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## Changing governance in the EU milk supply chain

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**„Institutions in Transition –  
Challenges for New Modes of Governance”**

**IAMO Forum 2010, 16-18 June 2010 | Halle (Saale), Germany**

**Changing governance in the EU milk supply chain**

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**ABSTRACT**

With the 2008 EU’s CAP reform the governance of the EU’s dairy sector changes. This paper focuses on governance structures between dairy farms and milk processors. To get insight in regional differences within the EU, a literature research and interviews are conducted in three case study areas, namely: the Netherlands, Bulgaria and France. Results show that in these countries both farmers and processors have incentives to form hybrid governance structures with a higher level of control compared to the current structures. Most dairy cooperatives have no additional advantage in managing milk quality and milk supply compared to investor owned firms. Chain integration could go a step further in Bulgaria compared to the Netherlands and France given the institutional environment that is not expected to guarantee milk quality and the focus on the export of milk.

**Keywords:** Agricultural Markets, Marketing, Governance and Cooperatives.

## 1. INTRODUCTION

Dairy farming and milk processing require large asset specific investments (HENRIKSEN 1999). Given that milk is a highly perishable product it is processed in production areas. Only processed milk is traded over long distances e.g. in the form of cheese, butter and milk powder. Prices in the different markets for dairy products might vary significantly. Hence, it is rather difficult and costly for an individual farmer to obtain correct market information (HOBBS 2004). Farmers therefore at best can negotiate on the terms of milk supply with processors where asset specificity weakens their bargaining position. The specific characteristics of the dairy sector have influenced the governance of the dairy sector and in some cases (e.g. in Denmark) positively contributed to the development of dairy cooperatives (HENRIKSEN 1999).

Another factor influencing the governance structure is the Common Agricultural Policy (CAP) of the EU. The CAP has by means of price support and supply quotas a large influence on production, structure and profitability of the dairy sector. However, as a consequence of the Health Check in 2008 dairy policies are reformed. With the gradual increase in milk quota, the reduction of intervention levels for dairy products, the phasing out of export subsidies and in the abolishment of the milk quotas in 2014, the EU dairy sector is approaching a new market situation in which it will need to address new challenges. Milk prices are expected to fluctuate more with an average milk price lower than in the past decade (BOUAMRA MECHEMACHE et al. 2008). Because of the lower price level and with increased opportunities for farmers to expand and reorganize production, there is within the EU a restructuring of dairy farming expected.

Milk processors could also experience a very different supply situation, as deliveries to certain factories or even complete companies might change significantly in a relatively short period of time. Also, the institutional environment in which they are functioning will change because production can increase as supply quota will not be legally binding. TACKEN et al. (2009) indicate that the restructuring of dairy farming might put more pressure on the competitiveness of the EU milk processing sector, which currently is slightly below world average. BEKKUM AND NILSSON (2002) argue that it might be rational for the EU dairy cooperatives, to respond differently to identical changes in their institutional environment. In addition, RAFAT (2009) argues that differences between cooperatives and investor owned firms have implications for their flexibility to cope with the challenges ahead and to accommodate the effects of the policy changes in the EU.

Given the change in the CAP the question is how farmers and processors change the governance in the dairy sector. The objective of this paper is therefore an analysis of the governance structure between farmers and milk processors as a result of the change in the CAP. It is hypothesised that the reaction of the dairy sector may vary between regions in the EU. To answer the research objective a literature research and interviews are conducted in three case study areas, namely: the Netherlands, Bulgaria and France. Using transaction costs economics we will characterize expected governance structures.

Section 2 discusses the conceptual framework. The empirical methodology and data are discussed in section 3 while section 4 presents the main results. Section 5 concludes.

## **2. CONCEPTUAL FRAMEWORK**

Several studies have discussed the governance of agrifood chains, paying attention to the specific characteristics of these chains (e.g. COOK et al. 2008, RAYNAUD et al. 2008). Food and agricultural commodities have unique characteristics. Production of agricultural commodities is dependent on seasonality, weather conditions and potential hazards such as the occurrence of diseases. This brings high levels of uncertainty and physical, site and temporal asset specificity (COOK et al. 2008). The asymmetric information about the condition of agricultural products, combined with the fact that the products are perishable and the fragmented production of agricultural commodities (large numbers relatively small dairy farmers), makes food quality and food safety a large concern for food processing companies (RAYNAUD et al. 2008).

