of property rights problems.

The explanation is that there are numerous ways of applying the traditional model, i.e., a variety of other organisational attributes may be added as well, and these attributes may account for the varying degrees of success or failure. One of these is the multiple string model, another one is the model that has hitherto been prevalent in Denmark, etc (Søgaard 1994).

Representatives from the Federation of Danish co-operatives have suggested that the success of Danish agricultural co-operatives is due to a number of such attributes, which constitute additions to the general attributes of traditional co-operatives:

A. Economic objectives – not social, political, or anything else,
B. Bottom-up organising and control; initiatives from the grassroots,
C. Independence and self-governance,
D. Single-purpose co-operatives,
E. Loyalty, attained by good performance,

F. Homogeneous memberships,
G. Balance between rights and obligations,
H. Continual education and debate.

While these attributes are identified from a Danish perspectives, foreigners may see a number of other characteristics of Danish co-operatives, here ordered according to the general definition of co-operatives, i.e., a firm where the users are the owners, the users are in control and the users reap the benefits from the firm (Barton 1989, p. 1):

User-owner
a. The member does not buy any shares; ownership is basically collective.
b. Small amounts of retained patronage refunds are the only allocated capital.
c. The members are liable for the debts of the society, though limited so.
d. The equity ratio is low (may even be below 15%).
e. The net fortune of the societies is small.

User-control
f. The principal of equal voting power is adhered to, except for when appointing top representatives.
g. The votes are weighted according to the production volume of the regions.
h. The directors hand over the management of the enterprise to the CEO, i.e., the CEO has extend power.

User-benefit
i. Total delivery obligation that is also upheld strictly
j. International market prices are used to be implemented immediately upon changes.
k. Strict separation between the co-operative society and the co-operative enterprise.
l. New co-operative firms are being established frequently.
m. Intense competition between the co-operatives on the product markets.
n. Intense competition on the market for raw product (members).

Except for these characteristics, one could also add the institutional conditions under which the Danish agricultural co-operatives are working: (o) no legislation on co-operatives, (p) taxation according to the net fortune of the co-operative, (q) agriculture is important for the Danish national economy and hence for politicians, and (r) no party political links.

The following two subsections discuss some of the above-mentioned attributes. Space does not allow a discussion of the complete list.

3.3. The logic behind the Danish model – efficient production

As stated in the preceding section, the traditional co-operative organisational model itself could not explain why the Danish agricultural co-operatives have been so successful on the international markets. So, in this section an attempt is made to use the above-mentioned attributes to understand the logic behind the Danish model.

It may be true that traditional co-operatives have their competitive advantage in low cost and low price strategy, but this does not say anything about the choice of market. The Danish agriculture has aimed for a *high quality market,* which is understandable from the country's European location. Hence, the goal is to be the best supplier of high quality products, earning money through running the operations in a larger scale than any competitor on the high quality market. By the term quality is meant not only the taste and texture of the products but also softer attributes such at ecological concerns and animal welfare.

The objective can not be reached only by reaping economies of scale in the processing plants. Another prerequisite is that the *farmer-members are able to produce at competitive cost levels* on their farms. This is attained by exposing the farmers to the correct market signals prevailing on the international markets – no social or political considerations are taken but only economic ones. The farmer who can not survive in the competition will have to cease operations unless he is not able to undertake adaptive measures. In order to facilitate such adaptations, a well-organised extension system exists in the country.

The way to expose the members to the international market forces is to set *prices that are directly linked to the price fluctuations on the sales market.* A price change on the market for carcasses on the international markets one week will automatically result in a corresponding price change when buying hogs from the farmers.

Another factor with the effect of exposing the members to international markets is the composition of the capital. *The amount of equity capital and the equity ratio is low,* whereby the borrowed capital becomes correspondingly larger. The low amount of equity capital means the co-operative does not have even the possibility to manipulate the price paid to the farmer. A large amount of equity that does not require payment of returns means that the prices are somewhat distorted, Furthermore, knowing that the co-operative has a large fortune, the members could feel tempted to induce the board to raise the price level above the correct market price.

The probability for this to take place is low in Denmark, as the Danish farmers have for more than a century been selling to the international markets, and the co-operatives have throughout the years treated the farmers as businessmen. If the co-operative treats the members as businessmen, they will behave and think as businessmen, never thinking about *the co-operative in political or social terms.*

To the extent that the members of agricultural co-operatives tend to have sympathy with a specific political party, one may expect that links are established between this party and the co-operative, which may increase the probability that the co-operative acts politically. This is not the case in Denmark. There is no specific farmers' party, and the farmers, often being liberal, tend to spread their votes over several parties.

