

Competitive Patterns in the Danish Organic Industry & its Usefulness in Predicting Development in other EU Markets¹

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Abstract. The organic market in Denmark is not a niche market any longer as it was in the late 1980s. The development has followed the typical pattern for diffusion of innovations and by 2002 the market supply seemed to have surpassed the equilibrium supply by around 30% and a potential adjustment is ahead.

During the period 1987-2002 the development in the organic industry has undergone dramatic changes. In the beginning many small new businesses dominated the area. Presently, there is a remarkable concentration of cooperative monopolies and oligopolies from the conventional industry dominating the industry.

In general, Denmark can be regarded as a frontrunner in organic development. Therefore, important clues concerning the development in other EU countries can be found, and the following points are analysed to evaluate if similar developments can be expected. Can the Danish diffusion path for organic development be expected in other countries? Will the supply in other EU markets also surpass market equilibrium? Are the Danish experiences with respect to policy choices and power-play of dominant players in processing and distribution industry of general relevance? Are the maturity gains observed in the Danish organic industry potential in other markets? Is increased international trade beneficial?

Keywords: Organic Industry, Industry Concentration, Surpassing Market Equilibrium, Imperfect Markets for Organic Products, Dominant Players, Maturity Gains.

1. Organics in Denmark from 1987 to 2002

With the foundation of the Danish Association of Organic Agriculture, the Danish organic movement was organised in 1981. The movement, which consisted of farmers, consumers and processors, established a list of guidelines for organic farming in Denmark. In the initial period of organic farming, demand was supply-driven and the organic scene attracted pioneers amongst farmers and consumers.

From the late 1980s, organic products became a more visible element in food production and consumption. An important factor in this development was the introduction of the first Act on Organic Farming in 1987, which supplied the legal foundation for the organic standards and the necessary administrative basis for controlling the system. This act also formed the basis for the introduction of the state controlled logo, which can be used on domestically produced organic products (from state-authorized farms) and on foreign produced products on which the last economic activity is performed in Denmark. In 1993, the largest supermarket chain in Denmark (FDB) at the time introduced a strategic promotion of organic products. The impact on the market was huge, and contributed to making the market and the future development demand-driven. A number of food and environmental scandals damaging the trust in conventional food products could also be seen to have contributed to the expansion of the organic market.

Since the late 1990s, both the number of farms and the area under organic management have increased progressively. With 950 farms, the number of converting farms peaked in 1999. As figure 1 illustrates, the net conversion percentage continues to decrease after 1999^[13].

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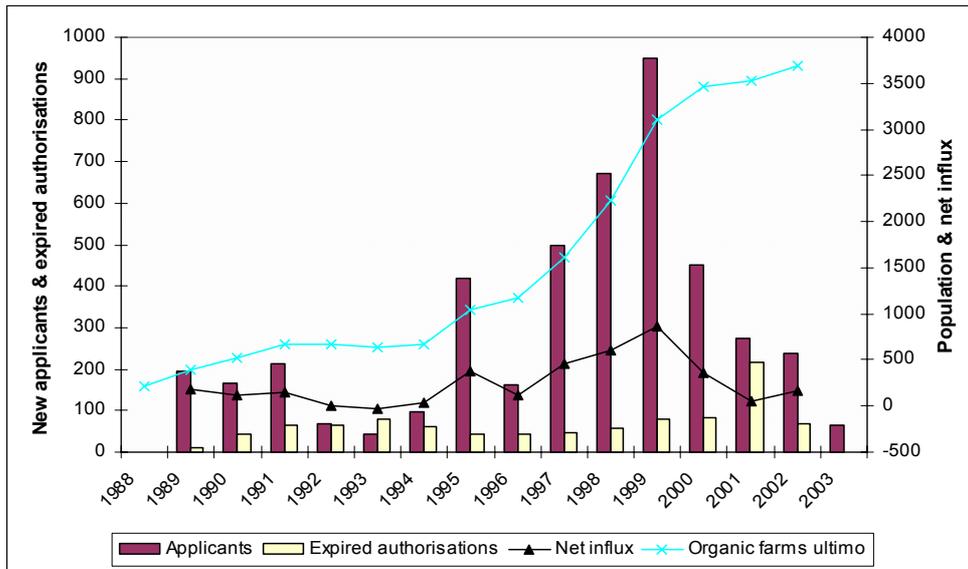


Figure 1: Development in converting farms in Denmark ^{[12][13]}

In 2002, the number of organic farms corresponds to about 6.5% of the total number of farms. The 183,264 ha of organic production area also correspond to more than 6.5% of the total agricultural production area in Denmark. Due to a surplus supply of organic products (e.g. milk and eggs) and drastically falling prices (e.g. 50% for wheat and barley) in 2002, the decline in the net conversion percentage can be expected to continue. Given the present market conditions², it seems that Danish organic farming has reached its peak, a belief confirmed by stakeholders in the market⁷.