Experiences with the privatization of public sectors such as the energy- and water industries, learn us that new forms of governance can be expected to replace the current public forms of governance. These experiences with privatization as a form of deregulation learned us as that privatization not always is a success (JOSKOW AND PARSONS 2008). Next to that, ARGYRES and PORTER LIEBESKIND (1999) argue, prior contractual commitments made by a company can limit its ability to differentiate or change its governance arrangements in the future. The current structure of the milk processing industry also is of influence of the development of the industry. A major objective of studying regulation is to understand its impact, the range of likely responses, and how these play out over time (BENHAM 2005). These changes can be path dependent and vary across individual firms and countries. Policies will give incentives to stakeholders to organize themselves and to influence decisions. Sugar production in the U.S. offers an example of downstream impact of initial regulatory decisions. Once a very complex sugar program was in place, a network of program specialists arose in government and industry and became independently influential.

However, not much is researched on the change in governance in the EU dairy sector as a consequence of the diminishing influence of the CAP. Within the EU dairy sector several levels on governance can be distinguished. First, there is the dairy sector on EU level and all linked international trade and EU policies. Below this level we can distinguish national levels in which public and private governance differs per country. Within countries regional milk markets can exist. The lowest level distinguished is that of individual dairy companies and their supplying dairy farmers. In this paper we will focus on this latter level.

According to Transaction Cost Economics (TCE) dairy processors and farmers can organize transactions among them in different ways. The main message of TCE concerning this choice is that transaction costs arise in connection with the exchange process, and that their magnitude affects the ways in which economic activity is organised and carried out (cf. FURUBOTN and RICHTER 1997). Examples of categories of transaction costs are search and information costs, bargaining and decision costs,

and pricing and enforcement costs. The central idea of Williamson is that when any transaction is described in terms of three key dimensions, it maps the most efficient institutional arrangement (HÖLMSTROM and ROBERTS 1998). These dimensions are frequency, uncertainty and asset specificity (cf. WILLIAMSON 1996; cf. Williamson 1998). Within TCE it is assumed that transaction costs are linked directly to these dimensions. Asset specificity refers to the degree to which an asset can be redeployed to alternative uses, and by alternative users, without sacrifice of productive value (cf. WILLIAMSON, 1996). Two types of asset specificity can be added: connectedness to other transactions and inseparability of previous contractual commitments. Connectedness defines to which degree the dependency of transactions on each other influences the costs parties have to make to agree on their choices and to coordinate activities (GONZÁLES-DIAS and VÁZQUEZ 2008). Governance inseparability defines to which extent prior contractual commitments limit the ability to differentiate or change governance arrangements in the future (cf. ARGYRES and PORTER LIEBESKIND 1999).

Uncertainty can be related to demand uncertainty (demand on markets can vary over time); to technology uncertainty (changes in the production process, new alternatives) and uncertainty on suppliers (varying supply, information asymmetry) (GONZÁLES-DIAS and VÁZQUEZ 2008). The frequency of a transaction matters because the more often a transaction takes place, the more widely are spread (over different transactions) the fixed transaction costs of establishing a non-market governance system. In general, the first transaction requires the highest transaction costs, since for this transaction all details of the transaction have to be defined, while at the next transaction, many details already are defined. Therefore, in general, increasing the frequency of transactions lowers the marginal transaction cost. Connected to this, the transaction costs increase with transactions for a longer period of time as these transactions require negotiation on more details than short-term transactions.

The coordination between suppliers and buyers is of great importance. Coordination costs occur when downstream companies and their different input suppliers not effectively coordinate with each other, when failing to achieve the right relationship between parties. These coordination costs can be reduced when the process is normalized through the creation of routines (cf. GONZÁLES-DIAS and VÁZQUEZ 2008).