In many other countries, traditional co-operatives have a propensity to let the organisation serve other purposes that an economic one. Having a social basis, constituted by a number of individuals in the membership, the co-operative society may work as a lobbying organisation for the social interests of the members, various political interests may get a foothold in the organisation. Rural development issues,

social policy, agricultural policy, and many other political spheres may become important for co-operatives. This behaviour is not seen in Denmark.

The dominance of the economic thinking is seen i.a. in the *distinction between the co-operative society and the co-operative enterprise.* The philosophy is that the enterprise is there in order to make money for the members while the society's role is to own the enterprise. This principle is seen also in the relationship between the board and the CEO, viz., that the board does not interfere very much in the day-to-day running of the business. This is the CEO's job. The board's task is to develop the strategies which serve as guidelines for the CEOs. This reduces the risk that political interests influences the doings of the enterprise.

This type of market distortions may also follow if the co-operative is deeply involved in the further processing of the members' raw products. If profits made in the processing activities are paid to the farmers in the form of higher prices for hogs, this price will not correspond to the correct market price for the raw product. The Danish agricultural co-operatives, and especially the slaughterhouse co-operatives, have *little further processing,* in comparison to co-operatives in some other countries.

The fact that the farmers are fully exposed to the international markets lead to a *continuous process of structural rationalisation.* As the farmers for years and years face correct price signals from the international markets they have strong incentives to became as efficient as possible at their farms, otherwise they will not survive the international competition. Linked to this is that the Danish farming population is characterised by *a high degree of homogeneity* in respects that are of importance to their production. This homogeneity is a consequence of the many years of international market exposure and the consequence of it is stronger competitiveness on these markets.

Over the decades there has been intense *competition for raw produce* between the co-operatives, each processing firm wanting to operate at the largest possible scale. This process has led to a number of mergers, typically where the co-operative that is loosing in the competition has been taken over by the winning one. Finally, this process has now lead to an almost-monopsony state in the meat industry (and the dairy industry), so the degree of domestic competition for raw products is now only limited. The competition on the product markets are, though, still just as intensive, or perhaps even more so due to the increasing competition on the international markets.

The domestic rivalry for supplies meant that the farmers were fairly prone to change co-operative if the prices of a competing co-operative was better than their own co-operative. The price level for hogs was undoubtedly the most important criterion for the farmers' choice of co-operative, also because the meat co-operatives have had a national pricing system that facilitated price comparisons.

The relative ease whereby the farmers could switch from one co-operative to another, depending on the prices offered, meant that it became extremely important for the co-operatives to be the best one. Member loyalty could one be achieved by economic means, and so the co-operatives were forced to be *extremely business oriented and efficient.*

The business orientation of Danish agricultural co-operatives may seem surprising when combined with the fact that the principle of equal voting is strongly supported by Danish farmer, even among the large farmers. Democracy is an important value.

According to experience from other countries this governance principle may sometimes lead to inoptimal outcomes, e.g., that the majority of small farmers forces the board to act in favour of smaller farmers as against larger farmers. Equal voting power may foster political and social action within the co-operative. The Danish way of handling this issue is that the democratic voting applies when appointing representatives to the regional bodies, while there is a weighting when the regional bodies vote for directors to the board. Regions with a large volume of production have more votes than regions with smaller production. In this way, the boards are representative in terms of production, not producers as is the case when the voting power is equal in both stages. The consequence is that the Danish directors tend to be large farmers who are business oriented and well educated.

Another explanation to the strong position of the principle of equal voting power is the fact that there is *no legislation on co-operatives* in Denmark. The co-operatives are very eager to preserve this as it gives them a freedom to adapt quickly to changes in the business environment, not having to lobby among in the parliament and wait for legal amendments that often are conducted some years after the need for them arises.

One way whereby the Danish co-operatives could argue for no legislation is by belonging to the International Co-operative Alliance, pointing at the set of international co-operative principles that the ICA has decided upon and adhering to these principles. One of those principles is equal voting power. Most Danish politicians consider the ICA co-operative principles to be as good a set of rules as a national legislation on co-operatives.

3.4. The logic behind the Danish model – effective governance

While the preceding section indicates the existence of good conditions for efficient production in the Danish agricultural co-operatives, another issue is whether the members are able to control the co-operatives effectively. This question may be very relevant because of the strong elements of collectivism in the financing and governance structures, which may be expected to give rise to serious property rights and agency problems.

The property rights problems increase to the extent the membership is heterogeneous. The preceding section stated that Danish memberships tend to be fairly homogeneous in respects of relevance to the co-operative business, being an effect of the long period of exposure to the international market forces. Another factor, indicating homogeneity, is that the business activities are extremely focused. Danish agricultural co-operatives are really single-purpose co-operatives, compared to most other countries. For example, the hogs and cattle operations are strictly separated, and there are hogs of a few breeds only.

