

**Finance Through Food and Commodity
Value Chains
in a Globalized Economy**

Johan F.M. SWINNEN and Miet MAERTENS
LICOS Centre for Institutions and Economic Performance
& Department of Economics, K.U.Leuven, Belgium
Draft as of 20th October 2010*

**Prepared for the KfW Financial Sector Development Symposium
2010
“Finance For Food –
Towards New Agricultural and Rural Finance”**

*A final version of this paper will be published in the Symposium proceedings

Finance Through Food and Commodity Value Chains in a Globalized Economy

Johan F.M. SWINNEN and Miet MAERTENS

Introduction

The growth of value chains and the associated spread of quality standards has triggered a vigorous debate in the development community on the effects on poor producers in developing countries.¹ Quality requirements in value chains affect farms through several channels. First, increasing public quality requirements in richer countries are also imposed on imports and consequently have an impact on producers and traders in exporting nations (Jaffee and Henson, 2005; Unnevehr, 2000). Second, global value chains are playing an increasingly important role in world food markets and the growth of these, often vertically coordinated, marketing channels is associated with increasing quality standards (Swinnen, 2007). For example, modern retailing companies increasingly dominate international and local markets in fruits and vegetables, including those in many poorer countries, and have begun to set standards for food quality and safety in this sector wherever they are doing business (Dolan and Humphrey, 2000; Henson et al., 2000). Third, rising investment in processing and retailing in developing countries also has induced demand for higher value and higher quality standards commodities from local producers in order to serve the high-end income consumers in the domestic economy or to minimize transaction costs in their regional distribution and supply chains (Dries et al., 2004; Reardon et al., 2003).

The development implications and the impact for small farmers has been actively debated. On the one hand, agriculture in developing countries, and exports of agricultural commodities, are seen as a very important potential source of pro-poor growth (World Development Report, 2008). On the other hand, tightening food safety and quality standards, both from private and public sources, strongly affect domestic and international trade and value chains (Jaffee and Henson, 2004). Some have argued that they are reinforcing global inequality and poverty as (a) they are

¹ The arguments and empirical evidence in this paper cover areas which are traditionally referred to as “developing countries”, “transition countries” and “emerging countries”. Many of the arguments are valid across these regions; where not, the differences will be specifically identified.

introducing new (non-tariff) barriers to trade, (b) they are excluding small, poorly informed, and weakly capitalized producers from participating in these high quality supply systems, and (c) because large and often multinational companies are extracting all the surplus through their bargaining power within the chains (Augier et al., 2005; Reardon and Berdegué, 2002; Unnevehr, 2000; Warning and Key, 2002).

A key concern is that the process of vertical coordination will exclude a large share of farms, and in particular small farmers. Three reasons are mentioned for this. First, transaction costs favor larger farms in supply chains, since it is easier for companies to contract with a few large farms than with many small ones. Second, when some amount of investment is needed in order to contract with companies or to supply high value produce, small farms are often more constrained in their financial means for making necessary investments. Third, small farms typically require more assistance from the company per unit of output. The concern of the exclusion of small farmers is voiced often and raised in many studies on the impact of the growth of high value chains, which has often emphasized the shift to larger preferred suppliers and the exclusion of small farms (e.g. Reardon et al., 1999; Reardon and Barrett, 2000).

However, there is considerable debate and uncertainty on the validity of these arguments, and more generally on the welfare implications of high value chains (Swinnen, 2007). First, while quality and safety standards indeed make production more costly, at the same time they reduce transaction costs in trade, both domestic and internationally (Henson and Jaffee, 2007). In other words, besides barriers, standards can also be catalysts for trade (Maertens and Swinnen, 2010). Second, recent empirical studies show that smallholder participation in global value chains is much more widespread than initially argued and that the situation is actually very diverse – see further in this paper for references. Small farmers are dominant participants in modern value chains in countries and sectors as diverse as domestic horticultural value chains in Asia (e.g. China), cotton chains in Central Asia (e.g. Kazakhstan), horticultural exports from Africa (e.g. Madagascar) and various value chains (dairy, barley, ...) in Eastern Europe (e.g. Poland). There are also cases where farm structures in modern value chains are mixed, for example in vegetable exports from Eastern Africa (e.g. Senegal); or where large farms dominate, such as in F&V value chains in Southern and Eastern Africa and grains and oilseeds in the former Soviet Union (e.g. Russia and Kazakhstan). Recent evidence also shows that important changes may occur over time within a chain, but the direction is equally diverse: small farmer participation declined in some cases (horticultural exports in Senegal) and increased in some other cases (tea in Sri Lanka).