The development of organic farming in Denmark from 1987 to 2002 seems to follow a typical diffusion of innovation curve. Although organic farming is not a typical innovation³, Padel^[10] still confirms that the 'adoption/diffusion model' can be applied to the diffusion of organic farming. The diffusion of organic farming is characterised by a slow start in the 1980s followed by a peak influx in 1999 and a levelling of the number of organic farms in 2002/2003. Following the typical innovation diffusion generalisation, the converters in the last period of the diffusion process are called *late adopters* or *laggards* and share certain characteristics^[14]. The laggards can be characterised as being non-venturesome, risk adverse, sceptical, tradition-bound, using personalised and fewer sources of information compared to earlier adopters in the diffusion process.

In Denmark, the short-run economic conditions for organic farmers have been generally favourable from the mid 90s up until 2001, and earnings have even periodically surpassed those of conventional farmers. In the longer perspective, the risk facing organic farmers can be considered higher than the risk facing conventional farmers. This is the case because organic farmers are under obligation to remain organic for a five-year binding period, which prevents them from leaving organic farming if conditions become unfavourable, unless they return the subsidies received. In Denmark, the organic markets are small, which is illustrated by the size of organic farming land occupying approximately 6.5% of all farming land. Based on unofficial sources an estimate of the market shares for organic products reveals a great variance between product groups and shows that organic products are important in areas such as milk, carrots, eggs, oatmeal and rye flour and small in areas such as cheese, pork and beef meat, see table 1.

Product	Market share percentage
Milk	23,5
Hard cheese	1,7

² Examples of conditions: market structure, consumer demand, legal framework for production and promotion of organic produce.

³ Padel^[11] presents several problems associated with characterising organic farming as an innovation although these do not result in a rejection of the model. Hence, according to the model, easily adoptable innovations have obvious advantages, involve little or no risk and allow for experiments on parts of the farm. Which is not found to characterise organic farming.

Butter	4,3
Carrots	12,8
Potatoes	3,2
Beef	0,9
Pork	0,4
Egg	16,8
Oatmeal	27,2
Rye flour *	22-23
Coffee	3,5
Fresh pasta	8,0
Wheat flour	8,2
Curdled milk	5,4
Rye bread	5,0
Frozen vegetables	0,8

Table 1: Market shares for organic products in Denmark 2002^[15*] [9]

Organic markets do not figure in official trade statistics, and the possibilities on export markets are to a large extent unknown. Furthermore, export markets are difficult to handle due to differences in organic standards between countries⁴ Consumers' motivation for buying organic products is to a great extent characterised by environmental and animal-welfare concerns rather than by more egoistic motives or concerns about functional product qualities. These motivations might depend on what is on the actual political-social agenda, and be open to sudden changes to a much higher degree than the actual functional food qualities. Additionally, organic products generally have a high degree of price sensitivity^[17], which potentially contributes to making markets less stable.

During the period from 1987 to 2002, the character of organic products has changed. Organic products have developed an ever-increasing similarity with conventional products with regards to matters such as packaging, assortment, variety etc. Production processes and production control have shifted to a few conventional processing companies (oligopolies or monopolies in most product sectors) as opposed to the earlier phases, when many new pioneering companies were in control. Distribution processes have shifted from small traders to a situation where few supermarket chains (oligopoly with two main actors) distribute about 75% of all organic products.

2. Understanding the market(s)

Based on this general overview of the development in the Danish organic market, we know proceed to establish an understanding of the organic markets. Seven fundamental issues have been identified and these will form the basis of the remaining part of the article and be discussed with respect to the possibility of using the Danish experience in other EU markets. The following two issues relate to farm industry:

1. The diffusion /adoption process in organic markets.
2. The market equilibrium & the market process i.e. over- & undershooting the market equilibrium due to in & out lags in the organic market regulation.

The following three issues relate to processing and distribution:

3. The policy choice of dominant players.
4. The power play among dominant players.
5. Maturity gains from increased scale & scope.

And finally one issue relates to international trade:

⁴ Due to the state-controlled label, most organic labels from abroad are accepted in Denmark. However, this is not the case with the organic label in other countries with private control organisations.

6. International trade & welfare loss/gain.

The choice of issues is eclectic and based on the Danish experience. The discussion of points 2, 3 and 7 are of special relevance for political bodies setting the rules for organic production and trade in organic products. Given the advanced state of development of the organic industry in Denmark the discussion of points 4 to 7 is of special relevance to EU markets still in the early development.

Ad. 1 The diffusion /adoption process in organic markets.

