Coordination of collective action in the agro-food sector

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Abstract— **Collaboration between stakeholders in the agro-food sector is nowadays a common phenomenon. Despite the huge diversity observed, this paper argues that collective action always results in the establishment of a collective organization (whether formally organized or not), which is characterized by the presence of a coordination centre. This organism represents all partners united in the collective and performs tasks by order of the individual members and the group. From a theoretical point of view, all collective organizations qualify as hybrid organizations, which can be studied through the lens of Transaction Costs Economics.**

Hybrids governance structures are a large set of arrangements that are situated between markets and hierarchies. When organizing transactions, hybrids do not purely rely on the price mechanism or authority, but rather on an interplay of four coordination mechanisms. These coordination mechanisms are the central element of this paper and we hypothesize that their degree of formalization is positively correlated with the complexity of the tasks faced by the coordination centre.

To test this hypothesis, a survey was designed and information was gathered on some general and organizational characteristics of 65 collective initiatives in the Flemish agro-food sector. Information on the coordination mechanism could thereby be directly gathered, but the complexity of the tasks was approximated by the collective organization's objectives, the characteristics of the specifications in force and the entry rules for members. The analysis proves that there is indeed a positive relationship between the degree of formalization of the coordination mechanisms on the hand and the complexity of coordination centre's tasks. Information devices occurs in combination with informal cooperation in small groups, contracts are adopted by groups of 5 to 14 members to realize medium complex objectives and formal coordination (extern regulation and new governance bodies) is finally linked to quality differentiation, which requires considerable efforts in the definition and enforcement of product and/or process specifications.

Keywords— **Collective action, coordination mechanisms, hybrid governance structures**

I. Introduction

Together with the evolution from the agro-industrial model to the sustainable rural development model [1], agro-food markets have evolved from anonymous, mass food markets to quality-food markets. These are, amongst others, characterised by a clear trend towards coordination between actors in food supply chains, new forms of dynamism and innovative forms of cooperation, such as alternative food supply chains [2]. Socially embedded relations are a central element within these new supply chain configurations and great efforts are generally punt in establishing and maintaining transparent, 'shortened' chains of connection between food producers and food consumers [3]. The emergence of these new governance structures is driven by several factors, such as the changing relations between supply chain actors due to the concentration processes in the retail and processing sectors, the growing importance of quality standards, considerable changes in consumer habits and preferences, the increasing attention for the multifunctional dimensions of agriculture and the establishment of new markets for public goods and services [4, 5].

Collective action in food supply chains is often adopted for reasons that relate to supply chain logistics, but it can also be used as a strategic instrument, for realizing market differentiation, for increasing market share, or for obtaining niche protection [6-8]. Besides the aim of collective action, we focus our analysis on the capacity of collective organization to coordinate the actions of the individual members. Collective organizations are hereby defined as the outcome of (in)formal cooperation between two or more companies in order to realize a common objective or effect. The partners can consist of different types of food supply chain actors (such as farmers, processors, retailers or consumers), but also non-chain actors like the government or environmental organizations. Each collective organization is furthermore characterized by the presence of a coordination centre and their activities, organization and coordination mechanisms applied are at the core of this paper.

Our analysis builds upon the general framework of New Institutional Economics and especially transaction cost economics (TCE) and the economics of hybrid organizations, which both have transactions or the transfer of rights between actors as the unit of analysis. Arranging transactions among partners is namely a decisive for taking advantage of the division of labour, but this also requires coordinating complex devices to organise the transfers (micro level) and institutions to facilitate and enforce the transfers (macro level) [9]. Our attention is on the micro level analysis of transactions and the paper investigates which objectives are realized through collective action, how the member's transfers of rights are formalized and the coordination mechanisms applied.

The paper is structured as follows. First, we elaborate upon some general characteristics of TCE and the economics of hybrid organizations and review the literature on coordination centres, focusing on the different tasks they perform and the coordination mechanisms applied. This provides us with the necessary theoretical background to test the hypothesis that a more formal organization and a higher degree of coordination are needed when the coordination centre has to perform more complex tasks. Section three will therefore discuss the characteristics of a sample of collective organizations in the Flemish agro-food sector. The section starts with a descriptive analysis of the relevant variable and an exploration of the relationship between the different variables. Then all variables are entered into a multiple correspondence analysis to explore the correlation between the coordination mechanism and the descriptive variables. The paper concludes with the discussion of the findings and the research hypothesis in the final section.

