Vertical coordination with growers in the supermarket fresh fruit and vegetables supply chain in Croatia

Vertikale Koordination lokaler Erzeuger in der Supermarkt-Wertschöpfungskette für Frischobst und -gemüse in Kroatien

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Abstract

This paper provides further evidence on vertical coordination as a means of overcoming supply disruptions and improving product quality. In contrast to previous studies, our findings suggest that the leading model of vertical coordination between fruit and vegetables growers and supermarkets in Croatia is restricted to loose, one-year contracts which mainly specify the terms of payment without providing farm assistance. Wholesalers more often provide farm assistance to fruit and vegetables growers. We expect that the wholesalers will drop out of the fresh fruit and vegetables (FFV) supermarket supply chain since supermarkets aim to streamline the procurement system by increasing local procurement directly from the farmers. Thus, the amount of farm assistance provided will further decrease. Therefore, for the rather small Croatian growers to integrate in the FFV supermarket supply chain, it is even more important that they organize to meet the supermarkets' minimum quantity requirements and obtain access to a distribution facility.

Key words

supermarket supply chain; fresh fruits and vegetables; vertical coordination; farm assistance

Zusammenfassung

Diese Studie liefert weitere empirische Evidenz für vertikale Koordination als ein Instrument um sowohl die Produktmenge als auch die Produktqualität in einer Wertschöpfungskette zu verbessern. Unsere Ergebnisse zeigen dass sich die vertikale Koordination zwischen den Obst- und Gemüseproduzenten und den Supermarktketten in den meisten Fällen auf Ein-Jahres-Kontrakte beschränken, die im Wesentlichen die Zahlungsmodalitäten spezifizieren. Jedoch bieten Supermärkte im Unterschied zu Großhändlern den Erzeugern keine zusätzliche Unterstützung (farm assistance) an. Es ist zu erwarten, dass die Großhändler aus der Wertschöpfungskette verdrängt werden, da die Supermärkte Obst und Gemüse in zunehmendem Umfang direkt von den lokalen Erzeugern beschaffen. Somit wird sich das Angebot an farm assistance, das insbesondere für die kleineren Erzeuger wichtig ist, um sich in die Wertschöpfungskette zu integrieren, weiter verringern. Daher wird es für die kleinen kroatischen Erzeuger noch wichtiger, dass sie sich organisieren, um so die Mindestanforderungen der Supermärkte an die Liefermenge zu erfüllen und Zugang zu einem Auslieferungslager (distribution centre) zu bekommen.

Schlüsselwörter

Supermarkt-Wertschöpfungskette; Frischobst und -gemüse; vertikale Koordination; farm assistance

1. Introduction

During the transition process in Central and Eastern Europe (CEE), the retail sector was privatised and relationships along the whole food supply chain – from farmers to retailers – collapsed, implying serious supply disruptions. As reforms progressed, including market liberalisation and the privatisation of formerly state-owned distribution systems, new modes of market coordination mechanisms emerged. In addition, international retailers and processors entered the new markets, introducing their own business models of superior efficiency. Also, international retailers offered products of western quality standards in the supermarkets, thus, strengthening consumers' demand for food of high quality (HANF and PIENIADZ, 2007). Domestic retailers were thus forced to quickly adjust to these new developments to stay in the market. To secure produce of high quality at competitive costs, this required the adoption of higher quality standards and the restructuring of the whole supply chain. Further, to overcome problems of insufficient supply and minor quality, international and domestic retailers, as well as processors, upgraded their vertical coordination mechanisms.

Empirical studies provide evidence that due to transition-specific development and many market failures, highly diversified modes of vertical coordination exist in CEE countries and Central Asia (SWINNEN, 2005; WORLD BANK, 2005).

Transactions exhibiting the lowest degree of coordination are conducted via spot markets, where a transaction is based on a price agreement only. A higher degree of coordination is achieved through vertical coordination by contracting. The highest degree of coordination is achieved by comprehensive vertical coordination, which is called vertical integration, where one firm controls various levels of the value chain, implying that market transactions are replaced by intra-firm transactions. This can be achieved by either forming a subsidiary, or undertaking a merger or an acquisition.

Relatively strong vertical coordination between farmers and retailers within contract farming in the FFV supermarket supply chain in CEE and Central Asia, and especially in Croatia, is observed by REARDON et al. (2003), DRIES et al. (2004) and WORLD BANK (2005).