Measurement means quantifying the attributes or dimension of a transaction. In fact, what is exchanged among parties in a transaction is a bundle of rights that measure various attributes of the goods and services exchanged or of the performance of agents (cf. NORTH 1986). Problems and costs of measurement pervade significantly and affect all economic transactions (cf. BARZEL 1982). Some dimensions have a natural measure such as the financial compensation or duration. Other dimensions are not continuously measurable, but are discrete choice variables, such as the decision to use a standard provision or a penalty clause. Dimensions like the landscape attributes of milk are even more difficult to measure. When parties have difficulties to define the output or measure the output this increases the risk of opportunism and thereby the transaction costs (GONZÁLES-DIAS and VÁZQUEZ 2008).

Moreover, none of the central hypotheses of contract theory is immune to chronic measurement problems (LYONS 1996). Transaction cost hypotheses require data on organisation form as well as detailed information about the character of transactions

as: the level of uncertainty associated with exchange, the complexity of products and processes, and the extent to which the required assets are specific to the particular relation (MASTEN 1996). Also the contracting parties themselves are confronted with these measurement problems, although they might perceive these in a different way. Measurement problems are one of the causes of incomplete contracting because the contracting parties are not able to write a clear and enforceable contract. These incomplete contracts may lead to opportunistic behaviour concerning execution of the contract or investments. For instance, in the case of incomplete contracts between processors and farmers, future development of consumer prices cannot be fully specified. In a period of low prices buyers have an interest in a long term contract whereas sellers, depending on their expectations concerning prices, possibly have an incentive to negotiate short term contracts.

As mentioned the selection of an appropriate institutional arrangement from a transaction costs economics point of view is based on asset specificity, uncertainty and frequency of the transaction. To simplify, the evolution of the choice on governance to minimize transaction costs can be derived by defining the production cost differences and the governance costs differences as functions of the dimensions of transaction costs ( $T$ ). Where  $\Delta C = f(T)$  the production cost difference between internal organization and the market, and  $\Delta G = g(T)$ , the corresponding governance cost difference. When the sum of  $\Delta C + \Delta G$  is positive, the market is the most attractive choice,  $\Delta C + \Delta G = 0$  reflects indifference between the governance structures, and internal governance is preferred when  $\Delta C + \Delta G < 0$ . Hybrids (e.g. supply contracts), market preserving credible contracting modes that possess adaptive attributes located between classical markets and hierarchies (cf. WILLIAMSON 2002), give incentives to both intensity and administrative control. WILLIAMSON (1981) argues, that if assets are nonspecific, markets will have the advantage in both production cost as governance cost. Markets can aggregate uncorrelated demands and hence can realize risk pooling benefits and can mitigate risk connected to bargaining power and information asymmetry. When assets become more specific, exchanges increasingly will have a bilateral character. The aggregation benefits of markets are reduced and the governance cost of market governance will increase significantly. Therefore, market governance is expected in cases where assets are nonspecific to trading parties; semi specific assets are expected to result in bilateral or obligatory market contracting and assets with a highly specific character are expected to lead to an internal organization that displaces markets. Hybrid arrangements tend to develop specific modes of governance with significant variances in the degree of control over partners. The degree of control depends on the degree of uncertainty and the nature and degree of specific investments that is required by the transactions at stake (see MÉNARD 2007). In the interviews, long term contracts regularly were indicated as expected form of governance in the dairy sector. In this paper, we will define a long term contract as a contract between an individual farmer and processor that prescribes milk quality, milk quantity and milk price for a specific period of time.

There exist different institutional arrangements (contracts) in the same institutional environment and the institutional environment influences the performance and duration of contracts (cf. MÉNARD 2000). It is not easy to obtain measures of the relevant dimensions of the institutional environment that enable us to isolate its impact on institutional arrangements (OXLEY 1999). The institutional environment is analysed by using the following two characteristics: place: the institutional

environment differs among communities; time: the institutional environment is not fixed in time and changes in general slowly.