The homogeneity in the membership is further enhanced by the pricing system, implying price differentiation on the basis of the demand. This has the effect of stream-lining the production of the farmers, i.e., products that do not correspond well to the standards are badly paid and hence the farmers do not produce them.

Co-operatives with business operations far ahead in the value chain tend to face *portfolio problems,* as not all members have an interest in all investments. The more heterogeneous the membership is in terms of risk preferences, the greater becomes the portfolio problem. In the Danish case, this problem is due to be small. Both the memberships' relative homogeneity as well as the limited degree of vertical integration mean that investments will be more or less in the interests of all members.

The small net fortunes of the co-operatives, or the low equity ratios may immediately seem to be drawbacks, but these factors are advantageous when it comes to the solution of the property rights problems. As the investments are limited, and basically have the character of reinvestments, there is no *horizon problem* at all, i.e., all members pay for the benefits they enjoy. Likewise, no member will be able to reap any benefits on the expense of the other members, i.e., the *free-rider problem* too gets an effective solution.

Concerning the *free-rider problem,* also the strict business relations between the members and the co-operative should be mentioned. The costs that a farmer induces are covered by himself due to price differentiation systems.

The low degree of vertical integration has also a beneficial effect on the *control problem* as well as the *decision-maker problem.* The business operations are so simple and straightforward that the individual framers can have a good understanding of them. The difficulties he faces are the international operations, such as export channels to overseas markets.

The *control problem* is also solved by the fact that the farmers are extremely dependent upon the co-operative, and this is so in several respects. First, the co-operative is his only channel to the market, especially as the degree of industry concentration is now extremely high. The farmer senses that without the co-operative, he would be in a poor position. Second, this dependence is the greater as the Danish farmers tend to be heavily indebted, having invested large amounts on their farms in order to be internationally competitive. Third, the liability that the farmers have for the co-operatives debts adds further to the farmers' economic dependence of the co-operative. Fourth, the strict delivery obligations makes it still more difficult for the farmer to find another buyer of his raw products.

The conclusion of this section is that the Danish agricultural co-operatives seem to have succeed in adapting the traditional co-operative organisational model to be next to perfectly suited for efficient business on the large international markets for raw products. But will this co-operative model stand the test when the markets are becoming more and more liberal, the processing industries become increasingly global, the retail chains are becoming multinational, etc.? That is the topic for the following section.

4. Novel co-operative organisational models

4.1. The multiple string co-operative model

While the preceding section explained how the characteristics of the traditional co-operatives model, as applied until recently in Denmark, have fostered a highly competitive co-operative sector in the agriculture, this section continues with the multiple string co-operative model. This model is a natural continuation of the Danish Model, the difference being that the co-operatives have now become so large and the market conditions are getting increasingly diversified. These factors have created a heterogeneity in both the membership composition and the production and marketing operations, and so, there is a need to create higher degrees of homogeneity. This corresponds to a kind of "market segmentation" of the membership and hence, of the business operations.

The characteristics of the multiple string co-operative model (see Table 3) do not violate the characteristics of the traditional Danish model, as explained in section 3. The latter attributes are equally valid for the multiple string concept. Within each "string" (differentiated product category), the traditional Danish model is applied.

It is evident that the production volume of multi-pigs is reduced when Danish Crown embarks on new breeds of pigs, and hence, some economies of scale may be lost. These losses are, however, possible to bear – first, the production of multi-pigs is still so large that the average costs are reasonably low, and this is especially so after the last merger, and second, the new breeds mean such improvements in adaptation to some specific market demands that the profitability is improved. Of course, the number of breeds must, however, be quite limited.

4.2. Co-operative models with external investors

The competitive pressure seems to increase continuously. For Danish Crown and the other Danish slaughterhouse co-operatives, working on the world market, the present changes in the US pig production system poses a threat – new production systems make extreme low cost production possible (Lidén 1999). The present WTO negotiation round may have had problems in its opening session in Seattle, but no observer doubts that a further liberalisation of the world trade is to be expected, and this affects also the meat industry. The consumers' consumption pattern as well as buying pattern creates increasing challenges to the producers. The retail trade is about to become a multinational business, or even a global one, and hence, the producers will face more and more concentrated purchasing power. All in all, the price levels can be expected to fall in the meat industry.

How are the Danish slaughterhouse co-operatives prepared to meat these challenges? Will the traditional Danish agricultural co-operative model be instrumental also in the future? Could the multiple string co-operative model, supplementing the traditional model, be extended to include a larger number of product classes?

It seems that it is difficult to develop the traditional Danish co-operative model even further towards creating more competitiveness in the agricultural sector. The development of the multiple string co-operative model is a marked improvement of the traditional model, and there might be still some refinements of this. The introduction of a larger number of product classes, "strings", in order to attain better market adaptation and thereby a higher price level, is, however, doubtful. This may result in the loss of certain scale effects as each product class would become smaller.