With these previous empirical findings as our background, this paper aims to identify the current degree of vertical coordination in the FFV supermarket supply chain in Croatia. We conduct interviews based on a questionnaire with *inter alia*, the FFV procurement managers of Croatia's 5 largest supermarket chains. We especially account for the role of farm assistance provided within contract farming.[1]

Contract farming can be defined as a formal or informal contractual agreement between a farmer and a distributor (supermarket) or processor concerning the supply of agricultural products under forward agreements, generally at predetermined prices (EATON and SHEPHERD, 2001). An essential element of contract farming is the provision of some degree of assistance to the farmers, with the aim of increasing supply quantity or quality, or reducing seasonality.

Contracting with farmers may be implemented within a preferred supplier program or an outgrower scheme. In general, farmers qualifying for a preferred supplier program have a long-standing successful business relationship with a supermarket. These farmers are the suppliers from which a supermarket preferably sources its supply and provides some degree of farm assistance. More comprehensive farm assistance is provided within an outgrower scheme in which the farmer provides the land and labour, whereas the processor or distributor has considerable control over the production process by comprehensively providing inputs and extension services.

In general, the aim of farm assistance is to improve farmers' access to basic production factors such as capital and specific inputs, know-how and information (knowledge and experience). In particular, farm assistance may include prepayment to finance the harvest, credit, leasing or rental of farm machinery, bank loan guarantees, quality control and inputs (e.g. seedlings), as well as extension and management advisory services. Farm assistance may be provided within bilateral contracts and complex contract systems. Bilateral contracts are usually agreed upon between the farmer and a processor, or the farmer and an input provider. In contrast, a triangular agreement includes three partners e.g. a farmer, a processor and a bank.

Farm assistance is provided within supplier contracting of the supermarkets in the FFV sector in CEE and Central Asia (WORLD BANK, 2005). REARDON (2003) provides evidence on outgrower schemes in the FFV supermarket supply chain in Croatia. DRIES et al. (2004) present evidence on complex contract systems: the two largest supermarket chains in Croatia guarantee loans for their outgrowers to acquire greenhouses and irrigation. Further, DRIES et al. (2004) report on the acquisition of dedicated wholesalers by large supermarket chains in order to have their own preferred supplier program.

The situation in the FFV supermarket supply chain in Croatia is the result of extremely rapid growth in the retail sector, which is among the fastest in the world. Not until 2001, when foreign retailers first entered the market, did supermarkets begin to offer a broad assortment of FFV in their stores; prior to this, FFV had primarily been sold in the street markets (REARDON et al., 2003). Today, FFV is sold to Croatian consumers mainly through the stores of large national and international supermarket chains. However, a large amount of the supply is secured by imported FFV.

This paper is organised as follows. In the next section we provide an overview on the developments in the FFV retail and wholesale system in Croatia during transition (section 2). The third section presents the main findings from our empirical analysis on vertical coordination mechanisms in this market. The paper concludes by summarising our findings, presenting policy implications and outlining suggestions for further research (section 4).

2. The emergence of the FFV supermarket supply chain during transition[2]

During socialist times (1945-1990), FFV was sold primarily through green markets in towns and urban areas in Croatia (table 1). Municipal governments operated the green markets by leasing stands to farmers to sell their own products. Besides a small assortment of FFV, in particular imported lemons, oranges and bananas, along with non-food items, staples and processed food items were sold by socially-owned enterprise (SOE) retail chains, e.g. Konzum (see section 3.2), representing a new retail format which was created in the 1950s and 1960s. In the early 1980s, some vegetable production "agrokombinats", i.e. large vegetable production and marketing SOEs, established shops to sell their vegetables.

With the breakdown of the socialist system in 1990-91, the "de-socialisation" of the system began. From 1990-1995, the green markets remained the main selling place for FFV to end consumers. The variety of FFV sold has broadened, the quantity has increased and the quality improved, all the result of increasing imports of FFV, particularly from Italy and Spain of tropical fruits originating in Latin America. Still, the privatised SOE retail chains and the numerous, newly established and independent small private retail shops and locally acting retail chains primarily offered non-food items and only tiny, if any, FFV selections.

In the second half of the 1990s, the supermarket sector emerged. The size of local retail chains and retail shops gradually increased and started to penetrate the middle and higher income neighbourhoods in the major cities. Also, the independent, small retail shops started to exit the market and the Agrokombinat-supported FFV retail sector almost completely disappeared. Still, the amount of FFV sold by the supermarkets was still rather low.

In 2001, foreign retailers (e.g. Kaufland, Metro and Mercator) started to enter the Croatian market, thus inducing extremely rapid growth of the supermarket sector. The share of large supermarkets (including supermarkets, hyper-

[1] The data was collected within a study for the World Bank.