The first characteristic is that the institutional environment differs among different communities (e.g. countries, provinces and regions). For instance, the existence of norms in the society as a part of the institutional environment in which an organisation is active influences the relative performance of this organisation. The institutional environment differs for dairy farmers in the sense that (1) many EU guidelines are translated in (differing) legislation on national level, (2) enforcement is provided by (different) public authorities and (3) the business environment is appertain to the different case study areas. HOFSTEDE and MCCRAE (2004) showed that personality traits, correlated with culture, influence the business environment of countries.

A second characteristic is that the institutional environment is not constant in time. In a single community only changes in the institutional environment in time can be observed. According to WILLIAMSON (1998) the institutional environment changes considerably in a period of 10 - 100 years. For instance, the recognition of property rights (part of the institutional environment) is not immutable. They may, for example, change from one generation to another (COOTER and ULEN 1997). This can have consequences for the way in which the government recognises and protects assets. Property is a bundle of rights which describes what people may and may not do with the resources they own; the extent to which they may possess, use, transform, transfer, or exclude others from their property. Property rights can be altered by changes in law.

The legal system is a framework which defines the ways in which property rights can be implemented and enforced (MÉNARD 1995). Laws that regulate transfers, as well as the procedures and mechanisms for implementing and enforcing these laws, are central to the effectiveness of contracts (MÉNARD 2000). Perfect institutional environments do not exist; for instance court order issuing procedures are not perfect. Public ordering defines rules of the game for private ordering and a series of mechanisms explicitly designed to enforce contracts and to support transactions (cf. MÉNARD 2000).

### **3. EMPIRICAL METHODOLOGY AND DATA**

To get insight in regional differences within the EU, a literature research is conducted on the structure of the dairy sector in three of the case studies: the Netherlands, Bulgaria and France. Table 1 gives an overview of some of the averages per farm in the case studies and the change over time. Table 2 gives an overview of the production and export of dairy products per country. Annex 1 gives more information on the structure of the milk processing industry in the case study areas. The countries were selected because of characteristics of the dairy sector. In the Netherlands, the dairy farms are capital intensive, land intensive and relatively large (EUROPEAN COMMISSION 2009). The Netherlands is export oriented. Cheese is the largest output. There are only a few processors. More than 90% of all milk is processed by cooperatives (PZ 2009). French farms mainly are diversified and extensive. The French dairy sector had a relatively low restructuring rate (PERROT et al. 2009). The milk processing industry is characterized by the production of diversified products by

many processors. Approximately 45% of all milk is collected by cooperatives while 34% is processed by cooperatives (ORLAIT 2005). Bulgaria has more than 150,000 small farmers with in general 1-2 dairy cows (MAF 2007). Only 20% of the produced milk is delivered to processors. This milk mainly is produced by larger farms. The remaining 80% is produced for self consumption or for the local market. There are many small scale local processors present and a few international large scale processors (DRIES et al. 2008). There are no Bulgarian cooperatives processing milk.

**Table 1: Averages per farm and average change over time in the selected case study areas.**

	EU-15		The Netherlands		France		Bulgaria
	2006	2006/ 2000	2006	2006 /2000	2006	2006/ 2000	2005
Sample farms	8933	-11%	337	-11%	1150	-11%	
Farms represented	289297	-19%	19422	-24%	63643	-10%	152000
Forage area in ha	45	22%	44	21%	57	20%	4.8
Dairy cows in LU	49	19%	72	18%	43	13%	2.3
Land in own occupation - %	39%	-12%	63%	-4%	13%	-28%	
Total labour in AWU	1.9	4%	1.6	0%	1.7	5%	
Family labour in AWU	1.6	-1%	1.5	-2%	1.6	3%	
Milk yield – kg/cow	6973	9%	7800	2%	6423	7%	3541
Milk production in tons	339	29%	564	20%	279	21%	8
FNVA/AWU	31549	24%	55435	11%	23821	5%	5244