The broad picture of conversion has been illustrated in figure 1. The numbers illustrate that the development follows a logistic curve with 1999 as the inflexion point. With 950 converters in 1999, the number of new applicants reaches a peak. In 1998 the number was 670 compared to 499 in 1997. In 2000, there were 450 new applicants and since then the number has declined. In 2001, the number of converted farms and land reaches a level of 6.5% of the total number of farms and arable land in Denmark. Parallel to this development, a number of farms have ceased their authorisations. Up until 1997, less than 50 farms failed to renew their authorisation each year, and after 1998 the number increased to around 80 farms per year.

Earlier empirical analysis shows us a narrow picture of the farmers' situation prior to conversion to organic farming. Hence, based on our 2002 case study^[16] of potential converters we found that these laggards, i.e. the late converters in the diffusions process of organic farming are not heavy believers in environmental and animal welfare dimensions of organic farming, but are more motivated by financial considerations. Based on historical data, the three-year budgets for conversion demonstrate that converting would improve Family Farm Income (FFI). The motives of the laggards are very different from the motivational set-up amongst the pioneers and early adopters. The pioneers and early adopters converted with the prospect of an uncertain financial situation and a conviction that environmental and animal-welfare benefits were important goals. Consequently, we see a change in motivation over time. We do not have hard data to make exact projections of when the shift in motives takes place, but it could be assumed that a major shift in the balance between the two types of motives takes place in the mid or late 1990s. The motivational balance is important in order to understand the future development in organic farming. Farmers who are mainly motivated by heavy environmental and animal-welfare considerations can be expected to have a higher tendency to remain organic compared to farmers who have mainly converted for financial reasons, if the economic conditions for organic farming deteriorate.

AD. 2 The market equilibrium and the market process.

The broad picture of the development in the past 15 years presented in section 1 and the narrower picture of the shift in motives presented above allow us to illustrate the expected development in Danish organic farming.

As of now, organic export is of minor importance and can be expected to stay so for many years to come allowing us to regard organic farming as a national affair. We will build the projection of the future development around a projection of demand and supply in the Danish market for organic farms or organic farmed land. Supply and demand are measured in per cent of the total number of farms or farmed land.

In 2002, the supply of organic products was around 6.5% of all farmland. This supply made prices of organic produce drop drastically - around 50%. So at this level, supply clearly exceeds the present demand in the market. In order to estimate the actual demand level in the market one possibility is to analyse the pattern of supply and demand before 2002. In 1999, the net influx of new organic farmers was 871 or a 40% increase in the number of organic farmers. These farmers introduce their products to the organic market in 2001. Due to the lack of transparency in the market and the fact that the market up until 2001 has been undersupplied, we do not see the effect on prices before 2002. The surplus supply in 2002 is also influenced by the net influx of farmers from 2001 i.e. 367. The net number of farmers converting in 1999 and 2000 is 1,238, which corresponds to approximately 33% of the total number of organic farms in 2001-2002. If these farms were removed, the organic supply would correspond to 4.1% of the total number of farms. This level or about 4.5% would probably correspond to the equilibrium level between supply and demand in the Danish organic market. The estimated market equilibrium and the 2002 situation in the organic market are shown in figure 3.