There is less evidence on the third issue, which is the rent distribution within these value chains. Empirically, most studies have focused on the exclusion issue and very few studies actually measure welfare, income or poverty. The few studies that do measure welfare effects find positive effects for poor households in developing countries who may participate either as smallholder producers or through wage employment on larger farming companies (Maertens and Swinnen, 2009; Maertens et al., 2009; Minten et al., 2009). What is remarkable is that these strong benefits occur in several of these cases despite the fact that smallholders and rural workers face monopsonistic processing, trading and retail companies.

A key factor is that the introduction of higher quality requirements has coincided with the growth of contracting value chain finance² and technology transfer (Dries et al. 2009; Miller and Jones 2010, Quires 2007; Swinnen 2007). Contracts for quality production with local suppliers in developing countries not only specify conditions for delivery and production processes but also include the provision of inputs, credit, technology, management advice etc. (Minten et al., 2007; World Bank, 2005). The latter are particularly important for local suppliers who face important local factor market imperfections – another key characteristic. In particular imperfections in credit and technology markets are typically large, which implies major constraints for investments required for quality upgrading, especially for local firms and households who cannot source from international capital markets. However, the enforcement of contracts for quality production and value chain finance is difficult in developing countries which are often characterized by poorly functioning enforcement institutions. These enforcement problems can add significantly to the cost of contracting and may prevent actual contracting to take place and value chain financing.

The paper is organized as follows. The first part discusses the development of value chains and the inclusion of small farmers. The second part discusses the development of value chain finance within these value chains.

Increased importance of value chains

The growth of value chains in emerging and developing countries is related to two factors: (1) the growth of demand for high value products in local markets and (2) increased exports of high-value commodities to high-income countries.

First, domestic consumption of high-value crops such as fruits and vegetables in developing countries increased with 200% in the period 1980-2005, while

² See also for interesting reports on value chain financing.

consumption of cereals stagnated in that period (World Bank, 2008). This growth relates to increasing incomes and urbanization and is reflected in the rapid growth of modern food industries and retail chains (“supermarkets”) in urban market segments (Gulati et al., 2007; Reardon et al., 2003). Modern retail companies have expanded rapidly throughout the developing world and have set high standards for food quality and safety (Dolan and Humphrey, 2000; Henson et al., 2000). Important factors behind the spread of modern food industries have been liberalized investment policies and the associated inflow of Foreign Direct Investment (FDI) in developing country food sectors. FDI stocks expanded from less than 10% of GDP in the early 1990s in most developing and emerging countries to 25% in 2005 in Southeast Asia and the transition countries, and 30% in Africa and Latin-America (UNCTAD, 2010). In the majority of African countries the agri-food sector accounts for a vast share of FDI inflows (UNCTAD, 2010).

Second, high-value food exports – including fruits and vegetables, meat and milk products, and fish and seafood products – from developing countries increased with more than 300% in the period 1980-2005 and now constitute more than 40% of total developing country agri-food exports (World Bank, 2008). The growth in high-value agricultural export products from developing countries has been much faster than the growth in traditional tropical exports such as coffee, cocoa and tea, which decreased in overall importance (Figure 1). For Asia the shift towards non-traditional and high-value exports started earlier, but for Africa and for Latin America and the Caribbean the decreasing importance of traditional crops and the growth in fruits and vegetable exports took mainly place over the past two decades.

These non-traditional exports mainly concern products such as fruits, vegetables, flowers, fish and seafood, that are consumed in fresh or processed form and for which the value (per weight or per unit) is typically much higher than for more bulky primary commodities destined for further processing such as the typical tropical products. In Africa, the exports of fruits and vegetables has increased from 1.9 billion USD in 1990 to 5.6 billion USD in 2007 (FAOSTAT, 2010). Several African countries; including very poor countries such as Côte d’Ivoire, Ethiopia, and Senegal have become important suppliers of fresh fruits and vegetables to EU markets. Similarly, several poor Latin American countries (Guatemala, Honduras, Bolivia) have successfully increased their exports of fresh vegetables to the US.