Notes: AWU = annual work unit; and FNVA/AWU = net value added per labour unit

Source: EUROPEAN COMMISSION, 2009

**Table 2: Production of dairy products in 2007 in 1000 tons and exports in tons per selected country.**

	The Netherlands	France	Bulgaria
Cheese produced	732.0	1754.7	68.6
Cheese exported	562.6	650.7	16.0
Fresh milk produced	750.0	3764.0	337.2
Fresh milk exported	n.a.	n.a.	n.a.
Butter and –oil produced	129.2	337.2	1.4
Butter and –oil exported	154.0	62.8	1.1
Condensated milk produced	330.7	65.7	0.4
Condensated milk exported	274.0	70.7	77.0
Milk powder produced	1009.0	181.5	193.3
Milk powder exported	151.5	249.5	n.a.

Notes: n.a. = not available; and skimmed and non skimmed milk powder are together

Source: PZ, 2009



Interviews with experts and stakeholders of the dairy sector in the case studies were used to get insight in their expectations towards the governance in the sector as a result of the CAP reform. 20 semi-structured interviews were held in France and the Netherlands. In Bulgaria, 1 semi structured interview and 14 surveys with open questions were held. The explanation on the survey questions took place during a short presentation given to the respondents. Table 3 gives an overview of the interviewed persons, in this paper further referred as ‘respondents’. The interviews were analysed by coding the findings from the interviews systematically into the core categories that together hold a coherent framework using the grounded theory as described in NEERGAARD and ULHØI (2007). In the first phase, open coding, categories were named and their properties and dimensions determined. In the second phase, axial coding, categories were linked at the level of dimensions and properties. In the third phase, selective coding, the core categories were refined to integrate them into a coherent framework. No distinct differences were found in perception of specific interviewed subgroups on the core categories.

**Table 3: Overview of interviews; divided in subcategories**

	<b>Farmers</b>	<b>Chain</b>	<b>Policy makers, public advice, research</b>	<b>Total</b>
France	3	2	5	10
Bulgaria	4	2	9	15
Netherlands	3	3	4	10
Total	10	7	18	35

Source: Project for European Commission with title “Assessing the multiple Impacts of the Common Agricultural Policies (CAP) on Rural Economies” (CAP-IRE), 2009

## **4. RESULTS**

### **4.1 Interviews**

The expectations of the respondents from the selected case study areas are summarized in Table 4. Most respondents in France and the Netherlands expect that the first years after 2013, the rate of restructuring will increase and farms will increase scale relatively fast and specialize further. The Bulgarian respondents expect small farming to disappear and expect the dairy sector to specialize and restructure expeditiously. Most interviewed experts and stakeholders indicate prices of dairy products on the international market will show larger fluctuations. The expectations on the development of the governance of the dairy sector however differ between the case study areas.

**Table 4: Expectations of stakeholders and experts on governance of milk supply and processor's strategy with the abolition of milk quota**

	<b>Relation processor-farmer</b>	<b>Logistics</b>	<b>Strategy milk processors</b>	<b>Institutional environment</b>
France	<ul style="list-style-type: none"> <li>• Long term contracts</li> <li>• No major changes in requirements for physical milk quality<sup>1</sup> from processors</li> </ul>	<ul style="list-style-type: none"> <li>• More attention from processing companies for logistical efficiency: attention on the regional collection of milk, farm size</li> </ul>	<ul style="list-style-type: none"> <li>• Increase focus on the production of value added products</li> </ul>	<ul style="list-style-type: none"> <li>• Possibly national guidelines for supply contracts to regulate regional milk market (in favour of less efficient/unfavourable production areas)</li> </ul>
The Netherlands	<ul style="list-style-type: none"> <li>• Milk price adjustment in contract on monthly basis</li> <li>• No contracting on quantity</li> <li>• Possibly introduction of delivery certificates</li> <li>• No major changes in requirements on physical milk quality</li> </ul>	<ul style="list-style-type: none"> <li>• No major changes in attention on logistical efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Maximize long term revenue from milk sales from members</li> </ul>	<ul style="list-style-type: none"> <li>• No new national regulation on national scale payments.</li> </ul>
Bulgaria	<ul style="list-style-type: none"> <li>• Continuation of long-term contracts</li> <li>• Increase of milk processed by processors (instead of direct marketing)</li> <li>• Increase in requirements on physical milk quality</li> <li>• Increase of chain integration.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in collection at individual farms</li> </ul>	<ul style="list-style-type: none"> <li>• Increase efficient use capacity of processing plants</li> <li>• Increase quality of processed dairy products</li> <li>• Increase value added products</li> </ul>	<ul style="list-style-type: none"> <li>• No new regulation on national scale</li> </ul>

