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Configurations of global value chains in the agricultural technology industry in North West Germany

*Christine Tamásy & Maria Tepe*

*Abstract:* The global value chain approach is used as an analytical tool to unpack the network configurations of the agricultural technology industry in North West Germany. The case study approach is based on in-depth investigations of six globalizing lead firms and their governance of supplier relationships. These medium sized businesses each hold a leading position within the agricultural technology industry on a European or global scale, but are usually unknown to the general public ('hidden champions').

The paper describes the primary activities of the respective value chains and identifies relevant external partners (primarily suppliers) which contribute to processes of value creation in lead firms. Subsequently, the spatial organization of relationships and governance between lead firms and suppliers are considered, from the perspective of the lead firms as well as from the perspective of individual suppliers. The results illustrate the complexity of value chains in the agricultural technology industry and relevant process variables are identified. The analyzed lead firms are characterized by a huge heterogeneity, prefer long-term relationships with their suppliers and use different forms of governance. The 'market' is the most commonly used type of governance, followed by 'relational', 'modular' and 'hierarchy'. Two modified types of governance are suggested based on the empirical analyses: 'market-relational' and 'modular-relational'. The location of suppliers in close spatial proximity to lead firms might play a role but is not always necessary.

## **1. Introduction**

This paper summarizes a research project entitled „Hidden champions of a globalizing agricultural and food industry in Lower Saxony“ which was funded by the ministry of science and culture of Lower Saxony over the period 2011-13. Theoretical considerations relate to concepts which discuss multi-scalar value chains and their governance. The innovative part of the paper is the empirical analysis which is based on intensive case studies of so called 'hidden champions' located in North West Germany. These are not well known by the general population (they are 'hidden'), but nevertheless hold very important positions in European and global markets; some are even market leaders (they are 'champions').

Key markets of the agricultural technology industry in Lower Saxony are much more global compared to the food industry. Therefore, this project focuses on the globalizing agricultural technology industry. Furthermore, value chains of both industries differ significantly due to relevant product characteristics. The food industry produces perishables for final consumers with specific requirements for freshness, quality and food safety. Their production systems are, therefore, completely different to the ones of the agricultural technology industry which produces equipment and technical appliances being sold to businesses and farmers. In contrast to the food industry, the agricultural technology industry has so far not been intensively discussed in the general public for the damage of the environment (e.g., ground water quality, emissions), negative social impacts of production (e.g., precarious employment) and animal welfare issue.

## 2. Globalizing Value Chains

PORTERS (1980, 1985, and 2011) value chain approach has been a good starting point for an analysis of economic processes at the firm level. For a better understanding of a firm's input-output-structure and related product and marketing strategies, it is important to distinguish between primary and secondary activities. For the selection of strategies, internal resources have to be brought in line with markets requirements (customers) (HART 1995) – to create a „strategic fit“ between them (JELINEK & BURSTEIN 1982). This means, the organization of value chains (choice, arrangement and weighting of primary and secondary activities) has to be balanced with the capabilities and knowledge of a firm. After identification of primary activities, related 'critical success factors' (CSFs) (ROCKART 1982, S. 4) can be named.

Within the global economy, two important trends have been obvious over the last decades. Firstly, an ongoing globalization of production and trade, even though with remarkable interruptions during the crisis 2008/2009 and a still ongoing recovery process (WTO press release, April 2013). Secondly, the vertical disintegration of companies which focus activities on core competencies and outsource peripheral operations (corporate refocusing) (BARNEY ET AL. 2011; LOCKETT & THOMPSON 2001). These trends have laid the basis for a growing number of network arrangements with business relations ranging from ‚arm's length' (both parties are independent and have the same bargaining position) to relationships which require intensive communication (GEREFFI 1999; GEREFFI ET AL. 2005). The question is how these business relations can be governed and organized. WILLIAMSON (1979) distinguishes between Market and Hierarchy as different modes of governance. In addition to this, GEREFFI ET AL. (2005) identify three more types of governance: Modular, Relational and Cap-

tured. US-based food and agricultural value chains are analyzed by GEREFFI ET AL. (2009).

Market represents a type of governance in which clients and suppliers make transactions without dependency. This means, it is a classical 'arm's length' relationships found in many commodity markets. Negotiations are necessary to agree on a price only because products are standardized without unique features. Within modular types of governance components are produced based on specifications provided by the client. The machinery of the supplier is no client specific investment and can be used for different purposes. The relational type of governance is characterized by frequent information exchange and intensive relations, for example, joint research and development with a high degree of dependency between partners. The captive type of governance leaves suppliers with almost no alternative because products and production processes are specified to the exact needs of the client. Hierarchy represents a type of governance in vertically integrated firms.