[2] This chapter draws heavily on REARDON et al. (2003).

Table 1. Development of the FFV retail sector and FFV wholesale system during transition

	FFV retail sector	FFV wholesale system
Socialist times (before 1991)	• green markets • SOE retail chains • agrokombinats	• informal truck markets
Early post-transition (1991-1995)	• green markets with broadened assortment • small independent retail shops • privatised former SOE retail chains	• informal truck markets serving green markets, and small retail shops and retail chains • traditional wholesalers with outgrower schemes serving green markets and small supermarket chains • few new wholesalers serving regional supermarket chains
Emergence of national supermarkets (1996-2000)	• local retail chains • small independent retail shops • green markets	
Multinationalisation of the retail sector (2001-2003)	• local/national retail chains • foreign retail chains • small independent retail shops • green markets	• dedicated/specialised wholesalers (1. wholesalers with outgrower schemes and 2. wholesalers with own production and outgrower schemes) serving national and international supermarket chains • traditional wholesalers serving local supermarket chains and small retail shops • informal truck market serving green markets and small independent shops

Source: own illustration based on REARDON et al. (2003)

markets and cash & carry stores) in food retail increased from about 25% at the beginning of 2001 to 51% at the end of 2002 (DRIES et al., 2004). This implied that the importance of small retail shops decreased from about 80% of overall retail trade to 45% at the end of 2002. As an example, 4,500 small retail shops were closed in 2002 alone. Also, the importance of green and street markets decreased to 4%. Concurrently, the size of the retailers' supermarket stores increased, and the importance of FFV in the supermarkets' assortment also strengthened. For example, the largest retail chain, Konzum, increased its FFV sales 5.5 times from 2001 to 2003.

Currently (beginning of 2009), FFV is sold to Croatian consumers mainly through the stores of large national and international supermarket chains. According to experts' estimation, the share of FFV sold through supermarkets accounts for approximately 70% of their sales. Roughly 20-25% of FFV is sold on green markets and 5-10% is sold by independent retail shops.

This development was accompanied by dramatic changes in the procurement system of the supermarket chains. In the first half of the 1990s, FFV wholesale markets were, as in socialist times, represented by informal truck markets. Nevertheless, some specialised FFV wholesalers emerged to serve the privatised retail chains, e.g. Konzum. In addition, some regional "traditional wholesalers" with outgrower schemes evolved to supply green markets and small retail store chains. A traditional wholesaler compiles the complete assortment by local and international sourcing, and organises the delivery of products for an individual retail shop or the supermarket chain's shops. For example, Fragaria (see section 3.3) started as an apple supplier and became a general wholesaler with outgrower-management functions.

The rapid entrance of the foreign retail chains in 2001 accelerated the structural change in the procurement system. Supermarkets increasingly broadened their assortment of FFV following a cost leadership strategy. Some supermarkets tried to escape from fierce price competition by following a product differentiation strategy, which increased the quality of FFV offered in the supermarkets. However, the truck market and the traditional wholesale system were characterised by relatively high transaction costs and they could not deliver FFV of the required quality. This induced the emergence of the "specialised/dedicated wholesalers", which exclusively served the large national and international retail chains. Some specialised/dedicated wholesalers sourced the produce within their outgrower schemes and complemented it with imported FFV to increase volume and secure off-season supply. Other specialised/dedicated wholesalers, e.g. Fragaria, had their own production supplemented by their outgrower schemes to increase the volume supplied to the supermarkets.

To increase the quantity and quality, and to decrease the seasonality of local supply, some supermarket chains started to directly assist FFV growers within their preferred supplier programs. For example, Konzum granted investment support by providing loan guarantees or loans for greenhouses and irrigation systems.

Additionally, some of the large retail chains established their own systems of distribution, which allowed them to substantially reduce transaction costs and create a competitive cost advantage.

3. Empirical findings

In this section we present the main findings on vertical coordination in the Croatian FFV market based on interviews conducted in early 2009. We begin by outlining our methodological approach (section 3.1). The next sub-section presents the models of the FFV supermarket supply chain that were identified in the interviews (section 3.2). Furthermore, we describe how the farmers are linked with upstream partners in the FFV supply chain by vertical coordination and explain the role of farm assistance programs that are provided by supermarkets and wholesalers (section 3.3).

Finally, we shed light on the further development of the supermarket FFV supply chain (section 3.4).