Source: Project for European Commission with title "Assessing the multiple Impacts of the Common Agricultural Policies (CAP) on Rural Economies" (CAP-IRE), 2009

<sup>1</sup>Indicators of the physical milk quality of milk are taste, smell and exterior. Factors that might influence the experience or credence attributes influencing the milk quality such as standards on animal welfare and environment are not included.

In the Netherlands respondents strongly indicate that the cooperatives feel the obligation to collect all milk supplied by their members. Many Dutch dairy farmers currently feel limited by the production constraints from the quota. They are expected to increase scale, until other factors affecting their production will become limiting. They indicate this would be environmental and labour constraints. The dairy cooperatives in the Netherlands (>90% of all milk is supplied to cooperatives) are expected to process the milk and market it as profitable as possible paying the highest possible price to their dairy farmers.

Respondents expect processors in France to negotiate long-term contracts with their suppliers. Processors will increase their attention to logistical efficiency. The potential concentration of milk production in certain parts of France and the disappearance in other parts, is considered as an undesirable development and they indicate the government shares this opinion. The costs attached to landscape protection might increase greatly with the disappearance of dairy in certain part of France. To protect processing companies from the termination of milk collection in less efficient regions, there currently are ideas to impose national guidelines for milk supply contracts between farmers and processors.

Long term contracts are already frequently used in Bulgaria. The Bulgarian respondents indicate to expect that production standards for physical milk quality will increase. From some of the Bulgarian respondents and from the literature (see e.g. DRIES et al., 2008: 23) follows, that many Bulgarian milk processors experience shortage of high quality milk. Processors in Bulgaria focus on assuring the quality standards of the EU and are expected to try to decrease the costs accompanied with this. From the literature follows that some milk processors have set up their own dairy farms (see DRIES et al., 2008). Also from the interviews follows that some stakeholders expect further chain integration.

## **4.2 Discussion**

In the Netherlands, where more than 90% of all supplied milk is processed by cooperatives, milk prices paid out to farmers currently are determined by the international market for dairy products and adjusted on monthly base. Friesland Campina, the main cooperative, pays according to her company performance, a premium on the end of the milk year. Quantity is determined by the supply quotas of farmers. This could be regarded as a hybrid with a relatively low level of control. Transaction costs are expected to go up with the increasing levels of asset specificity and uncertainty. However, when farmers and processors after abolition of the quota, as currently is expected by the respondents, will not contract the supply quantity and/or price, this leads to a hybrid with a lower level of control than the current hybrid. There are several explanations why the Dutch dairy sector would not prefer a higher level of control. Firstly, farmers could underestimate the increase in uncertainty. For instance, it could be that farmers do not expect large price fluctuations. However this is against our results from the interviews. Secondly, farmers could be able to handle large price fluctuations efficiently (against low costs); for instance because (1) they have (or they expect to have) access to capital to overcome temporarily income shortages at low costs or (2) because they are able (or expect to be able) to have an insurance against temporarily income shortages at low costs (e.g. a private insurance