## 3. The Agricultural Technology Industry in North West Germany

Sales markets of the agricultural technology industry can be found where primary production is developing, namely in rural areas with a high concentration of agricultural production. Industrialization of agriculture has increased since the 1960s in the northwestern part of Germany due to a growing demand for agricultural products (poultry and pigs in particular). This has induced a growing demand for feeding and agricultural machinery, stable equipment, slaughterhouses etc. with significant income effects on the ancillary industry. Subsequently, within decades small family firms have developed into global scale business groupings which are today still family owned. However, food value chains are characterized by power

asymmetries in favor of the retailers. The processing industry demands large, uniform animal batches coming from farms which have grown in size (HANSEN & LUND 2011). In Germany, farm sizes are smaller than in the Netherlands, Belgium, Denmark, Great Britain and in the US. Vertically integrated poultry corporations from Brazil and Thailand are new competitors on the world market. Global corporates (e.g., Smithfield, US based) and financial investors (e.g., Aquila Capital) have increasingly started to finance large animal production units worldwide and push forward the industrialization of global agriculture. Future prospects for the agricultural technology industry are overall positive because of growing international markets and subsidies for agricultural machinery in some emerging economies. However, a potential danger is a growing protection of markets (WIESENDORFER 2012) and, more recently, political destabilizations (e.g., the crisis in Ukraine).

#### **4. Research Design**

The empirical analysis is based on information derived from six in-depth case studies. 51 qualitative interviews with chief executive officers, managing proprietors and executives took place over the period November 2011 to March 2013. In addition to on-site visits, firm documents, internet searches, press releases and so on provide further information.

The empirical phase involved three steps. Firstly, primary activities of each of the six value chains had to be identified. One objective was to get knowledge about important external partners of lead firms which contribute to primary activities of the value chains. Suppliers could be identified as most important partners in all six case studies. The decision was made to focus further investigations on those suppliers which are responsible for 70 % of the lead firm's purchasing volume. Further

considerations concern relevant groups of purchasing products. Secondly, the spatial organization of the supplier network was analyzed before the third and final step focused on the type of governance between suppliers and lead firms.

#### **5. Multi-scalar Networks and their Governance**

The six case study firms have been made anonymous: 'Masterclass' and 'Simply the Best' (stable equipment), 'Take It Home' (greenland harvesting machines), 'Pump It Up' (pump and grinding technology), 'Spread It' (slurry technology) und 'Flour Maker' (mill technology).

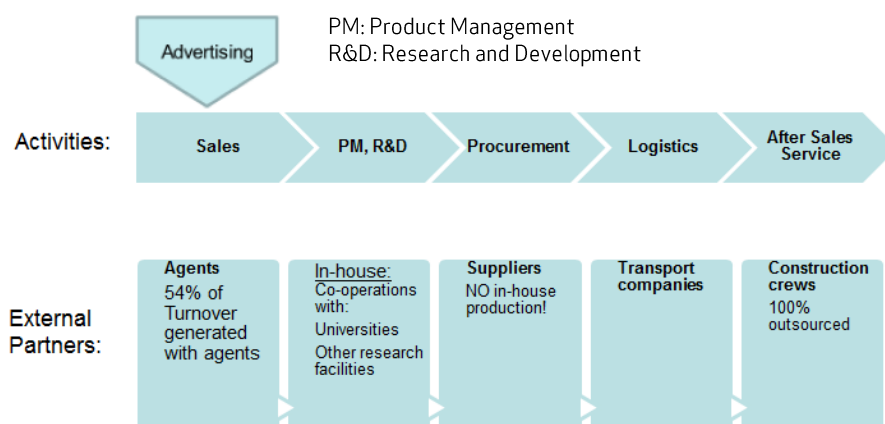
Masterclass develops and sells feeding systems and housing equipment for the pig and poultry production, just as Simply the Best does but exclusively for pigs. Masterclass is a broad global market leader while Simply the Best holds a similar position for the liquid feeding technology. The market is truly global and main competitors are based in North America. However, many competitors registered offices in Europe, primarily in the Netherlands and Germany. It is striking that two main competitors of Masterclass in the domain of pig production are located in close spatial proximity; one of them is Simply the Best. Clients of both firms are mainly farmers and large, vertically integrated meat and egg production companies. Both firms regard themselves as manufacturer of products which allow clients to profitably produce animal-based food based on optimal automation in the barns combined with cost-efficient management practices. Take It Home is a specialist for the development, construction and distribution of machines for greenland harvesting, for example mower conditioners, disc mowers, rotary tedders and rakes, forage (transport) wagons, round balers, large square balers, forage harvesters. Greenland harvesting machines are available for all food

plants which are either put in storage, directly fed or used for biogas production. Pump It Up's core competencies are the production and distribution of rotary pumps, pumping stations, tow hose technology and biogas solutions. Spread It, founded 1892, is very well known for modern slurry technology. Flour Maker, founded 1878, is a milling technology specialist. The company offers the planning, production and assembly of individual components and complete mill facilities. Clients are the mixed fodder industry, storehouses, port cargo businesses and the bulk cargo industry. Other targeted customer groups are producers of wood pellets and edible oils. Complete production and silo facilities of varying size and configurations are sold including machinery components.