The importance of this shift from traditional to non-traditional export commodities is twofold. First, many developing countries have for decades been highly dependent on one or just a few export commodities, which has made countries vulnerable e.g. to volatilities and shocks in world market prices. The shift towards non-

traditional exports implies more diversified export portfolios, which reduces these vulnerabilities. Second, non-traditional exports are high-value products for which the value per unit or per weight is much higher as compared to typical traditional tropical exports such as coffee, tea and cocoa. This creates opportunities for rural income mobility and poverty reduction among smallholder producers in these countries.

Organization and structure

The shift towards high-value agriculture is accompanied by a thorough transformation of the agri-food sector. This restructuring or “modernization” of the supply chain includes (1) the increasing number and stringency of standards - both public and private - for quality and safety; (2) a shift from a fragmented sector to consolidation in the chain (mostly at the level of processing, distribution and/or retail); (3) a shift from spot markets transactions in traditional wholesale markets to increasing levels of vertical coordination, including value chain finance. These structural changes have important implications for the participation of small farmers and the distribution of the benefits,

Increasing public and private standards

During the past decade standards, including public regulations as well as private corporate standards, have increased sharply, especially for non-traditional export products such as fresh fruits and vegetables and seafood that are easily perishable. Fresh food exports to the EU for example have to satisfy a series of stringent public requirements; including marketing standards, labeling requirements, conditions concerning contamination in food, general hygiene rules and traceability requirements. In addition, private standards, focusing on food quality and safety, organic production or fair trade, are increasingly established by large food companies, supermarkets chains and NGOs and play an increasingly important role in agro-food trade (Jaffee and Henson, 2005). The demand for higher food standards changed the way of doing business along the food chain (Kinsey, 2003).

Public and private food standards have often been mentioned to act as barriers for developing countries’ food exports, but it is remarkable that many poor countries experienced accelerated growth in fresh produce exports to high-income countries exactly during a period of sharply increased food quality and safety standards. For example, between 1997 and 2006, horticultural exports from Senegal increased fivefold (Maertens et al., 2010), while the number of new SPS-measures which were notified to the WTO increased sixfold over the same period (Henson, 2006).

Increasing consolidation in processing and retail

Consolidation is taking place in the food industry, both in high income countries and in emerging economies. Most of this process is through mergers and acquisitions, and it applies both to food processing and retail companies (Dobson et al., 2003; McCorriston, 2006; Messinger and Narasimhan, 1995). Large food companies are also increasingly spreading globally, through foreign direct investments. In this way they contribute to concentration outside their home markets (Clarke et al., 2002).

In many European transition countries, the five-firm concentration ratio in food retail is already high, above 60 percent in many countries. For example, the top five supermarkets in Bulgaria, Romania and Poland represented respectively 59%, 61% and 57% of supermarket sales in 2009. In most of South America, East Asia (outside China), and South Africa the average share of supermarkets in food retail went from only 10% – 20% in 1990 to 50% – 60% by the early 2000s (Reardon et al., 2003). Also food processing and exporting has become increasingly consolidated. For example, in Senegal, the number of exporting firms of green bean reduced from 27 in 2002 to 14 in 2008 (Maertens et al., 2010).

Vertical coordination and value chain finance

The move towards value chains with increasingly stringent standards has led to changes in the organization of supply chains. Rather than being based on spot market transactions, value chains entail varying levels of vertical coordination at different nodes in the chains.³ First, at the production level contracting and vertical

³ A 2005 comparative study by the World Bank on Eastern Europe and Central Asia came to the conclusion that such vertical coordination programs were important in transition countries for several commodities, and growing (World Bank, 2005; Swinnen, 2006). The study concluded that, for example, in the *dairy* sector, extensive production contracts have developed between dairy processors and farms, including the provision of credit, investment loans, animal feed, extension services, bank loan guarantees, etc. In the *sugar* sector, marketing agreements are widespread, but also more extensive contracts, including also input provisions, investment loan assistance, etc. In both the dairy and sugar sectors, the extent of supplier assistance by processors also goes considerably beyond some of the trade credit and input assistance provided by agribusiness to farms in some developing countries. In *cotton*, cotton gins typically contract farms to supply seed cotton and provides them with a variety of inputs. This model, which is common in Central Asia, resembles that of the gin supply chain structure in developing countries, such as in Africa. However, the extent of contracting and supplier assistance seems to be more extensive in Central Asia, with credit, seeds, irrigation, fertilizer, etc. being provided by the gins. In *fresh fruits and vegetables*, the rapid growth of modern retail chains with high demands on quality and timeliness of delivery is changing the supply chains. New supplier contracting, which is developing rapidly as part of these retail investments, include farm assistance programs, which are more extensive than typically observed in Western markets. They resemble those in emerging economies, but appear more complex in several cases. Finally, in *grains* there is extensive and full vertical integration in Russia and Kazakhstan, where large agro-holdings and grain trading companies own several large grain farms in some of the best grain producing regions.