The overall strategy in order to increase the revenues of the co-operatives and the farmers must then be "value-added". The products produced must have a greater value such that the customers are willing to pay a higher price and the price increase must be larger than the adjacent cost increases. There are two main avenues for adding more value to the products, and if these are combined, the effects are due to become extra strong.

One way is to stimulate the farmers to raise the quality of the products on their farms. Again, quality must be understood not only physically but also the variety of soft variables should be included – ecology, animal welfare, image, ... Hence, the products are profiled in relation to those of the competitors, and the Danish meat sector could strengthen its grip of the most lucrative markets. Such a *quality meat strategy* requires that the co-operative puts higher standards for the farmers, gets stronger involved in monitoring the members' production, and amends it pricing policy. Hence, the degree of vertical integration in the member/co-operative intersection is strengthened.

The other option is that the slaughterhouse co-operatives engage in more processing of the meat, so that an increasing share of the farmers' pigs are sold as value-added products. Given its dominating size, Danish Crown has better opportunities to do so than Steff-Houlberg and Tican have. Such a strategy implies that the co-operative gets a stronger market position on the markets for consumption-ready products which are often less price sensitive. In such a *processing strategy* the co-operative tries to avoid the most intense price competition on the bulk markets. This strategy implies that the vertical integration is extended to comprise a larger number of stages of the total value chain.

If Danish Crown is to pursue one of these two new strategies, or both of them, it is probable that large investments are required – especially so for the second one. As the equity ratio of the co-operative is remarkably low, this implies that external capital may be necessary. External capital would, however, not be possible in the primary co-operative as then, the traditional co-operative model would disappear and together with that also the co-operatives ability to produce at low costs would be seriously threatened. Rather, external capital would be invited in a number of subsidiaries, owned jointly by the co-operative and outside financiers.

When talking about external investors, also the farmer-members function as external capital sources if they are to make individual investments in a subsidiary of the co-operative. They do not do so in their supplier role but rather take an investor role.

When considering whether the co-owners of a co-operative's subsidiary should be fully external investors or members as investors, a host of factors must be taken into

consideration. One is the amount of capital needed; in case a large amount is required, the farmers are probably not able to finance the entire investment. Another one is the type of business operation: if it to a large extent involves raw products of a specific quality, there is stronger arguments to attract members as investors, while external financiers may be more appropriate when the operations concern standard quality raw products.

At present, it is not known whether the "bylaw committee" of Danish Crown is contemplating any changes in the co-operative model, so the above-mentioned is only the authors' own speculations. While maintaining the traditional co-operative model in the present multiple string version, it may be possible to raise the profitability of the Danish Crown members by establishing a few subsidiaries together with a group of farmer-members or with some external investors in order to expand the operations vertically in the value chain, possibly with the help of raw products of a higher quality. Such an organisational set-up means that the co-operative includes a radically different co-operative model for the new operations (c.f. Nilsson 1999).

5. Conclusions

The success that Danish agriculture has had and has on the world markets is closely related to the fact that the Danish agricultural co-operatives are organised according to a specifically Danish variant of the so-called traditional co-operative model. There are strong theoretical support for this assertion and also empirical observations are supportive. The Danish model implies large scale production in all stages of the value chain, combined with truly market-oriented operations through the entire chain. The farmers get exposed to the market forces that the co-operatives face when selling the produce to their buyers world-wide. Likewise the transaction costs in the dealings between the farmers and the co-operative are reduced to a minimum.

As the markets become more and more diverse and turbulent, it has been difficult for the co-operatives to maintain the high degree of homogeneity as concerns products and production. The response to that is the development of a variant of the traditional co-operative model, labelled the multiple string model. The operations of the co-operative are divided into a small number of "strings", each dealing with a specific type of product, be it different animals slaughtered or different breeds of pigs. Thereby better market adaptation is attained, while the co-operative and the farmers still operate at largest possible scale and thereby reduce the cost level.

As the price squeeze may be expected to continue, it is possible that still other co-operative models are developed and implemented. Most probably, the co-operatives will try to add more value to the products so as to get higher prices. There are two main ways of get more value added products – and the combination of these two seem especially promising. One is to go still further in developing high quality products, whereby quality is not only attributes of relevance for the consumption itself, but also ecological concerns and animal welfare. The other road is to process a still larger share of the products, into consumption-ready products. The second alternative implies, however, large investments, and so, there may be arguments to have this

processing conducted in subsidiaries with external investors as co-owners. These external investors could be industrialists or they could be farmers in an investor role as opposed to the present supplier role. Which is to be preferred should depend on what type of expertise is needed in the various subsidiaries.

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