3.1 Methodology

This analysis is based on a survey that was realized through semi-structured, in-person interviews. We proceeded in the following manner. First we developed a detailed methodology and fieldwork schedule based on existing studies on supply chains in transition countries, especially in the Croatian FFV (e.g. REARDON et al., 2004; LEAT and VAN BERKUM, 2003; VAN BERKUM, 2005; WORLD BANK, 2005). This included gathering basic information on the actors involved in the FFV supply chain, as well as on the rules of the game, range of services, and constraints hampering vertical coordination. This information allowed us to design a draft questionnaire. Based on a pre-test conducted in the field in Croatia, we refined our methodological approach and redesigned the questionnaire.

Interviews were conducted with the FFV procurement managers of Croatia's five major national and international supermarket chains: Kaufland, Konzum, Mercator, Metro and Spar. Altogether, these chains account for approximately 70% of the FFV supermarket business. Wholesalers, grower cooperatives, individual growers and the national fruit growers association were also interviewed. In addition, representatives from the Croatian Agricultural Extension Institute, the Croatian Bank for Reconstruction and Development, the Croatian Postal Bank and the Ministry of Agriculture were interviewed. The interviews were conducted based on a questionnaire composed of questions regarding 1) the design of the firm's vertical coordination mechanism with its farm suppliers (structure of the firm's farm suppliers, contract design), 2) the farm assistance program (type of assistance provided, eligibility criteria, impact) and 3) the future development of the supermarket FFV supply chain and how this could be fostered by policy measures. The interviews were conducted in January 2009 in both the Croatian and English language. The length of the interviews varied between 1 to 2 hours.

3.2 The structure of the FFV supermarket supply chain

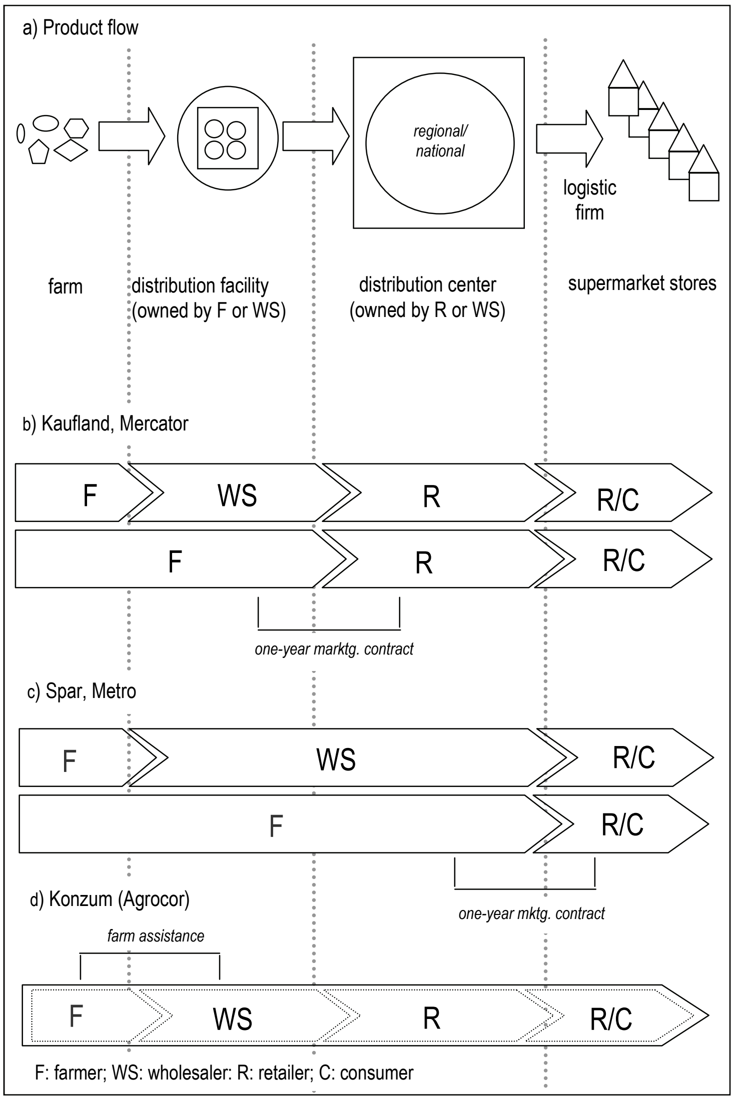
Several models of the supermarket supply chain for FFV in Croatia, from the fruit and vegetable growers via supermarkets to the consumers, currently exist (figure 1).