II. Coordination centres in food supply chains

A. Introduction to hybrid governance structures

It was already mentioned in the introduction that we frame our analysis within the TCE framework. The field of TCE has evolved significantly since the early works of the founding fathers Coase and Williamson [10, 11], but the basic principles have remained unaltered: the organization of transactions involves transaction costs and these costs can be minimized by implementing the most appropriate governance structure. The theory furthermore postulates that governance structures have an important impact on the economic performance of commercial actors, and that these governance structures can be analyzed through rigorous theoretical and empirical methods [12]. Based upon Williamson's initial analysis [13], the literature identifies three factors that influence the size of transaction costs: (i) asset specificity or the degree in which an asset can be redeployed to alternative uses without the loss of productive value, (ii) the frequency of transactions (as recurrent transactions make it easier to recover the costs of specific investments) and finally, (iii) the environmental and behavioural uncertainty that surround the transaction. It is then the interplay of these three factors that will determine which governance arrangement is the most appropriate [13-15].

These external factors will however not be studied in depth in this paper, as our analysis focuses on the internal aspects of collective organizations, but the analysis of these factors gave rise to identification of three main groups of governance structures (as shown in , with hybrids representing a whole range of organisational forms between markets and hierarchies. These governance structures can best be described as specialized governance structures for dealing with bilateral dependence without going as far as integration [13-15].

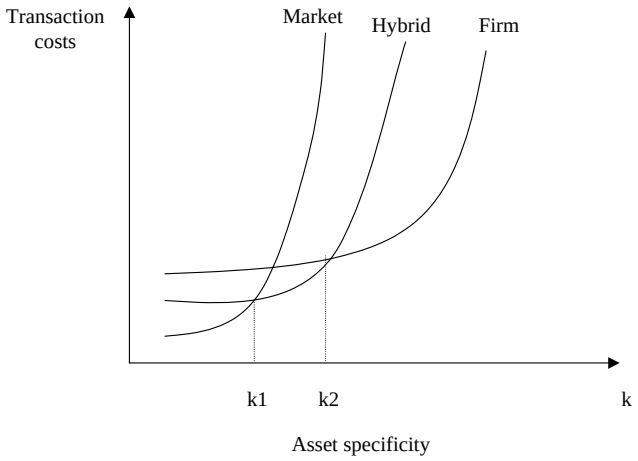

Fig. 1 Asset specificity and transaction costs under different governance structures [Source: 13]

Hybrid governance structures are very prominent in the agro-food sector [9] with farmers' cooperatives, interprofessional organizations that regulate and market PDO products, collective trademarks and contract farming as examples. Despite the large heterogeneity of hybrids governance structures, Ménard [14] identifies three common characteristics:

- The partners in a hybrid governance structure pool (part of) their resources and their strategic decision rights, but keep at the same time the majority of their property rights and their associated decision rights distinct
- The relationships between partners are regulated by contracts, but these contract are in general incomplete and not tailored on purpose and
- Competition persists between the partners in a hybrid and between hybrids and alternative organizational forms.

Especially the first two characteristics and their outcomes are of interest for this paper. The transfer of decision rights and the relationship between partners give rise to a coordination centre. The following paragraph continues with the discussion of the literature on these coordination centres, their role and functioning in hybrid governance structures and the coordination mechanisms that are adopted. These findings are then complemented by the results of a study on Flemish collective organizations that are involved in the agro-food sector.

B. Coordination centre and mechanisms

Coordination centres are in this paper defined as the entities that represent the collective organization and perform tasks by order of the collective and the cooperating members. In the agro-food sector, these tasks can be very diverse, such as quality coordination amongst partners and the elaboration of food safety guarantees [8, 16, 17], the reduction of information asymmetry between partners [18, 19], the development of a collective labelling system [15, 20], coordination of supply and demand [9, 21] and collective marketing activities [22, 23]. Although this enumeration shows that a lot of research has been carried out on hybrids in the agro-food sector, the information on coordination centres and their coordination mechanisms is very limited. This paper aims to contribute to the description of these elements and therefore investigates how coordination centres can assure internal governance without purely relying on prices (as in markets) and when it cannot simply impose its rules as is the case in hierarchies. Ménard [24] identifies four different key mechanisms, which each delineate various degrees of authority:

- Information devices

The need for information devices as a coordination mechanism has evolved from a background of asymmetric information between partners, while the partnership is at the same time also severely constrained the role of prices. The information devices are bi-directional and can function amongst partners, but also as an interface with the environment. This coordination mechanism can be found in almost any example of collective organization to enhance the transfer of decision rights by the members.