coordination has grown strongly in some of the high-value supply chains in Latin-America, Asia, Europe and Africa (Dirven, 2006; Gulati et al 2007, Reardon et al., 2009; Swinnen, 2006; 2007; World Bank, 2005). Part of these vertical coordination initiatives include the provision of farm assistance programs to the farms. These farm assistance programs include a variety of measures, such as finance, transportation, physical inputs, and quality control. However also investment loans and bank loan guarantees are provided in several cases.

Rising again food standards are increasingly associated with a shift towards even more extreme levels of vertical coordination in upstream processing and trading. Large exporters increasingly engage in fully vertically integrated estate production where wage laborers are hired to work on large-scale plantations (Minot and Ngigi, 2004; Danielou and Ravry, 2005; Maertens and Swinnen, 2009; Maertens et al., 2010).

Second, also downstream vertical coordination is increasing, which is apparent in vertical relationships between global retailing and food import companies and overseas suppliers. Most African fruit and vegetable exporters, for example, have ex ante-agreements with European importers before the start of the season. Some of these agreements are oral and do not include binding specifications in terms of prices or delivery dates. Yet, most large exporters increasingly engage in more binding contracts with buyers, including a (minimum) price, quantity and timing of delivery. Some exporting firms even receive pre-financing from their overseas partners (Maertens et al., 2007).

Small farmer participation in value chains

The early claims on the exclusion of small farms from value chains were based on limited empirical evidence. New empirical evidence from a variety of countries show a largely consistent and much more nuanced picture. The studies generally confirm the main hypotheses that transaction costs and investment constraints are a serious consideration in these chains and that processing and retailing companies express a preference for working with relatively fewer, larger, and modern suppliers. However, empirical observations also show a very mixed picture of actual participation in value chains, with much more small farms being contracted than claimed initially.

In India small farmers play an important role as suppliers in growing modern value chains (Gulati et al. 2007). In China, production in the rapidly growing vegetable chains (and in many other commodities) is exclusively based on small farmer production (Wang et al. 2009). Surveys in Poland, Romania and CIS find no evidence

that small farmers had been excluded in developing supply chains (Dries and Swinnen, 2004; van Berkum, 2005). In the CIS, the vast majority of companies had the same or more small suppliers in 2003 than in 1997 (White and Gorton, 2005). Studies on high value export vegetable chains in Africa find in some cases that production is fully organized in small farms (Legge et al, 2006; Minten et al., 2009) or fully in large farms (Maertens et al., 2008) or mixed in small and large farms (Jaffee, 2003; Maertens and Swinnen, 2009). This is summarized for a selection of countries in Table 1.

Hence, the recent literature shows that small farmers are indeed “excluded” in some value chains and in some countries, but that this is far from a general pattern, and that small and poor farms are included in value chains to a much greater extent than expected ex ante based on arguments of transaction costs and capacity constraints.

Some studies show there is variation in the nature of contracts going to different farm structures. Often, supplier programs including value chain finances differ to address the characteristics of these varying farms. For example, in case studies of dairy processors investment support for larger farms include leasing arrangements for on-farm equipment, while assistance programs for smaller dairy farms include investments in collection units with micro-refrigeration units (World Bank, 2005).

Some studies find that within the “small farm” group it is the (relatively) richest and most educated that are included and that the poorest are being excluded (e.g. Maertens and Swinnen, 2009; Neven et al., 2009). However, even this is clearly not a general conclusion. Other studies show that the poorest may be included, and some countries (e.g. China horticulture) even show that the “horticultural revolution” (associated with simultaneous dramatic growth of modern retail investments and urban demand for horticultural products) is associated with a pro-poor bias in the supply chain (Wang et al., 2009).