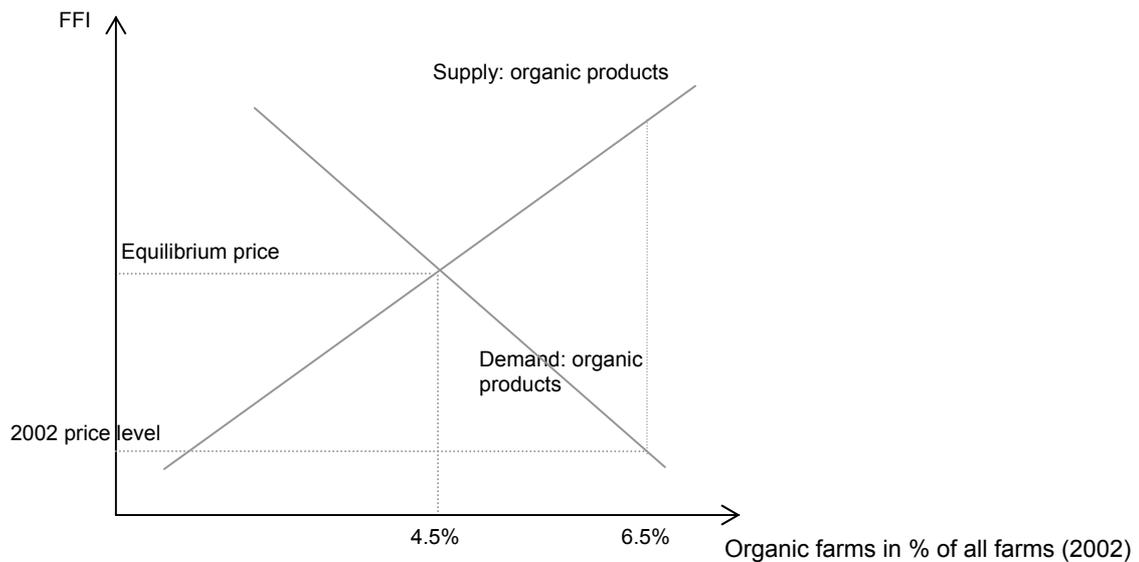


Figure 3: Market equilibrium & 2002 situation in the Danish organic market

FFI is used as a proxy for prices of organic products, and organic farms in percentage of all farms is used as a proxy for the amount of organic products supplied.

Given the assumptions in figure 3, it must be expected that a number of organic farmers will leave the organic area and return to conventional farming. In order to understand the mechanisms, we have to look at the conditions for entering and leaving the organic market. From the time of application for organic status until production reaches the market with fully organic status, there is a general time lag of around two years (the in-conversion period). After achieving authorisation as an organic producer, the farmer receives subsidies for converting and remaining organic. To obtain these subsidies the farm has to remain organic for a contractual period of five years. After these five years, the contract can be renewed for another five-year period. If the farmer wishes to terminate the contract, he has to return the subsidies received during the binding period. More than anything, the pattern of payment in the first five-year periods makes it highly unlikely that the farms will break the contract. In practice, this means that there is a five-year lag between start of conversion and the possibility of leaving the market. In the present situation, this means that the 670 farmers who converted in 1998 can reconvert to conventional status in 2002 by not renewing their contracts. 950 farmers from 1999 can reconvert in 2003, while the 450 farmers from 2000 can reconvert in 2004 and so forth.

Given the results from the case studies concerning the motives for entering into an organic production, organic values vs. financial values could be involved in the different adopter categories, and it is generally assumed that farms which converted before 1996 will stay organic, while later converters with more prominent financial motives will return to conventional farming, if the economic incentives continue to deteriorate.

In order to bring the 2002 market back to equilibrium, around 30% of the organic farmers in 2002, i.e. approximately 1,000, have to leave the organic market. As of now, there is no experience with converting back to conventional farming. The level of farms with expired authorisations which have not renewed their authorisation has been low and stable, and can most probably be attributed to a number of reasons. The total number of converters from 1998-2000 is 2,000 farms. They can reconvert in 2002-2004. The market should reach the assumed equilibrium of 4.5%, if 50% or less reconvert to conventional farming. If less than 50% reconvert, the market will stay oversupplied with low prices for a longer period, and if more than 50% reconvert, the market will be undersupplied and prices will increase. This will create a new influx of converters. Due to the two-year lag in supply of the market (in-lag) and the lag of five years for leaving the market (out-lag), it is difficult to foresee the development in the size of organic farming if the re-conversion rate is larger than 50%.

Due to the two-year in-lag and five-year out-lag, the market transparency is low, which points to a risky market. The interaction between supply and demand in such a market can result in a situation where the market never stabilises, but continues to fluctuate. Under certain demand and supply conditions, the market might never converge to equilibrium, but rather undergo an explosive development. The tool used to analyse these kinds of markets are known as *cobweb models*^[8]. Empirical research has shown the existence of these conditions in certain agricultural markets – like potatoes^[11]. These markets are simpler than organic markets due to only one-year lag between production decisions and marketing, and hence they seem to produce regular fluctuations in prices and quantities.

The situation in the Danish organic market can result in different fluctuation patterns. The most likely development, based on the assumption that the demand is more elastic than supply and that the farmers form their expectations on more than one year of experience with low prices, is that we will see damped fluctuations in the market approaching the equilibrium, however, only time can show the actual development.

Naturally, the estimated equilibrium point in the market at 4.5% of all farms is a rough estimate based on the situation in 2002 and its historical roots. The equilibrium may change due to interventions in the market. Supply-side measures such as increased subsidies and demand-side measures such as increased marketing effort and/or development in substitute markets such as increased export or an improved situation against competitive conventional products may increase the equilibrium amount of organic production. The basic functioning of the organic market will remain fluctuating after 2002 due to the inherent lags and uncertainty of the information. Combined these two market features make rational formation of expectations difficult, hence it is complicated for the actors on the market to form rational and experience-based expectations of the future market situation. Supply surpassing demand around the equilibrium level of the market is followed by the fact that it is hard to foresee fluctuations in supply and prices in the long run. This development will not be parallel in time on the different markets due to differences in market situations. The development in the Danish organic market and its causes should be communicated to the other EU countries in order to help market actors form rational expectations about the potential development.

AD.3 The policy choice of dominant players in organic markets.