- Contracts

Contracts always had a significant role in cooperation and collective organizations, but, according to Ménard [14, 15, 24], their role has been overstated due to the problem of incompleteness and the need for adaptability in a changing world. Neo-classical contracts are typical for hybrid organizations and these are conceived as self-enforcing mechanisms that can be formal and/or informal and facilitators for organizing the relationship between partners.

- Exogenous regulator or monitor

Incomplete contracts and/or an exogenous impulse to cooperate are motives for the establishment of exogenous monitoring. Distinction can hereby be made between monitoring with public authorities as initiator, private monitoring initiatives and a combination of public and private monitoring (e.g. private certification body that is recognized by the government to perform certain controls).

- A governing body of its own

The final coordination mechanism is the establishment of a formal framework within which contracts are initiated, negotiated, monitored, enforced and terminated. It concerns the building of a formal authority, can take different forms and involves a significant degree of centralization, formalization and control over property rights.

The order of the coordination mechanisms also reflects Ménard's proposition that the higher the benefits of coordination and/or the complexity of transactions, the higher the costs of governance for getting that coordination. There is hence a trade of between a growing degree of formalization and centralization on the one hand and coordination benefits on the other [24]. Until now, quantitative research on this matter is virtually inexistent and will therefore be investigated in the remainder sections of this paper.

III. Research setting

To explore the research question, we rely on a database that describes 65 collective organizations operating in the Flemish agro-food sector. These initiatives were selected from an initial inventory of 402 examples of all types of collaboration that involve farmers. The database was composed based on existing inventories on collective action and complemented with the input of experts who guide collective action amongst farmers and between farmers and other stakeholders. Because of the presence of inactive or incomplete initiatives, but also initiatives that are not complementary with our focus on the coordination of marketing oriented activities, the following criteria were designed for the selection of initiatives: (i) complete and active initiatives, (ii) collaboration around a marketable product (food or non-food), (iii) involvement of several partners, (iv) long-term involvement of the partners in the collective organization and (v) only one replication of each initiative (especially farmers' markets and individual food teams were overrepresented in the initial inventory).

In the next research phase, information on the initiatives was gathered through a survey, that covered questions on the following topics: (i) start and objective of the initiative, (ii) characteristics of the partners in the collaboration, (iii) size and evolution of the initiative, (iv) internal organization and governance, (v) tasks and financing of the coordination centre, (vi) product characteristics, (vii) characteristics of the main marketing transactions and (viii) support (both financial and other types) granted to the collective.

This lead to an extensive database with information on collective organizations, but only a small number of variables will be addressed in this paper to explore how general characteristics and elements on the start of an initiative can be related to the coordination mechanism in practice. We thereby test the hypothesis that there is *a positive relationship between the formalization of the coordination mechanism and the complexity of tasks the coordination centre has to realize.*

In the next section, we will discuss the results of a descriptive analysis of the data, non-parametrical comparisons between the (categories of the) different variables and a multiple correspondence analysis that relates variable categories with the four coordination mechanisms identified.

IV. Results

A. Characteristics of the collective organizations

The first part of our analysis concerns the description of the initiatives concerning some general elements (type of product, number of actors involved and direction of the collective action within the chain), a description of the initiative's characteristics at the start (initiator, reasons for setting up the initiative, initial objectives and starting period) and some elements on the way in which they are organized (entrance rules, prescriptions applied and coordination mechanisms in place). This descriptive analysis not only allows explore the characteristics of our database, but also enable us to define and explain the choices that have been made. An overview of the characteristics is shown in Table 1.