Small farmer inclusion and governance

An important aspect of the growth of modern value chains is the governance and industrial organization of these supply chains. In particular, as already mentioned earlier, there is much evidence that vertical coordination is widespread in high value chains, often as an institutional response to overcome problems of local market imperfections. With investors and food companies facing important problems of sourcing high quality produce on the supply side and high consumer standards on the demand side, vertically coordinated systems have emerged to control standards by suppliers and to provide suppliers with inputs and management advice. Vertical

coordination varies from integrated (large) farms managed by food companies to extensive contracting arrangements with smallholders.

The rise of contracting, far from leading to the exclusion of poorer farmers, is shown to improve access to credit, technology and quality inputs for poor, small farmers that heretofore were faced with binding liquidity and information constraints due to poorly developed input markets (Key and Runsten, 1999). Studies have found extensive evidence of input provision through interlinked contracts – in the form of inputs, credit, bank loan assistance, technology and management advice, etc. – in modern value chains; e.g. for vegetable exports from Senegal, Madagascar and Kenya (Jaffee, 2003; Maertens and Swinnen, 2006; Minten et al., 2007); for diverse agri-food chains in Armenia, Georgia, Moldova, Ukraine and Russia (White and Gorton, 2005); for cotton supply chains in Central Asia (Sadler, 2005); for dairy supply chains in Poland and Bulgaria (Dries and Noev, 2005; Dries and Swinnen, 2004); for horticulture and other food supply chains in Latin America (Dirven, 1996); etc.

Minten et al. (2009) and Maertens and Swinnen (2009) find that due to increased vertical coordination in newly emerging value chains between buyers and poor, small farmers in African countries, such as Madagascar and Senegal, poor rural households experienced measurable gains from supplying high standard horticulture commodities to global retail chains.

However, this is not always the case. For example, in China Wang et al. (2009) found that while rising urban incomes and emergence of a relatively wealthy middle class were associated with an enormous rise in the demand for fruits and vegetables, almost all of the increased supply was being produced by small, relatively poor farmers that sell to small, relatively poor traders. Despite sharp shifts in the downstream segment of the food chain towards modern retailing (e.g., there has been a rapid increase in the share of food purchased by urban consumers in supermarkets, convenience stores and restaurants), modern marketing chains have almost zero penetration to the farm level.

In general, a wide variety of models of value chain development have emerged, with variations both across countries and across sectors, reflecting different commodity and market characteristics, resource constraints etc. For example, in parts of Africa where access to land is ample and easy, large scale farms have been set up in some cases. In other cases, where land is already used by smallholders and land pressure is strong, contracting systems have been set up. Comparative advantage of small versus large farming systems, associated with different types of commodities – such as extensive grain growing versus intensive high quality vegetable production systems – have also led to different chain models.

In the rest of this paper we document and explain these changes and the models that have emerged.

Value chain finance⁴

The provision of credit within state-controlled supply chains was widespread in the 1960s and 1970s. This was most extreme in the Communist system where production at various stages and the exchange of outputs and inputs, including credit and finance, along the chain was coordinated and determined by the central command system (Rozelle and Swinnen, 2004). Also in other regions government marketing organizations and parastatal processing companies often provided credit to their suppliers. The dominant form of state-controlled VCF was that of seasonal credit provisions to small farmers in return for supplies of primary produce (Poulton et al., 1998). In fact, state-controlled VCF was often the only source of credit (and other inputs) for peasant farmers (IFAD, 2003).

This system of state-controlled supply chains and VCF has undergone tremendous changes during a period of reform in the 1980s and the 1990s. In the transition world, the liberalization of exchange and prices, and the privatization of farms and enterprises caused major disruptions in the chain and in credit supply for farms (Swinnen and Gow, 1999). During the period of transition, many farms faced serious constraints in accessing finance. Also in many developing countries privatization and market liberalization led to a sharp decline in the supply of credit and inputs to farms as it disrupted the working of various government-controlled agricultural institutions, cooperative unions and parastatal processing companies (IFAD, 2003). As government marketing boards and cooperatives have ceased to play a major role in the procurement of agricultural produce, so has the provision of credit through state-controlled VCF. In addition, market liberalization led to a decline in government (subsidized) credit to the agricultural sector (Kherallah et al. 2002; Rozelle and Swinnen, 2006).