The detailed analysis of six value chains examined lead firms' input-output-structure, the spatial organization of production, the governance of relationships and the institutional context. All six case study firms tend to accumulate knowledge in-house while having at the same time a very strong customer focus. The interdependence between both factors has been identified as critical success factor. However, lead firms' input-output-structure and in-house production depth varies

quite significantly. Figure 1 shows, as an illustrative example, the value chain of Masterclass. Masterclass' activities are strongly focused on the sales of stable equipment. The related product management is closely linked to research and development, the buying department, logistics and after sales services. Software developments to use the central control system are seen as a core competence of Masterclass and, therefore, in-house developments are preferred. Meanwhile, the production of physical components is completely outsourced to suppliers. Masterclass' in-house production depth of zero means that all parts are bought from suppliers and assembled on site. This allows Masterclass to flexibly react to business fluctuations and suppliers are left with the challenge to compensate reduced orders by Masterclass; and in situations when sales increase suppliers have to be able to quickly increase their output likewise. Therefore, flexibility is a main requirement for suppliers to establish themselves as an integral part of the supplier network for Masterclass and the others. This finding is in fact true also in value chains with a higher production depth. For Take it Home, for instance, this ability is crucial even more when future developments are evaluated.

**Figure 1:** Value Chain of Masterclass (feeding systems and housing equipment)



**Source:** Own figure (according to Tepe 2015)

The value chain of Simply the Best is completely different to Masterclass even though the firm competes with Masterclass in the domain of pig production. In-house production depth (liquid feeding) is 70 % and over all stable equipment products 25 %. Simply the Best produces pumps, hods, containers, automatic feeding stations (for group sow housing, including ear mark identification), mixing vessels, stirring units and dosing feeders. In addition, weighting machine parts, boards for control boxes and the necessary software are produced in-house. Innovations are driven by a technology-focused customer orientation with production as important element within the value chain. In contrast, Masterclass uses the research and development department as internal service unit where it is important to acquire specific technical and business knowledge about the purchased elements and components to improve the bargaining position with suppliers and negotiate quality issues. Instead, Simply the Best argues that in-house production allows quick reactions to market signals. Other advantages are a higher quality control level, more flexibility with respect to special requests, a better protection of firm-specific know-how and the realization of economies of scale. In-house production depths of Take It home (20 %), Spread It (0 %), Pump It Up (70 %) and Flour Maker (20 %) vary quite significantly, but a direct comparison is difficult due to varying industry activities.

Masterclass and Simply the Best continuously create innovative products for the market, but both firms use different strategies. Both Masterclass and Simply the Best mainly develop new products in reaction to customer needs (adaptive innovations), especially within technologically demanding product groups. In addition, research and development units in both firms transfer scientific knowledge into marketable products. Therefore, research in development is of strategic impor-

tance. However, Masterclass promotes competition between different departments within the firm and external suppliers to provide the most cost-effective (optimal) solution for the market. Instead, strategic partnerships with suppliers are not as important for Simply the Best; innovation processes are internally organized. Short decision-making channels are seen as more relevant to realize optimal market solutions.

Masterclass and Simply the Best differ significantly with respect to size, organizational structure and core competencies. With respect to internationalization, Masterclass is more global than Simply the Best. Simply the Best generates half the turnover through exporting to Europe, South America, Japan, Australia and China. Masterclass is much more globalized with independent distributors and logistic hubs in all global centers of intensive livestock production. The importance of the national market has decreased significantly while global markets have become much more relevant for Masterclass' development. However, international sales markets are important for all six case study firms. Four firms have contractual sales agreements with partners abroad (Masterclass, Simply the Best, Take It Home, Pump It Up). Five firms produce in Germany only and deliver to export markets. Masterclass and Pump It Up organize international sales via subsidiaries while Simply the Best and Take it Home use foreign distributors. Monetary incentives based on sales volumes are offered to agents (foreign distributors or local staff) by Masterclass, Simply The Best, Take It Home and Pump it Up. Spread It and Flour Maker pay sales staff fixed salaries, in both firms the managing owners are heavily involved in the sales processes. Suppliers are often located in close proximity to lead firms or global logistic hubs (Masterclass: Germany, China, the US, Malaysia). Figure 2 shows, as an illustrative example, the supplier network of Simply the Best. Spatial