The first group of variables in this descriptive analysis concerns some characteristics that should help us to get a general view of a collective organization. Three questions are thereby addressed: Around what type of product is the collective action organized? How many actors are involved? How do these actors relate to each other? Are they situated on one particular chain level or does the initiative concerns collaboration between actors combined at different levels in the chains, e.g. collaboration between a farmers and a processor?

A first observation concerning the data is that several general characteristics have one predominant category. This dominance could be caused by the nature of our inventory and selection criteria, but we believe that it much more plausible to acknowledge that this prevalence is a true reflection of the reality of collective action in Flanders. It can then be summarized that the collective organizations in the Flemish agro-food sector are mainly concerned with food products (76,9% of the 65 initiatives) and involve members that are situated at the same chain level, for example a group of farmers (61,5%). The number of members per initiatives is more evenly spread over the categories, with ca. 30% of the groups that have less than 5 or between 15 and 50 members. The other two groups (between 5 and 14 and more than 50 members) each represent one fifth of the collective organizations in our database.

Table 1. Descriptive characteristics of the 65 collective organizations in the sample

Characteristic	Categories	Number of initiatives
	General characteristics	
Type of product	• Food products	50
	• Non-food products	9
	• Both food and non-food products	6
Number of members	• Less than 5	19
	• Between 5 and 14	13
	• Between 15 and 50	20
	• More than 50	13
Actors involved	• Several actors at one chain level	40
	• Collaboration between chain levels	7
	• Combination of previous types	18
	Start of the initiative	
Starting period	• Before 1990	6
	• Between 1990 and 1999	19
	• 2000 and later	40
Initiator	• Collective	51
	• Leading partner	7
	• Third party	7
Reason for the start of the initiative	• Perceived opportunity	22
	• Problem and/or crisis in the sector	8
	• Project funding available	4
	• Advantages of short supply chains	45
	• Improving sales	6
	• Replication of successful initiatives	3
	• Improving the offer	10
Aim of the initiative	• Composing a collective offer	5
	• Collaboration for sale	8
	• Collective (processing and) sales	21
	• Facilitation of members' activities	8
	• Quality differentiation	23
	Organizational characteristics	
Type of collective organization	• No formal organization	12
	• Open group	24
	• Club	29
Product(ion) specifications	• No specifications	26
	• Organic prescriptions	14
	• EU protected designation	6
	• Own specifications	19
Coordination mechanism	• Information devices	14
	• Contracts	33
	• Exogenous monitoring	5
	• A governing body of its own	13

The second section of the table then focuses on variables that describe the initiatives' start, with data on the starting period, a classification of the initiator, the reasons why the collective action was started and the initial objectives the partners wanted to realize. The data learn that the majority of the initiatives (61,5%) were founded in the year 2000 or later, 29,2% of the initiatives were started in the nineties and 9,2% even started earlier (seventies and eighties). An important number of collective organizations (78,5%) were initiated by a group of people. The analysis of the motivations to start learns that one third of the initiatives (33,8%) started because of the starter's perceived opportunities to differentiate their product or to realize a certain market share with a new product. Other motivations to initiate collaboration were to capture the advantages of short supply chains (18,5%), to be able to compose a more balanced offer (15,4%), to overcome problems and/or crises in the sector (12,3%) and several less important reasons (20,0%). The final variable discusses the initiatives' objectives and these are to a large extent in line with the occasions to start the collaboration. The two most important objectives are the implementation of quality assurance and quality differentiation schemes (35,4%) and the establishment of a supply chain for collective sales (whether with collective processing or not) (32,3%). Other objectives are the facilitation and guidance of the members' activities (12,3%), collaboration for sale (without joining the products of the members together) (12,3%) and the composition of a collective offer by exchanging the members' products (7,7%).

In section II, we argued that despite the apparent differences, all collective organizations have a centre of coordination. The third groups of variables now try to capture on the one hand the tasks that are attributed to such coordination centres, namely the establishment of rules for the entrance of new members and the codes of practices in force and the coordination mechanisms on the other. A first organizational characteristic that may determine the complexity of the tasks to be tackled by the coordination centre and the coordination mechanisms needed are the prescriptions or codes of practices in place. We hereby refer to product and production techniques imposed by the collective to all partners, but these do not concern the rules that describe elements like the functioning of the group and the members' rights and duties. We thereby distinguish two groups of initiatives that do not design product(ion) specifications themselves. Forty percent of the initiatives do not have any prescription, while 21,5% requires organic certification without adding other prescriptions. In the other two cases, the coordination centres have developed own prescriptions and distinction can be made between initiatives who fit their code of practices in with the European legislation on the promotion and protection of food products (9,2%) and those who develop their own, independent requirements (29,2%).