Following privatization and liberalization, new forms of VCF have emerged and are growing (Swinnen, 2007; World Bank, 2005). These are no longer state-controlled but are introduced by private companies. Private traders, retailers, agribusinesses and food processing companies increasingly contract with farms and rural households to

⁴ See Miller and Jones (2010), van Empel (2010), Winn et al (2009) for excellent recent reports on the importance of value chain finance and reviews of different cases, models and applications; and Kloeppinger-Todd, R. and M. Sharma (2010) for a review of innovations in rural and agricultural finance.

whom they provide credit and financial services in return for guaranteed and quality supplies.

Farmers face financial constraints and constraints in accessing inputs because of imperfections in rural credit and input markets. Private contract-farming schemes are primarily set up by processors, traders, retailers and input suppliers as a private institutional response to these constraints.

Table 2, based on surveys, shows that for small cotton farmers in Kazakhstan access to credit is by far the most important reason to enter into contracts with cotton gins. Similarly, for small vegetable farmers in Madagascar and Senegal, access to credit, in the form of cash credit as well as in the form of pre-financed inputs, is a very important motivation to sign contracts with exporters.

For VCF to function, the downstream company offering finance itself needs sufficient funds and cash flow to finance an VCF system. Initiators of VCF programs often include foreign investors (who have access to more financial means because they have “deep pockets” or because they can access financial markets internationally), or companies who have financial resources from activities in other sectors (and who are interested in investing these funds in the food sector, such as financial-industrial groups in Russia), or domestic processors and traders who sell on the international market (and have thus sufficient financial liquidity, such as grain traders in Kazakhstan); or domestic processors who have links with the international finance through VCF themselves (such as cotton gins in Central Asia who receive pre-financing through contracts with international cotton traders) (Swinnen, 2005).

Models of private sector VCF

Different models of private sector VCF exist. Sometimes different models of SCF develop because processors themselves do not have access to finance. For example, the Ukraine oilseed sector in the 1990s, farms preferred to sell oilseeds to trading firms through barter contracts against inputs, such as agricultural machinery and fuel oil, rather than to crushers. Because processors (crushers) had poor access to credit, traders, equipment suppliers and even banks procured seeds for the oilseed crushing factories. Many farms also retained ownership of their product, leaving the crushing plants in their role of subcontractors, who charged a tolling fee for processing seeds. In 1999, around 80% of the crushers throughput of sunflower seeds was based on a tolling basis. Under the tolling system, crushers received 13-20% of the oilseeds delivered to them as their toll payment for crushing. The oil obtained from the rest was returned to the owners (equipment suppliers, farmers, or traders), who sold the oil

either in the domestic market (competing with the crushers) or exported it (EBRD, 2002).

Alternatively, if domestic sources of finance are lacking, with tradable commodities foreign traders may provide the necessary finance for the whole chain. For example, in the Kazak cotton chain, forward contracting between domestic processors (cotton gins) and international cotton traders provided the gins with financial means to pre-finance the farms' inputs (Sadler, 2004).⁵ Hence the gins received themselves VCF from the international traders which they then used to finance their own VCF schemes with cotton farms. However, more generally, one can distinguish several "classes" of SCF.

Trade credit

In its most simple form, VCF comes down to credit supplied by traders and middlemen. Trade credit usually involves short-term seasonal loans, in cash or in-kind, generally between agricultural producers and produce buyers (or input suppliers). These type of trade-credit relations often do not involve a purchasing agreement and the farmer is free to sell his produce to other buyers as long as he can pay off his debt. However, crops are used as collateral and in case of default the trader/middlemen cashes in on the standing or harvested crops as loan repayment. The provision of credit through middlemen and small traders is mostly informal and often based on social and personalized trade relations (Minten and Fafchamps, 1997). In addition, the relationship between the farmers and providers of trade credit is often more temporary and price-driven – resulting in higher interest rates – than in the case of more complex forms of VCF such as contract-farming (Fries and Akin, 2004).