The Danish organic industry and distribution in the latter phases of development are dominated by oligopolies or nearby monopolies. Milk, meat and eggs are good examples. This results in a situation where markets can no longer be characterised as free competition markets with a lot of suppliers and customers and free competition formation of prices and quantities. On the contrary, markets are dominated by big payers with market power that are able to set prices and quantities exercising power. This goes for the supply side as mentioned, but is also the case for the retail sector where two supermarket chains together have a considerable market share. The confrontation of dominating units both on the demand and the supply side gives rise to a situation where these units also can exercise market power and create situations with administered prices and quantities. A situation where observed prices and quantities cannot be interpreted as signals from a free market, but have to be interpreted as political signals on the attitudes toward organics from the involved parties. In the following we will take a closer look at the possible behaviour of conventional producer co-ops as they are important players on the supply side of the Danish organic market.

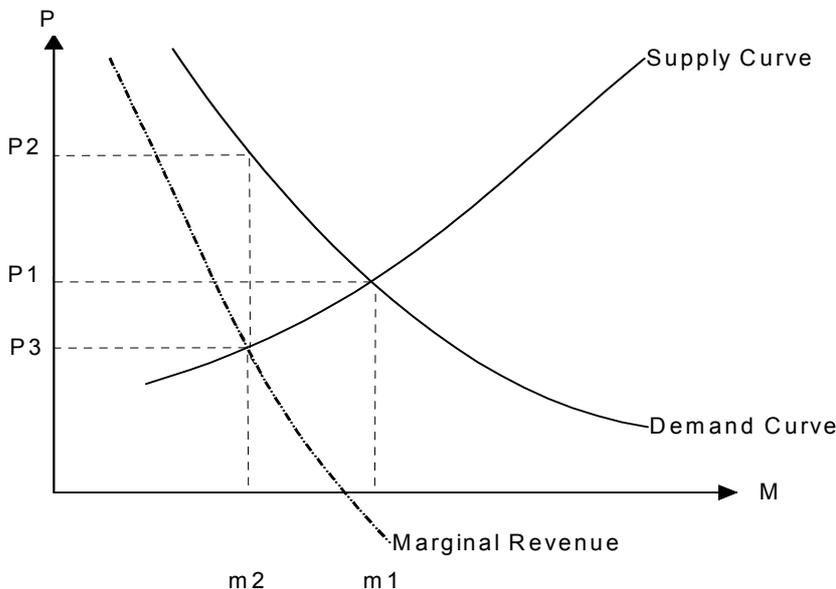
It can be argued that the established non-organic food producers – mostly co-ops – had an interest in defending their market positions both in consumer and supply markets. If they succeed in establishing a monopolistic situation in the organic markets as they have, they could have considerable influence on the organic market development. The political choice of price and quantity for a given product group, such as milk, meat or egg, is illustrated in figure 2. Fundamentally, the co-op monopolist can choose between three policy models for its organic products.

- Model 1 – free competition: The market has the supply m_1 and the price p_1 . The control of supply will be through the price p_1 . There is no profit for the co-op to cover indirect cost, risk, image effects, etc.
- Model 2 and 3 are characterised by oligopolistic pricing behaviour. The supply is lowered to m_2 and consumer prices are increased to p_2 . These policies put a break on the development of the organic market and a welfare loss of m_2 - m_3 . Due to close substitutes in the non-organic market the quantity effects can be fairly large.

The difference between model 2 and 3 lies in the choice of control mechanisms on the supply side. In model 2 prices to suppliers are set at p_3 corresponding to the supply m_2 . The profit: $m_2 \cdot (p_2 - p_3)$, goes to the general profit in the co-op and is spread among all co-op members. In model 3 the organic producers get the price p_3 and a quota system has to be introduced in order to limit the supply to m_2 . Quotas can either be given to organic farmers – to whom the extra profit goes – or sold to organic farmers with all members, organic and conventional, sharing the revenue.

All three models increase the internal negotiation cost within the co-op due to the heterogeneity of interests between organic and non-organic farmers. The exact forms of control can differ, hence prices, cost elements and quality standards can be included in the final algebra. The three models show the political choices for management and board of the co-ops. It is an empirical question to detect the actual choice. The concrete forms of policy are dependent on the information policy of the co-op against its members going from full information disclosure to situations where management and board decisions are closely held secrets. If the board/management takes decisions in concealment, the debate with the suppliers/owners can die due to lack of information.

Given the actual political constellation within the owner structure of coops – with non-organic farmers as the dominating group – behaviour according to model 3 seems most likely.