Another task of the coordination centre (which is expected to influence the coordination mechanism in place) is the development of entrance rules that

determine which partners are in the group and which are out. Accession is not an issue in groups that have no formal rules and organization (18,5%), but the initiatives that have implemented formal rules and codes of practices are categorized classified into two categories. Open groups, on the hand, are characterised by the fact that everyone who is in accordance with the code of practices can enter the group (36,9%), while clubs, on the other, select the new members themselves (44,6%).

Coordination mechanisms, as described in section II, are the final organizational characteristic in our descriptive analysis. The results learn that contracts (both formal and informal) are the most prominent mechanism (50,8%) in our sample, followed by new governing bodies (20,0%), information devices (21,5%) and exogenous monitoring (7,7%).

B. Exploration of coordination mechanisms in collective organizations

After the general discussion of the sample characteristics in the previous paragraph, we continue our analysis and explore the relationship between the variables to test relationship between coordination mechanisms and the coordination centre's tasks. We thereby use the three organizational characteristics and the objective as core variables.

The first step in our analysis is a correlation analysis between these four variables. The results, summarized in Table 2, learn that there is a significant positive correlation between the coordination mechanism in place and both the type of specifications applied and the aim of the initiative, but these last two variables are also correlated between themselves.

Table 2. Pearson correlation of the organizational characteristics and the objectives of the initiatives

Variables	1	2	3	4
1. Coordination mechanism	1,000	,032	,595**	,623**
2. Type of collective org.	,032	1,000	-,028	-,135
3. Product(ion) specifications	,595**	-,028	1,000	,668**
4. Aim of the initiative	,623**	-,135	,668**	1,000

**. Correlation is significant at the 0.01 level (2-tailed)

The Kruskal-Wallis H test allows us to compare the distribution of initiatives over the different categories of the variables for the four coordination mechanisms. To gain more insight in the nature of the correlations between the variables, the distribution over the categories is explored through cross-tabulation and non-parametric testing (Mann Whitney and Kruskal-Wallis H tests). The results of these analyses are shown in Table 3. An important note hereby is that the variables' categories are ordered so that they reflect (according to our judgment) an increasing complexity. For the objectives of collaboration, for example, this implies that we consider the composition of a collective offer the least and quality differentiation the most complex objectives.

The results show that the objectives and specifications indeed differ according to the coordination mechanism in place. Further one-on-one comparisons of the coordination mechanisms (through Mann Whitney tests) learn that, for both variables, there are no significant differences between information devices and contracts and between exogenous monitoring and new governing bodies. The aims and prescriptions of initiatives with contracts are however significantly less complex in comparison with exogenous monitoring (p-value is 0,034 and 0,001 for the aims and specifications respectively) and new governing bodies (each have a p-value of 0,000). Information devices have furthermore less complex objectives in comparison with new governing bodies (p = 0,000) and their specifications are less complex in comparison with exogenous monitoring (p=0,000) and new governing bodies (p=0,000).

C. Coordination mechanisms in relation to other characteristics

A final part of our analysis concerns a multiple correspondence analysis. This technique is used to get a visual impression of the link between the four types of coordination mechanisms and the variables that describe the actual state of the collective organizations. The results of the analysis is a two dimensional figure that visualises the relation between the categories of the variables included and the cases. Multiple correspondence analysis is a technique for data-reduction that plots cases of the same category near to each other. In a two-dimensional figure, two sets of values are calculated to reach a maximal spreading of the categories [25, 26].

As mentioned higher, our multiple correspondence analysis concerns the actual state of the collectives. Next to the organizational characteristics and objectives, the included variables are the number of members, the type of product and the direction of the collaboration (at one chain level, between levels or a combination of both). This analysis results in a model with two dimensions that has a Cronbach's Alpha

value of 0,756. The graphic outputs of the model are shown in Fig. 2 and Fig. 2.