In general, the product flow is as follows (figure 1a): the harvested fruit and vegetables enter the distribution facility to be washed, sorted, graded and packed. Next, the packed produce is transported to a regional distribution centre, where quality control is generally conducted before the produce is stored in a cooling facility and the individual assortment for the supermarket stores is undertaken. The fruit and vegetable assortments are then distributed to the supermarket stores.

The distribution facility may be owned by a large farmer or farmers' cooperative (F) or a dedicated wholesaler (WS). The regional distribution centre is usually owned by a WS or a retailer (R). It is possible that a large farmer or cooperative delivers the produce directly to a supermarket's stores without entering the distribution centre. Distribution of the fruit and vegetable assortments to the supermarket stores (R/C) is organised by a logistic firm, a supermarket which has an own fleet, or the farmers themselves.

The structure of the FFV supply chain of Kaufland is very similar to Mercator (figure 1b). Kaufland is a German supermarket chain with 22 supermarket stores. Mercator is a Slovenian supermarket with 26 hypermarkets and 11 supermarkets in Croatia. Kaufland, as well as Mercator, organise not only the domestic FFV procurement but also the procurement in foreign countries. Also, both Kaufland and Mercator possess a distribution centre. For both companies, the wholesaler or the farmer owns the distribution facility. The produce may be delivered directly from a FFV grower or a grower cooperative to the retailer's distribution centre, if the farmer is able to deliver a minimum quantity and quality (Kaufland is working directly with fruit farmers possessing at least 10 ha), and has access to a distribution facility. Alternatively, the produce is delivered from the

Figure 1. Structure of the FFV supermarket supply chain in Croatia



Source: own illustration

FFV grower, possibly from a smaller farm, via a wholesaler with a distribution facility, to the supermarket's distribution centre. Thus, smaller farmers deliver to the supermarket's distribution facility via wholesalers, and larger

farmers and cooperatives may deliver to the distribution facility directly. Kaufland transports the FFV assortments from the distribution centre to each store by an external logistics firm, whereas Mercator owns its own fleet.

Metro is a German retailer/wholesaler with 6 cash & carry stores and Spar[3] is an Austrian supermarket chain with 6 hypermarkets in Croatia. The FFV supply chains of Metro and Spar differ slightly to that described above since they do not have their own distribution centres (figure 1c). Instead, Metro utilises one of its wholesalers as its logistical partner, which compiles the assortments for individual stores in its distribution centre and organises transport to the supermarkets. Alternatively, large suppliers might directly deliver to Metro's stores. Similarly, Spar's suppliers directly deliver assortments to the chain's stores. Metro's and Spar's respective FFV departments procure FFV domestically only, and the FFV imports are completely organised by the wholesalers.

Konzum is a national chain which is the largest supermarket chain in Croatia, accounting for about 40% of all FFV sales according to expert estimates. Konzum belongs to Agrokor and owns a distribution facility, but also is in control of 5 distribution centres and 650 supermarkets of various sizes all over Croatia. In addition, Konzum owns fruit and vegetable production facilities. Since the beginning of 2009, the domestic FFV procurement of Konzum has mainly been carried out by Agrofructus, a holding of packing houses and buying stations which is owned by Agrokor. Prior to this, Konzum's domestic procurement was done by dedicated wholesalers that Konzum had acquired some years before. However, Konzum organises the FFV import and is engaged in FFV export as well. Konzum is also the owner of Velpo, a special distributor for hotels and restaurants.

Konzum mainly operates in a fully vertically integrated FFV supply chain, since it has acquired and is still acquiring further individual FFV producers, producer cooperatives and specialised wholesalers which are combined in the holding Agrofructus (figure 1d). Any of the FFV supply chain models given in figures 1b and 1c can be found within Konzum's FFV supply chain, since Konzum procures FFV directly from large farmers or independent wholesalers, which may directly deliver the distribution centres.

3.3 Vertical coordination of retailers with growers

Kaufland, Mercator, Metro and Spar have loose, one-year written marketing contracts with 100% of the FFV growers who directly supply their produce to the supermarkets (figures 1b and 1c). The main element specified in the contract is the payment scheme. A supermarket orders 24-28 hours ahead of product delivery. A FFV grower under contract is expected to deliver the quantity demanded by the supermarket. However, a supermarket is not committed to procuring FFV from the grower under contract, and may source the produce elsewhere. In general, supermarkets pay within 40-60 days, whereas wholesalers' payment may exceed 100 days after product delivery. Also, the investigated supermarkets (with the exception of Konzum) do not engage in any kind of farm assistance, e.g. providing inputs, trade or credit guarantee, machinery rental and technical advice.