Supply curve = marginal cost curve

- Model 1 = p_1, m_1
- Model 2 = p_2, m_2 , producer price p_3
- Model 3 = p_2, m_2 , producer price p_2 and quotas

Figure 2: Oligopoly pricing for organic products by producer coops

The core element of the Danish situation is the existence of monopolies or oligopolies in the organic markets. If this situation holds in other EU markets prices and quantities cannot be interpreted as market signals but have to be understood as administered signals depending on the motives and attitudes of the actors in the production and distribution sector. Given the fact that product cost for food products normally splits between farmers and the subsequent members of the distribution and processing system with 1/3 to the farmers and 2/3 to the other members the significance of these actors can be considerable for the market development. This situation is elaborated in the following section.

AD. 4 The power play among dominant players.

The organic industry initially started by farmers converting to organic production. They took the risk of converting their production in anticipation of being able to sell their products. They could choose three approaches to selling their products: establish their own transformation and transaction system, establish a contract with other actors in a transformation-transaction system sharing the benefits and risk for a longer or shorter period, or rely on a development of a market, i.e. a sufficient number of buyers and sellers to establish a stable market which allows them to sell their products.

The potential owners of transformation and transaction systems could be established enterprises. They will engage in the organic market to the extent that their transformation and transaction system are compatible to the organic system. Potential new owner groupings could be found among farmers who could see a potential in establishing a system to protect their market access and lower transaction cost. The same could be the case for consumer groups. New entrepreneurs could be attracted to the area and specialize in small-scale systems.

The Danish experience is that in the latter stages of development the organic market is heavily influenced by oligopolistic structures from the conventional food industry. The players in the area are not a homogenous population with an expected normal adoption and diffusion process. On the contrary, one might expect a development where individual large players can form the development of the organic industry with politically dominated decisions. Two main motives – getting a part of the organic market or limiting competition from the organic market - and two main types of behaviour – proactive or reactive - could be hypothesised for the large players. This situation is shown in table 3.

Motives	Behaviour	
	Proactive	Reactive
Offensive: getting part of the organic market	Potential for increasing the organic market based on positive evaluation of the potential	Potential for capturing part of the organic market if it competes with existing business in undesirable ways
Defensive: trying to limit competition from the organic market	Blocking moves against competitors in anticipation of undesirable expected competition	Blocking moves against existing competition

Table 3: The outcome of large players' motives and behaviour

The Danish market has been heavily influenced by the 1993 decision by *FDB* (cooperative retail chain) to promote the organic development based on a positive evaluation of its potential: This example shows proactive behaviour and offensive motives. The influence of the dominating dairy *Arla* has also been considerable: This example shows reactive behaviour and defensive motives.

Given the power of the large players in distribution and production, they have the capacity to promote or hinder the development of the organic market. The actual behaviour is hard to foresee and has to be evaluated in each individual situation. Hypothetically, the four potential outcomes could show up at any point in time along with the development of an organic market and changes in the competitive situation. The Danish experience is extremely relevant to other EU markets, where oligopolistic structures exist and dominating companies have a heavy influence. These companies can influence the organic industry due to their power by either promoting or hindering its development. Analysing the behaviour and motives of these actors are necessary in order to understand the development of organic markets and interpret data from these markets. As an example let us take the role of transnational retail chains. In the early phases of organic markets where the volume is small they tend to ignore the small niche market. If the niche market grows in several of the countries where it is represented it might be forced to act in the organic market e.g. by setting up translational useful buying policies. These might be supported by considerable buying power and used to promote own organic labels and spreading production under these labels to a multitude of new geographical destinations - say vegetables from Latin American and beef from Argentine. This development pattern would be quite different from the historical development patterns in Denmark and most other EU countries.

AD. 5 Maturity gains – the rationalisation process in organic farming, production & distribution.

In the preceding section the development in the size of the organic sector over time and the potential behaviour of dominant players with respect to pricing and quantity decisions. Another important aspect in explaining the functioning of organic markets is the development in the character of the organic system and the associated cost of running the organic farming, processing and distribution system. Over time, the Danish organic system has developed from an emergent industry position or a market niche situation to a position with scale and scope in operations similar to conventional food industry and broad market coverage (cf. table 2). During this development the character of the organic food system changes. The changes do not necessarily follow a uniform pattern in all parts of the organic industry – it varies with the developments in demand going from uncertain situations to more certain situations, the competitive pressure on the conventional sector and the policy choices of dominant actors within the organic and conventional sector. These policy choices are made in situations where the potential scale and scope of the organic industry change and offer different potential possibilities to establish cost effective behaviour in the different supplements of the organic food system. An empirical investigation of these aspects is not made here, but an analytical approach is presented enabling us to grasp the dimension of the development process and the potential cost aspects. Table 4 gives an overview of a number of important elements in the organic food system, important dimensions within the individual element, possible choices within the dimensions and the potential cost effect of the different choices.