Interlinked contract-farming

The dominant type of VCF is that of contract-farming, in which the provision of credit is linked to a purchasing agreement for agricultural produce. This was also the dominant type of state-controlled VCF: seasonal credit and input provisions to farmers by (para)-state processing units and government marketing boards in return for supplies of primary produce

Also private sector VCF mostly includes the provision of cash credit or agricultural inputs directly to farmers for which payment is accounted for at the time of

⁵ The resulting ownership structure is the opposite to that in the US or Australia, as the Central Asian farms, mostly small farms that have limited access to finance, sell the cotton to gins while in the US and Australia farms maintain ownership of the cotton throughout the chain, and gins are paid as service providers.

delivery of the product. These basic forms of VCF have been studied in the earlier development literature on interlinked market transactions⁶ and have been described as transactions in which credit and output markets are interlinked (e.g. Bardhan, 1989; Srinivasan, 1989; Bell and Srinivasan, 1989). They are also the essence of various outgrower schemes, which are widely documented (see e.g. Table 1)

However, much more complex forms of contract-farming and VCF are emerging. Apart from transactions in credit and output markets, contract-farming increasingly also includes the provision of extension services, technical and managerial assistance, quality control, transport and specialized storage services to farmers. Moreover, several food companies, e.g. in Eastern Europe and the Former Soviet Unions provide medium term investment loans, investment assistance programs and machinery procurement systems to farmers (Dries et al 2009; Fosth 1999).

Loan guarantee programs

Triangular structures were used by processors and retailers in Eastern Europe to draw on in financial institutions, resources and administrative capacities. Examples of this are processor or retailers who provide loan guarantees to financial institutions for loans to their suppliers (farmers). The underwriting is for specific loans, related to the contract, and restricted for contracting suppliers. Loan guarantee programs within triangular contracting structures were implemented, for example, by sugar processors in Slovakia (Gow et al, 2000), by retailers in Croatia for F&V supplier investments in greenhouses and irrigation (Reardon et al, 2003), and by dairy processors in several countries (Dries and Swinnen, 2004).

Special purpose vehicles

An even more complex form of indirect VCF, where both input suppliers and processors are included, is the use of so-called “special purpose vehicles (SPVs)”. A SPV is a stand-alone company jointly owned by the processor, input providers, and a project financed by the bank. The contract between the SPV and the farms can include provisions on output, inputs, and credit.

⁶ Bell and Srinivasan (1989) define interlinked market transactions as a transaction in which the parties trade in at least two markets on the conditions that the terms of all trade between them are jointly determined. Interlinked market transactions always include an element of credit as they involve exchange of current for future claims. Apart from interlinked credit and output transactions, interlinked transactions also exists in land markets (landlord who provide tenants working capital) and in labor market (employers who give advances to laborers in return for a claim on their labor in peak labor demand periods).

An important advantage of such institution is that the partners in the SPV now share the risk of contract breach. When a processing company by itself implements input and investment facilitation programs, the processor carries the entire risk of farms' breaching contracts, although both the input suppliers and the financial institutions benefit from these contract innovations. Institutions such as SPVs allow sharing of the risk between various agents, and hence, will stimulate investments by companies who otherwise may be deterred by the risk⁷.

Another example of a triangular structure with a specially designed institution is the collaboration between the Russian dairy processor Wimm Bill Dann (WBD) and the Swedish dairy equipment seller De Laval in to sell milking equipment to Russian dairy farms through leasing contracts. The program allowed financially constrained dairy farms to lease milking equipment. The farms paid off by delivering the raw milk to one of the dairy processors owned by WBD (World Bank, 2005)⁸.

*Warehouse receipt finance*⁹

Warehouse receipt payments is another form of indirect VCF in which safe and secure warehouses issue warehouse receipts to depositors of commodities and allow financial institutions to use the deposited inventory as safe, dependable and liquid collateral. This is an indirect form of VCF in which producers can use deposits at a warehouse as collateral for a loan¹⁰. Such a system is most common for grains and other non-perishable products¹¹.

⁷ In some cases such structures have developed with farmer participation. For example, Gow and Swinnen (2001) report that in Eastern Hungary a group of sheep farmers set up a producers' co-operative through which they participated in an SPV-like joint company.

⁸ One example of this was implemented by an international financial institution specialized in agribusiness and food supply chain financing, in Hungary, in collaboration with local agribusiness partners (Gow and Swinnen 2001). See also van Empel (2010).

⁹ See Höllinger et al (2009) for a review of warehouse receipt finance in transition countries.

¹⁰ Warehouse receipts systems have also been set up in e.g. the Kenyan maize market in 2007 but remain very limited there (Collins, 2009).