In contrast, Konzum has loose one-year contracts with 10% of its suppliers only. Also, Konzum provides farm assistance of varying degrees and kind, which may include the provision of inputs, machinery rental or technical advice, and credits. Konzum distinguishes between 3 types of suppliers, and has the strongest relationships with "A" suppliers, followed by "B" suppliers and "C" suppliers, with whom Konzum works only rarely. Konzum provides the most comprehensive assistance within outgrower schemes and has even acquired some farmers.

Besides Konzum, growers are assisted by wholesalers, which are in fierce competition with supermarkets for the local farmers' supply. Mostly, the wholesalers provide inputs to growers, and in exchange the grower delivers produce during the harvest season.

More comprehensive farm assistance, including the provision of credits, technical advice and machinery rental is given by wholesalers, which serve a domestic niche market or an export market with produce of premium quality[4].

For example, Fragaria is a domestic wholesaler with its own FFV production and input production (e.g. seedlings for strawberries), which serves a niche market in Croatia and also exports produce of premium quality. Fragaria provides comprehensive support to its FFV growers by its own consultants, which provide advice in plant protection and plant technology. Also, apple growers are prepaid 25% of their expected harvest to finance machinery rental and workers required for harvesting. Fragaria may also support its farmers in investments. For example, together with a Swedish FFV importer, Fragaria gives financial support to the establishment of 100 ha of raspberry production, which will be paid back by the farmers in produce within 5 years. Also, the company rents machines required for strawberry production to its farmers, who may pay back the rental fee in produce.

The low importance of farm assistance has several causes. The managers of the supermarkets point out that they do not engage in farm assistance, since the margins in the FFV business are low and thus the profitability of such investments is also low.[5] In addition, fruit and vegetables production in Croatia bears high risks with regard to drought, hail and frost due to missing protection measures, e.g. irrigation systems, hail nets and respective insurance schemes. Further, interviewees point out that the commodity price risk is very high for FFV in Croatia. Due to missing market information systems, the quantities of vegetables supplied, and thus prices, vary substantially between

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3 Spar Croatia is 30% owned by Metro Croatia.

4 This result is in line with BURMA and SARANARK (2006) on the FFV supply chain in Thailand, who found that a supply chain around an export company offers better chances for smallholder involvement than the FFV supermarket supply chain.

5 One interviewee mentioned that a supermarket makes almost no profits by selling FFV, though the FFV department is the most important with regard to supermarkets' attractiveness. Consumers' choice of supermarket is determined, to a high degree, by their preferences for a supermarket's assortment and freshness of FFV.

seasons.[6] A further factor which might explain why supermarkets do not engage in farm assistance is that supermarkets are not fully reliant on the domestic FFV supply. Supermarkets have the option to acquire FFV by imports from foreign countries.

3.4 Future development of the FFV supermarket supply chain

The future development of the Croatian FFV supermarket supply chain is characterised by the increased importance of the supermarkets' domestic procurement directly from the farmers and the decrease of dedicated wholesalers providing general services to supermarkets.

All interviewees belonging to the 5 major supermarkets stated that they plan to further increase domestic procurement. According to interviewees' estimates[7], domestic procurement accounted for 50-70% of all FFV sold through supermarkets in 2008. For example, the share of imported apples of all apples sold in Croatia amounted about 50% in 2007 (MAFWM, 2007; ROBBRECHT, 2004 and 2007).

Mercator, Metro and Spar aim to increase domestic procurement directly from the farmer, which currently accounts for between 60-70% of domestic procurement (not including bananas, citrus and tropical fruits), and to decrease domestic procurement through wholesalers.

Metro and Spar planned to establish a joint distribution centre in September 2009 and to extend their respective FFV departments, including their engagement in FFV import. Thus, the main functions of the wholesalers will be taken over by Metro and Spar themselves.

Konzum has planned to increase sourcing from its own production plants, implying that direct business with other farmers will be reduced. Thus, Konzum aims to mainly procure FFV from its own production and from production under future outgrower schemes, supplemented by the supply of its own wholesaler Agrofructus. Further, Konzum will increasingly engage in the export of FFV[8], and has already started to establish a system of buying stations throughout the neighbouring countries of former Yugoslavia.

The major driving forces of increasing local procurement are consumers' strong preference for freshness, locally produced FFV, and the higher flexibility of domestic compared to international procurement. As an example, vegetables originating in Spain have to be ordered in trucks, and might have to be stored in cooling facilities for some time, whereas vegetables grown in Croatia may be ordered in smaller quantities, do not need to be stored, and therefore the freshness of the products is higher.