proximity reduces transport costs and increases flexibility while well-known suppliers are preferred. Contractual agreements between lead firms and suppliers are more important than trust. A diverse supplier network is preferred to avoid power imbalances and (too) strong suppliers. A balance has to be found: Too many suppliers increase the complexity of a supplier network in a negative way, so for some lead firms the challenge is defined by reducing the amount of suppliers without jeopardizing the bargaining position.

**Figure 2:** Supplier Network of Simply the Best (feeding systems and housing equipment)

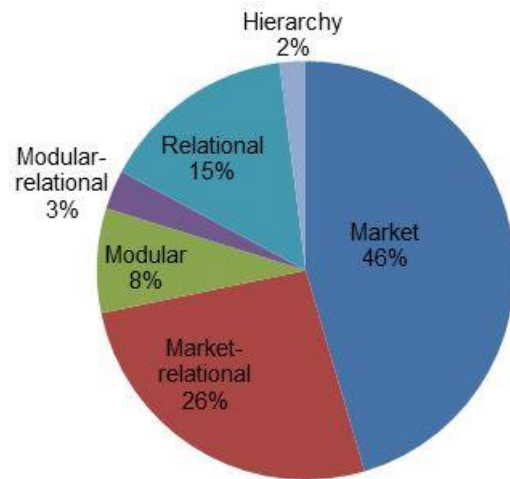


**Source:** Own figure (according to Tepe 2015)

Subsequently, governance between lead firms and suppliers and the spatial organization of relationships are considered. The analyzed lead firms are characterized by huge heterogeneity and different forms of governance. The 'market' is the most commonly used type of governance (Figure 3), followed by 'relational', 'modular' and 'hierarchy'. Two modified types of governance are suggested

based on the empirical analyzes: 'market-relational' and 'modular-relational'. These characterize relationships in which suppliers hold a very high transaction volume with lead firms.

**Figure 3:** Lead-firms' Supplier Networks - Types of Governance in Agricultural Technology



**Source:** Own figure (according to Tepe 2015)

On the one hand, a sudden discontinuation of contracts would have significantly negative impacts on suppliers or could even danger their existence. On the other hand, lead firms benefit from long-term relationships with their suppliers and reliable business relations and knowledge exchanges. Having said this, relevant dependencies between suppliers and lead firms do exist. A maximum transparency with respect to price and a high level of know how protection lead to a preference for individual parts purchases at the 'market' instead of the buying of complete modules. High product quality and logistical flexibility is best realized through long term relationships in spatial proximity. As a result, market-relational and modular-relational types of governance are preferred. A manageable number of suppliers allow the reduction of complexity within the supplier network as well as a high logistical flexibility. A reduced in-house production depth leads to a growing importance of relational suppliers which drive innovation processes along the value chain. Hierarchical suppli-



ers play only a minor role in the six analyzed network configurations; the captive type of governance could not be found at all. Each lead firm has specific resources available, pursues individual goals and strategies which result in a unique combination of governance types in the supplier network: "there is clearly no single way to organize global value chains" (GEREFFI ET AL. 2005).

## 6. Conclusions

The paper described the primary activities of the respective value chains and identified relevant external partners (primarily suppliers) which contribute to processes of value creation in lead firms. Subsequently, the spatial organization of relationships and governance between lead firms and suppliers were considered, from the perspective of the lead firms as well as from the perspective of individual suppliers. The results illustrated the complexity of value chains in the agricultural technology industry and relevant process variables were identified. The analyzed lead firms were characterized by huge heterogeneity. Five companies (Simply the Best, Take it Home, Pump it Up, Spread it, Flour Maker) have a central production unit in North West Germany and no global following has occurred so far. The exception is Masterclass with production units abroad. However, there is no "one size fits all" strategy for successful globalization processes at the firm level. Instead, it is important to match individual strategies with internal resources and existing market opportunities.

The analyzed lead firms prefer long-term relationships with their suppliers and use different types of governance. The 'market' is most commonly used, followed by 'relational', 'modular' and 'hierarchy'. The lower the in-house production depth the more important are relational linkages with suppliers. Two modified types of governance are sug-

gested based on the empirical analyses: 'market-relational' and 'modular-relational'. The location of suppliers in close spatial proximity to lead firms might play a role but is not always necessary.

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