Table 3. Objectives, collective organization and specifications in function of the coordination mechanism

Variable and categories	Coordination mechanism			
	Information devices (n = 14)	Contracts (n = 33)	Exogenous monitoring (n = 5)	New entity (n = 13)
Aim of the initiative (%)*				
• Collective offer	35,7	0,0	0,0	0,0
• Collaboration for sale	7,1	18,2	20,0	0,0
• Collective sales	28,6	51,5	0,0	0,0
• Facilitation	7,1	21,2	0,0	0,0
• Quality differentiation	21,4	9,1	80,0	100,0
Type of collective organization (%)				
• No formal organization	50,0	12,1	0,0	7,7
• Open group	7,1	30,3	80,0	69,2
• Club	42,9	57,6	20,0	23,1
Product(ion) specifications (%)*				
• No specifications	71,4	48,5	0,0	0,0
• Organic specifications	14,3	33,3	0,0	7,7
• EU protected designation	0,0	3,0	0,0	38,5
• Own prescriptions	14,3	15,2	100,0	53,8

* indicates that the Kruskal Wallis test has found a significant difference between the coordination mechanisms

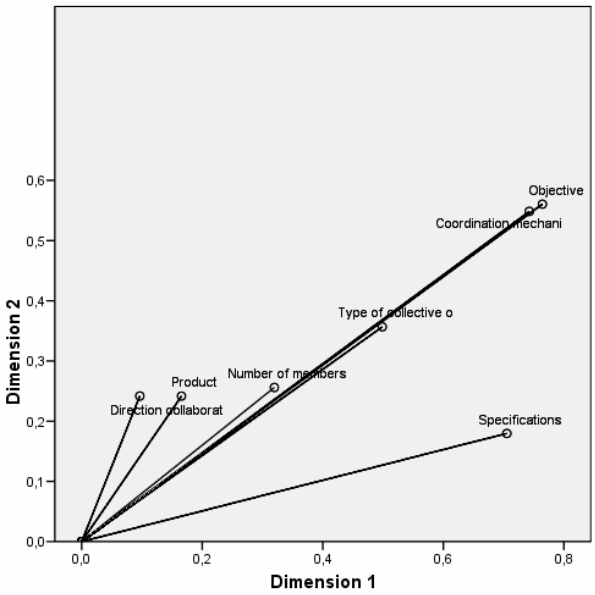

Fig. 2 Plot of discrimination measures resulting from the multiple correspondence analysis

The plot of discrimination measures identifies the variables that determine each of the dimensions in our model. The first dimension has an eigenvalue of 3,294 and accounts for 47,0% of the variance. This dimension is mainly determined by the specifications in place, as this variable has relatively higher values for dimension 1 in comparison with dimension 2. The second dimension has an eigenvalue of 2,385, explains 34,1% of the variance and is mainly determined by the direction of the collaboration and the type of product. The other variables in the analysis have comparable values for both dimension and have thus an impact on both dimensions.

The joint plot of category points (shown in Fig. 3) reveals which characteristics are in our dataset most often combined with each of the coordination mechanisms. The results learn that three 'clouds' of characteristics can be identified around the coordination mechanisms, which are generally in line with our hypothesis and Ménard's proposition, as mentioned earlier in this paper.

Information devices, the most informal and least formalized coordination mechanism, is by the collective organizations in our dataset often combined with other characteristics of informal collaboration between partners. It concerns the absence of a formal organization (and thereby the absence of entry rules), small groups (less than five members) and, to a lesser extent, a simple objective like the composition of a collective offer. The fact that these informal coordination mechanism and loose cooperation often concerns the vertical cooperation between actors at different levels in the chain is a surprise, but should mainly be attributed to our dataset. In the early phases of the research, traditional examples of vertical cooperation, like supply contracts to large processors and retailers, were not included in the inventory. Our focus was more on innovative, quality-oriented examples of vertical supply chain coordination and these appear to be organized rather informally.

Contracts are a more formal coordination mechanism and these appear to be linked with

simple to medium complex objectives (collaboration for sales, facilitation and collective sales). The coordination mechanism is adopted to govern relatively small groups (5 to 14 members) that have chosen to use of the national organic specifications to define the quality of their products. They furthermore apply club rules to regulate the entrance of new members and the combination of horizontal and vertical collaboration. The presence of non-food products can also be linked to this coordination mechanism.