These developments will lead to a decreased demand for the general service provided by wholesalers. Therefore, wholesalers will drop out of the supermarket FFV supply chain unless they reorganise or specialise in serving a niche or the export market, e.g. with FFV of premium quality. Since primarily wholesalers provide farm assistance to growers, the importance of farm assistance will further decrease. Outgrower schemes involving comprehensive farm assistance will remain important for Konzum, as will wholesalers engaged in the marketing of premium quality FFV. If Konzum is successful in its export business, Konzum might further extend its outgrower scheme and thus the provision of farm assistance.

One of the major factors hindering increased local procurement in the FFV supermarket supply chain is that the vast majority of FFV is cultivated on orchards smaller than 1 ha[9]. Small farmers do not meet the minimum quantity requirements of the supermarkets, and investment costs of a distribution facility are prohibitively high. Therefore, small farmers remain outside the FFV supermarket supply chain unless they organize themselves.

For small farmers to enter the FFV supermarket supply chain, it is essential that they organise and jointly invest in a distribution facility which allows them to compile assortments of the required quantity.

However, in Croatia the FFV growers' degree of organisation is low. According to the database of the CROATIAN ASSOCIATION OF COOPERATIVES (2009), there are 82 fruit cooperatives, 29 vegetable cooperatives, and 41 fruit and vegetable cooperatives in Croatia. Though, according to an expert's opinion, 98% of the listed cooperatives do not professionally participate in the FFV market.

Past experience with cooperatives in Croatia's FFV sector shows that organising farmers into cooperatives presents particular problems. Cooperatives have a long tradition in Croatia, tracing back to the nineteenth century, but many farmers have had bad experience with cooperatives during the communist era, thus the farmers' willingness to organise in cooperatives is low. There are several examples of cooperatives which failed because their members could not reach a consensus on how to manage the cooperative due to high distrust of each other. Also, some farmers consider a cooperative to be a point of last resort (retreat position) through which they sell when all other marketing channels

6 For example, an interviewee reported that this just recently happened in the case of cabbage. During the previous harvest, the supply of cabbage was low, and thus cabbage prices were high. This induced the farmers to grow a lot of cabbage and thus the supply in the subsequent harvest was high and the price was low.

7 The share of domestic procurement varies depending on the product and the season. For example, bananas and oranges are 100% imported. Apples are imported more in the time period lasting from March until the new harvest starts due to missing cooled storage facilities for domestically produced apples. In general, domestic procurement is higher during summer and lower during winter time. Currently, fruit plantations account for 2.2% and vegetable plantations for 9.3% of total agricultural land (MAFWM, 2007).

8 There is large potential for FFV production in Croatia, which offers excellent opportunities for export to the EU since Croatia's harvest season starts earlier than in most EU countries.

9 There were 304,783 family farms producing fruit in 2003, out of which 13,311 (4.36%) produced fruit with modern technology on plantations. About 44% of the family farms cultivated fruit on orchards and plantations smaller than 1 ha, and 23% between 1 and 3 ha. (MAFWM, 2007). Also, there are 132 legal entities, of which about 90% have fruit plantations of over 10 ha under cultivation. In 2003 in the vegetables sector, there were 138,428 family farms, of which 46% cultivated a production area smaller than 1 ha, and 41% of the size between 1 and 5 ha. Further, there were about 300 legal entities, out of which 42% cultivated more than 30 ha of production area with vegetables (MAFWM, 2007: 101-102). In the meantime, the size of the family farms might have increased to some extent due to a governmental incentive program for investments in orchards.

are exhausted. There are numerous examples of cooperative members who also have individual contracts and business relationships with wholesalers and retailers, and thus directly weaken the negotiation power of their cooperative.

Furthermore, interviewees pointed out that establishing a new cooperative under current market conditions is very difficult in Croatia. The investment costs of a distribution facility are high, and particularly smaller farmers lack business relationships with retailers and have insufficient management knowledge.

4. Conclusions

Previous studies provide evidence that vertical coordination is important in the FFV sector and that FFV contracting is increasing rapidly with the development of a modern retail sector in CEE countries. Studies on the FFV supermarket supply chain in Croatia argue that contracts between suppliers and supermarkets include the provision of farm assistance programs and/or the establishment of outgrower schemes.