System activity	Important dimensions	Possible choices	Relative cost associated with the choice
Primary production of raw material	Scale of production and joint production	Small scale Optimal scale & scope	High unit cost Low unit cost
Transportation and storage	Size and place	Small scale Optimal scale & scope	High unit cost Low unit cost
Processing	technology	No processing Craft processing Industrial processing	No cost High cost Low cost
Distribution	technology	Direct Special stores Conventional food store	Typical high cost carried by costumers Medium cost Low cost
Service	Readiness for use	Low High	Small unit cost High unit cost
Market position of the product category	Knowledge/confidence	High Low	Small unit cost High unit cost
Market position of the marketer	Knowledge/confidence	High Low	Small unit cost High unit cost

Table 4: Potential elements in organic food systems

The primary factors behind the actual configuration of an organic food system within the elements illustrated in table 3 are scale and scope and the stability of demand. Given actors and potential actors' evaluation of the situation in the food system they make their commitments and try out the potential and consequently the system develops. Two extreme cases may serve to illustrate the potential outcome.

- Case 1: The low demand/low turnover case. In this case the primary production will typically be small scale as will transportation and storage, processing will be handicraft, distribution will be direct or through special stores, knowledge of the product category and the marketer will be low. All these features point to a system with high unit costs for the product units involved.
- Case 2: The high demand/turnover case. Contrary to case 1 this situation results in low product unit cost due to scale and harmony in production, optimal scale and scope in transportation and storage, industrial technology in processing, low cost distribution and low cost marketing due to the established position of the product group and the marketer.

In the real world for given organic products in given markets the actual situation with respect to system elements, their character and cost can be far from the two extreme cases given the particularities of the situation, but none the less the overview presented in table 3 is an important tool to the understanding of the potential organic food systems and their cost structure.

In a situation like the Danish where several product groups have reached the development described as case 2. Their effectiveness and efficiency of the organic system for these products are important elements in promoting and stabilizing the organic market.

It is a fact that organic farming is more expensive per product unit than conventional farming in most cases, but given the fact that farm cost typically only accounts for 1/3 of the product cost this does not necessarily need to have great influence on the prices of the final product. Inefficiencies in other elements of the organic food system can be far more important in creating high cost on organic products.

The more the organic food systems approach case 2, “the low cost case”, the more likely it is to start a self-enforcing movement towards bigger organic markets. Reportedly, the organic markets have high price elasticity^[17] – let us assume it is 2 in a given market. A lowering of the organic system cost (and consequently prices) of e.g. 10% should then result in a demand increase of 20%. By going from a case 1 situation to a case 2 situation cost reductions of this size or more are easily realized even without hampering with farm prices. This effect can be named the maturity gains as it unfolds when the organic industry within a product group moves from being in an emergent situation (case 1) to a mature situation (case 2). The above-mentioned argument for maturity gains based on a simplified theoretical argumentation and the Danish experience in several organic product groups is transferable to other EU markets. The basic core of the argument lies in the fact that the majority of the maturity gains originate from the logistic, processing, distribution and marketing elements of the organic food system. If the market participants are aware of these maturity gains and use this potential they have considerable impact on development of the organic food markets and can moderate the influence of higher farming product cost and increase turnover considerably by making the system more effective and efficient.

AD. 6 International trade in organic products and potential welfare gains/losses.

According to a recent export analysis^[9] the Danish organic export has the following characteristics: In the year 2000 the export amounted to DDK 237m. In 2001 to DDK 291m, and in 2002 to DDK 224 m. The main product areas were dairy (33%), meat (19%), cereals, grocery products, drink products and snacks (48%). 50% of the export are characterized as high value-added niche products. The five biggest exporters account for 50% and the rest is split between some 50 companies. The neighboring countries, i.e. UK, Germany and Sweden are the most important export markets. Compared to export of conventional food products, the organic export is both absolute and relatively insignificant to the number of farms.

The above mentioned report^[9] formulates a policy in which the vision is that development in the organic market should be market driven. The highest priority is given to administrative coordination between the public authorities engaged in facilitating export. Long-term priorities are given to promoting the EU logo and reciprocal certification between relevant countries. Dissemination of market information and promoting Danish companies are other short-run priorities. A closer look at the export policies of the five biggest actors in the export markets could be relevant. This, however, is not possible.

For all practical purposes the Danish organic export is very small and the export policies seem reactive. The Danish import of organic food products is not statistically documented but this seems to be of minor importance except in areas where there are no local production and in seasonal periods.