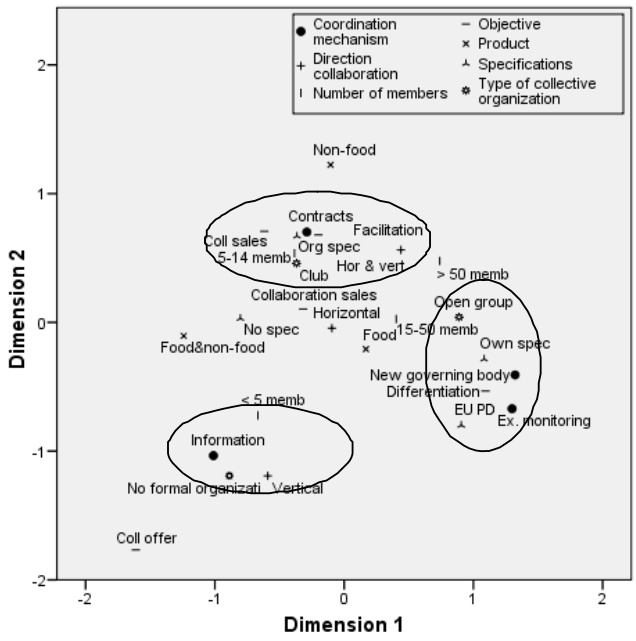

Fig. 3 Joint plot of category points resulting from the multiple correspondence analysis

The final group of characteristics in the graph concerns the two most formal coordination mechanisms, namely *exogenous monitoring and new governance bodies*. In correspondence with the research hypothesis, the coordination centres of these collective organizations with formal coordination mechanisms have, according to our classification, the most complex task to realize: the realization of quality differentiation. They therefore to develop and enforce a brand based upon own prescriptions or a code of practices which is based upon the EU rules on protected designations. These initiatives have in generally a medium to large scale and function as an open group.

Next to the characteristics that can be linked with the three groups of coordination mechanisms, there is also a cloud of dots between the three circles. These characteristics occur in our dataset in combination with all coordination mechanisms and can therefore not be a located to one specific coordination mechanism.

V. Conclusions

Collective action is nowadays a common phenomenon in food supply chains and is adopted to improve supply chain logistics, but also as a strategic instrument to realize diverse objectives. This collective action and the resulting organizations are very diverse, but this paper aimed to analyze collective organization's capacity to coordinate the actions of the individual members and therefore adopted a Transaction Cost Economics approach. Collective organizations were thereby defined as the outcome of (in)formal cooperation between two or more companies (which can be any food supply chain actor or non-chain actor) in order to realize a common objective or effect. Each of these organizations is furthermore characterized by the presence of a coordination centre, which represents the collective organization and performs tasks by order of the collective and the cooperating members.

To test the hypothesis that there is a positive correlation between the coordination mechanism applied and the complexity of the objectives and the tasks that have to be performed, a survey was performed with 65 examples of collective action in the Flemish agro-food sector was performed. The data were then explored through a descriptive analysis, non-parametrical data testing and finally, the execution of a multiple correspondence analysis. We thereby focused upon two main tasks, (i) the elaboration and enforcement of product(ion) specifications and (ii) the rules for the accession of new members. The results of our analyses confirm our hypothesis, as there are indeed significant differences between the coordination mechanisms. We namely found that relatively simple objectives (such as the composition of an offer and facilitation activities) and the absence of specifications are more common in the less formal coordination mechanisms, while the design of own prescriptions and quality differentiation as an objective are linked to the more formal coordination mechanisms. Concerning the entrance rules, no differences could be found between the different coordination mechanisms.

The economics of hybrid organizations and the coordination mechanisms defined by Ménard [24] are very suitable starting points for the analysis of coordination centre, but the challenge is now to strengthen the theoretical framework by quantitative research. This paper was hereby a first attempt to test (part of) the proposition that costs of governance are increase when there are higher benefits of coordination and/or more complex transactions, but future research and especially more extensive datasets will be needed to analyse this topic in depth.

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