The conclusions of our study are different, however. We find that the degree of vertical coordination is rather low in this market. In particular, our findings suggest that the leading model of vertical coordination between FFV growers and supermarkets is restricted to loose, one-year bilateral contracts which mainly specify the terms of payment without providing any kind of farm assistance. An exception to this is the largest Croatian supermarket, Konzum/Agrocor, which has a dominant position in the market and is also vertically integrated with some farmers.

Our findings reveal that dedicated wholesalers are in general more vertically integrated with their supplying fruit and vegetable growers by granting farm assistance. Some specialised wholesalers targeting a domestic niche or the export market provide even more comprehensive farm assistance, thus offering better chances for small farmers to be linked to the modern FFV supply chain.

Also, our results do not confirm the finding of a previous study stating that the largest supermarket chains fully vertically integrate with dedicated wholesalers through acquisition to have their own preferred supplier programs. According to our results, this holds for Konzum only, and other large supermarket chains in Croatia have not acquired dedicated wholesalers. Instead, large supermarket chains and the dedicated wholesalers are in fierce competition for obtaining produce from the FFV growers. Our findings suggest that in the future it can be expected that the wholesalers drop out of the FFV supermarket supply chain unless they specialise in a niche or the export market. Since wholesalers are also supplied by smaller farmers, the displacement of wholesalers implies that the share of smaller farmers in the FFV supermarket supply chain will decrease further if smallholder supermarket supply chain participation is not especially promoted.

Supermarkets seem to have a strong interest in further increasing the local procurement of FFV, especially directly from larger farmers. One of the major factors hindering this development is that the vast majority of FFV is cultivated on orchards and plantations smaller than 1 ha. For FFV producers to directly link to the supermarkets, they need to a) meet the minimum quality and quantity requirements, and b) have access to a distribution facility. Smaller farmers generally do not meet these requirements and, therefore, have to supply their produce via wholesalers to supermarkets, implying that a part of the margin is attributed to the middleman and reducing the farmer's revenue.

To foster the further development of the FFV sector in Croatia, we encourage the Croatian government, the European Commission and international lenders to promote the organisation of farmers and their joint investment in a distribution facility. Therefore, the Croatian government should create a legal framework for producers to organise not only in cooperatives, but also in more hierarchical grower organisations.

The European Commission could best foster the organisation of FFV growers in Croatia by speeding up the process for Croatia to become a member of the EU. First, this would put additional pressure on Croatian FFV growers to overcome their distaste to organise since the EU market organisation for FFV allows financial support to be attributed to FFV growers only through grower organisations. Also, since EU legislation allows farmers to organise beyond a cooperative in producer organisations according to EU regulation 2200/96, EU accession puts pressure on the Croatian government to create a legal framework for producer organisations.

If the aim is to keep even smaller farmers in the FFV supermarket supply chain, then investments of organised FFV growers in a distribution facility, which is the primary bottleneck, should be supported financially by e.g. credit guarantees or the provision of investment funds.

Since the access of exporters from Italy and Spain to the Croatian market will improve even more when Croatia becomes a member of the EU, in the interim it is important that a competitive local procurement and logistic system be established to integrate local farmers in the modern supply chain.

Also, technical assistance should be provided to the FFV growers regarding managing production and commodity price risk. The insufficient availability and affordability of efficient risk sharing instruments in Croatia restrict efficient risk management and generate a highly uncertain business environment. There is a high potential for upgrading the currently offered agricultural insurance in Croatia, particularly concerning vegetable production and greenhouse insurance. To tackle this issue, the Croatian Agricultural Extension Service should provide education and advisory support to the fruit and vegetable growers. By lowering production risk, FFV growers might become more attractive for supermarkets that provide farm assistance programs.

In future research it should be more comprehensively investigated why farm assistance provided in the FFV sector is particularly low, and is significantly lower than in other sectors, e.g. in the Croatian sugar or grain sectors. This analysis should also take into account the role of governmental market interventions in the different sectors and the importance of production and price risk.

Our conclusion should be further tested by investigating vertical coordination in the FFV supply chain in other former Yugoslavian countries, especially Serbia and Macedonia, which, like Croatia, have excellent FFV production conditions.

Also, the features of a suitable model for a FFV producer organisation, which especially accounts for the situation in the FFV sector in Croatia, should be defined in more detail based on the experiences gained in existing cooperatives and pilot projects. For example, growers could be organised in a producer organisation which has an established, successful wholesaler as one of its members. This would increase the chance of the producer organisation being successful since the wholesaler's existing relationships with supermarkets, as well as knowledge of management issues, can be utilised and credibility vis-à-vis bank loans might be higher.

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