or temporarily income security given by the government or the EU). A third explanation might be that farmers do not trust milk processors. For instance, processors could behave opportunistically because (1) of (perceived) bargaining power since the farmer might have limited alternatives or (2) because of the incapability to measure correctly the experience and credence attributes of milk (HOBBS, 2004). From WILLIAMSON (2004) follows that it would not be logical for milk processors to break the contract, since opportunism would negatively damage their reputation. Because of the recurring character of the transaction, reputation is of great importance for the processors. For cooperatives, with their suppliers as shareholders, one could expect this would even more negatively affect their reputation and might damage the trust of the members, which hold shares in the cooperative. But if farmers look with suspicion to processors and processors cannot show that they behave according to the contract (thus, the costs to persuade farmers are very high), farmers can interpret this as 'bad behaviour'. A fourth explanation is that milk processors have no incentive for increased levels of control. The negotiation costs for milk processors could be considered higher than the costs of supply uncertainty. It is costly to renegotiate prices in contracts with frequently changing market prices for dairy products. Following the market prices could be a less costly solution. Also, cooperatives, formed to represent the interests of their members, historically have been considered to represent these interests by processing all milk their members supply, hereby guarantying to pay the highest possible milk price to their farmers. It could be too costly to change this strategy (e.g. chance on strikes, members that stop delivering, costs of informing members etc.), even while hybrids with higher levels of control, for instance long-term contracts, would be in the interest of their members. Next to that, none of respondents expected large differences in the geographical distribution of farms or problems related to location-specific undersupply of milk in the Netherlands. Respondents indicated not to expect problems with the quality of milk supplied by the Dutch dairy farmers and dairy farms do not show very large seasonal fluctuations in production (however there is some). This might decrease the incentive for milk processors in the Netherlands to negotiate hybrids with higher levels of control to reduce the processors' uncertainty on milk quantity and quality.

In France, where 45% of all milk is collected by cooperatives, the respondents indicate to expect that milk supply will be regulated by long-term contracts, which can be defined as hybrids with high levels of control. This development is expected to be followed by private companies as well as by cooperatives. Several explanations can be given why this expectation is different from the expectation in the Netherlands. Firstly, the costs of an increase in uncertainty could be larger because (1) French dairy farmers have (or perceive to have) less efficient instruments to handle price fluctuations or (2) because French dairy farmers in general are expected to be less competitive in the future compared to Dutch dairy farmers. French farmers are therefore more vulnerable to milk price fluctuations. As follows from Table 1, French dairy farmers on average have a lower income per labour unit than Dutch dairy farmers. Also, larger differences in farm structure and farm performance are expected in France (see e.g. PERROT et al., 2009). Secondly the incentive for processors to contract milk supply could be larger in France than in the Netherlands because there is more need to control milk supply. This is because a much larger percentage of the production is processed into dairy products for domestic consumption. Considering exports, a much larger percentage is in dairy specialties such as special cheeses. Although processors are very diverse, most French milk processors are more focused

on meeting specific market demands than on producing for commodity markets, which increases the incentive to control supply. This also might decrease the effects of price fluctuations on the international markets for dairy products on company performance, and hereby the frequency supply contracts need to be renegotiated and the costs to renegotiate these contracts. A third explanation is that processors have a larger incentive to use contracts to guarantee the milk supply to their factories. Almost all interviewed respondents indicate that the development of the sector will greatly differ between regions within France. While historically because of regional regulation of the milk quota, dairy farms developed rather homogeneous between regions, after the abolishment certain regions of France are expected to be more favourable for further development of the dairy sector, while other parts will be less interesting for dairy farming. The spatial concentration of farms is important while it may alter the logistical efficiency for a processor in a certain region. However, dairy farms are still present and also specific investments in dairy processing plants have been made in these regions leading to path dependency.

On the other hand, the collection of milk in certain areas of France might become uninteresting for milk processors. Respondents expect given the French policy that tries to combine agricultural land use with landscape stewardship, the French government to have an interest in the maintenance of dairy farming in several areas that are economically less attractive for future dairy farming. This might lead to the introduction of national guidelines, obliging milk processors to collect milk from all farms in France. This security might give individual farmers in these areas sufficient incentives to continue dairy farming.