The inter-EU trade in organic products has recently been analyzed and documented^[5]. Due to lack of statistical sources the analyses are based on expert interviews and 9 countries are covered in a four-year period. The analyses paint a very complex picture of inter-EU trade in organic products and on page 92 it reaches the surprising conclusion in relation to understanding national prices and price premiums that the price differences between countries do not reflect the neo-classical economic theory. This conclusion is probably quite wrong. A more realistic conclusion given the data in the report would be that there is not a common market for organic products in the EU, but several national markets which are not linked to each other in any significant way through trade. A number of very good arguments can be put forward to defend the point of view that the EU consists of several separate unlinked markets such as: different food habits; different production conditions in different areas; different certification regimes are all examples that inhibit trade. Also, many organic operators can be characterized as emergent, small actors without

international experience and power to get that experience. Organic markets are on a very different development stage in different areas. Local actors have local interests and some argue that organic by nature has to be local. Some of the externality gains have to be local. There is a lack of market transparency relating to some of the above discussed market features and the interests of dominant players might differ across local markets.

Obviously, this situation can change when the development in the individual markets approaches a situation where maturity gains arise. If that becomes the case in a given market, new players with more international reach become actors in the market. They will have local market power and international buying power. They can certify Latin American production of fruit and vegetables and South American beef production as organic and will do so if they believe in the local demand in their retail units. They can also be important players in reaching maturity gains across borders.

The traditional arguments for welfare gains through foreign trade can also be used in connection with organic products. The uneven development in the individual EU markets clearly underline the need to opt for these welfare gains as illustrated here by the development in the Danish organic markets where surplus and lack of supplies changes over time and between areas.

3. Implications of the Danish experience for other organic markets in the EU

All organic markets in the EU have seen high growth rates between 1993 and 2000^[5]. In 2000 five countries (Austria, Denmark, Finland, Italy and Sweden) reached a level of more than 6% organic farmland of all farmland. The rest of the EU countries had an organic share of 1% to 3% in 2000^[5]. The equilibrium level for supply and demand in the different countries is unknown. Our main argument regarding the development in Denmark was that the supply has been surpassing the market equilibrium level with 30% due to lack of knowledge of the market equilibrium, in- and out-lags in the market and growth expectations based on historical experience. The Danish experience is applicable to all other EU countries with free access to organic markets, since they all share the same basic features. Lack of knowledge of the market equilibrium, in- and out-lags and heavy growth rates make it difficult for the market actors to form rational and experience-based expectations regarding the future market situation. Supply surpassing demand around the equilibrium level of the market is followed by the fact that it is hard to foresee fluctuations in supply and prices in the long run. This development will not be parallel in time on the different markets due to the different market situation. The development in the Danish organic market and its causes should be communicated to the other EU countries in order to help market actors form rational expectations about the potential development.

The Danish case - with oligopolies and near monopolies in the processing and distribution of organic products and some of the processing units controlled by conventional farmers - clearly demonstrates the need to include their policies and power play when interpreting the functioning of the organic markets. The market data on e.g. prices and quantities do not represent market determined outcomes but rather administered political decisions. These market features are found in various forms in other EU markets and have to be taken into consideration when interpreting market data.

A special important feature demonstrated in the Danish market is the realisation of maturity gains. The cost reduction reached through effective and efficient logistics, processing, distribution and marketing combined with the high price elasticity of organic products create a self-enforcing development towards increased organic markets probably obtained after a certain threshold level of market size. This level is reached in some markets and still has to be reached in others.

In Hamm *et al.* ^[5] p. 82, the conclusion on the relation between organic supply and demand in the different EU markets reads as follows “the variability of growth rates for demand and supply in different periods of time indicates the difficulties in developing efficiently functioning organic markets”. The development in the Danish market clearly supports this conclusion. It analyses the features of the market which cause these difficulties, and points to the fact that the situation might be even more severe in the individual markets as they approach equilibrium and in the following periods. Hamm *et al.* ^[5] chapter 9, recommends that a combination of supply push and demand pull strategies is applied in order to help the market function better and more efficiently. The inherent difficulties in these recommendations are that

the planners behind these interventions face the same difficulties as the market actors in forming rational expectations of the future development due to the factors analysed in the Danish case. The above arguments and the analysis of the Danish case have been based on an assumption of no external trade of organic products. If foreign trade were a possibility in connection with organic products, trade between the different EU markets could be expected to dampen the fluctuations of prices and supply in the individual markets, thereby promoting a more stable development of the organic markets. Given a common market price for organic products across the EU, surplus and deficit in the individual markets can be levelled out, thus creating a more stable development in the individual markets and in the total organic markets due to the fact that the individual national markets are currently at different levels of development. In the long run, the situation might be different due to oversupply or undersupply within the EU. But for the short and medium term, promoting EU trade of organic products seems a safe way to ensure more efficiently functioning organic markets.

The political steps needed in order to increase trade such as common standards, common recognition of standards and an abolition of trade hindrances lie outside the scope of this article but are important in order to achieve efficiently functioning individual EU organic markets.

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