In Bulgaria, milk processors and farmers quite regularly have long-term contracts on milk supply and most respondents indicate to expect this will increase further in the future. Some respondents indicate to expect further chain integration. The shortage of milk supply of high quality increases the incentive for milk processors to secure their milk supply. While the respondents indicate that there are no problems with milk quality in France and the Netherlands, the physical quality of milk is a major point of attention in Bulgaria and brings high monitoring costs. Next to that, DRIES et al. (2008) argue that processors experience opportunism of farmers, as farmers not always meet contractual agreements and easily change processor. The institutional environment is not expected to guarantee supply of milk with the demanded quality in Bulgaria. Corruption, fraud and deficiencies in the court system are common in Bulgaria and are therefore probably limiting the enforcement of contracts and regulation. Also, exporting processors demand milk meeting quality standards superior to the national standards (BACHEV, 2007). The chain integration therefore could go a step further compared to the Netherlands or France implying hierarchies instead of hybrids.

## **5. CONCLUSIONS**

Uncertainty about income from dairy farming will increase with increasing price fluctuations as result of the changing CAP in France, the Netherlands and Bulgaria. With the abolition of the milk quota, milk processors are expected to face an increase in uncertainty on milk supply in terms of quantity and input costs. Hence, uncertainty connected to transactions for milk between farmers and processors will increase for both farmers and processors. Asset specificity of dairy farmers becomes more

important as farmers scale up and specialize progressively. Relevant dimensions of transactions are the location of the farm which implies location specific investments and investments connected to dairy. Higher levels of asset specificity on farm level and higher levels of uncertainty will give more incentives both for farmers and processors to form hybrids with a higher level of control.

Most dairy cooperatives have no additional advantage in managing milk quality and milk supply compared to investor owned firms as with numerous suppliers, free riding of individual farmers is possible. Both depend for securing their milk supply on local farmers delivering milk to their facilities. Alternatively, an unbalance in supply and demand could disproportionally affect the performance of individual farmers and the cooperative. It might be beneficial for an individual farmer to deliver additional milk to the cooperative as revenues from milk sales will increase. This additional milk supply might induce an unbalance between milk supply and demand, which eventually negatively affects the milk price paid out to farmers. But when the decrease in profit induced by the lower milk price is less than the increase in profit induced by the increase in milk supply, the individual farmer still faces an increase in profit. Chain integration could go a step further in Bulgaria compared to the Netherlands and France given the institutional environment that is not expected to guarantee milk quality and the focus on the export of milk.

The analysis is subject to some qualifications. Firstly, in the case study areas only 10-15 experts and stakeholders have been interviewed. These numbers are limited. However, the interviews enable us to make a comparison between case study areas and to focus on governance. Secondly, the interviews were conducted in the second half of 2009, when EU milk prices were at historical low levels. This might have influenced the expectations of the respondents. Thirdly, transaction costs themselves have not been measured. In addition, no detailed (hypothetical) contracts were analysed. This could lead to biases because of differences in interpretation. Finally, other factors, e.g. general economic developments and preferences about contract terms like contract duration and payment levels also play a role in contract choice.

Despite the qualifications this research contributes to the existing literature because it gives insight in how governance changes between dairy processors and farmers in different case study areas as a reaction to the 2008 CAP reform.

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## ANNEX 1

Table I.1: Milk quota (in 1000 tons) per quota year and over or undersupply of the quota per selected country

	2000/2001	+/- %	2007/2008	+/- %
The Netherlands	10,992.9	-0.8	11,114.0	+1.3
France	23,832.2	-0.7	24,135.2	-1.4
Bulgaria	n.a.	n.a.	893.7	-14.9

Source: PZ, 2009

Table I.2: Total number of milk processing companies, total turnover, total number of employees, companies categorized by number of employees and % milk processed by cooperatives in the case study areas in 2005.

	The Netherlands	France	Bulgaria
Total number milk processing companies	260	1,462	411
Total Employees in 1,000	10.5	60.3	8.1
Total Turnover in 1,000 mln	7.2	24.1	0.2
Processing companies with <20 employees	220	1,150	n.a.
Processing companies with 20-49 employees	10	130	n.a.
Processing companies with 49-200 employees	25	130	n.a.
Processing companies with >200 employees	5	52	n.a.
%milk collected and/or processed by cooperatives	>90	43% milk collected, 34% is processed by cooperatives	+/-0%

Source: Eurostat, 2008; PZ (2009); Onilait (2005).