¹¹ Warehouse receipt systems have proven to be a successful instrument in providing finance in the value chains for source countries, in particular for storable commodities, such as grains. For example, a study by Rylko et al. (2000) estimated that the introduction of a WHR system in Russia could increase the liquidity in the system by approximately 2 billion US\$, which was approximately the same size as the largest federal credit program in Russia. Sometimes informal warehouse receipt systems have developed without waiting for the necessary government regulations. For example, in the Ukraine in 2002, banks were making contracts with elevators that hold grain and oilseeds as collateral for loans taken by farmers although at that time there was not yet a legal basis for this as a warehouse receipt system in place, which limited the ability of farmers and crushers to use stored seed as collateral (EBRD/FAO 2002). Similarly in Russia, a "quasi warehouse receipt system" developed and was widely used to collateralize inventories (e.g. of grains and oilseeds) in a number of transactions. The fact that such systems developed widely despite major legal problems indicates the huge gains in

Importance of VCF

White and Gorton (2004), Dries et al (2009) and Swinnen (2006) find that the introduction of VCF programs by agribusiness companies is a common phenomenon across transition countries.

Also in Latin-America, VCF through credit and input provision in contract-farming schemes is widespread over many different agricultural sectors such as fruits & vegetables sector, poultry, tobacco, sugarcane, barely and rice (Dirven, 1996). Similarly at least in some value chains in India, VCF is quite common. Gill (2003) finds that in two districts in the Indian Punjab, respectively 65% and 37% of farmers borrowed through value chains. The dominant mode of this lending was cash and inputs (fertilizer, seeds, pesticides, etc.) for repayment in the form of crops. Gulati, Minot, Delgado and Bora (2007) point out, with evidence from several South and Southeast Asian countries and from several sectors, that smallholder and poor farmers participate in and benefit from contract-farming schemes and VCF systems in food supply chains in Asia. In Sub-Saharan Africa (SSA), private VCF has become a dominant system of rural financing. For example, in Mozambique and Zambia it is virtually the only source of finance for agricultural households (IFAD, 2003). It is estimate for SSA as a whole that 50% of rural households that access credit do some from wholesalers, retailers and processors in the form of VCF (DFID, 2004). According to IFAD (2003) the VCF in SSA is mostly direct VCF in the form seasonal credit and input provision in contract-farming schemes; and is most common in traditional tropical export sectors (coffee, tea, cocoa, rubber and oil palm) and in high-value non-traditional export sectors (horticulture)¹². Similarly, Neven et al (2009) point out that supermarkets in Kenya provide VCF to an horticulture farmers. Similar findings were documented in other cases; for example in horticulture export chains in Ghana (Legge et al., 2006), Kenya (McCulloch and Ota, 2002), Cote d'Ivoire (Minot and Ngigi, 2004), and Senegal (Maertens and Swinnen, 2009). Also, the vegetable export sector in

efficiency from such institutions supporting exchange and the large potential for better regulated systems (Csaki et al, 2002). Warehouse receipts systems have also been set up in e.g. the Kenyan maize market in 2007 but remain quite limited there (Collins, 2009).

¹² For example, in Mozambique respectively 270,000 and 100,000 smallholders receive input credit from cotton and tobacco companies in contract-farming systems (IFAD, 2003). Also Zambia and Kenya, contract-farming and VCF are widespread in different sectors. It is estimated that food companies in South-Africa provided 91 million dollar of supply chain credit to 530,000 farm households in the period 2001-2003 (DFID, 2004).

Madagascar is based on contract-farming with small and poor farmers who receive inputs on credit from exporting companies (Minten et al., 2009).

In summary, many countries and sectors, VCF is becoming more important than pure credit transactions in traditional commercial and informal lending. Maertens (2007) has analyzed the importance of VCF for smallholder horticulture households in Senegal and finds that farmers who contract with exporting companies receive on average about 300.000 FCFA seasonal credit from the companies, mostly in the form of inputs, while on average in the area farm-households can access only about 130.000 FCFA of credit a year from other formal and informal sources.

Impact of VCF on Productivity, Quality and Output

Empirically, the impact of private VCF systems on productivity is difficult to quantify as several other factors affect output simultaneously and as company level information is difficult to obtain. Still, whatever evidence is available suggests that successful private VCF has important positive effects, both direct and indirect.

Case studies indicate that private VCF programs can lead to strong growth in output, quality and productivity. For example, case studies of the sugar and dairy sectors in East Europe show how VCF caused output, yields, and investments to grow dramatically (Gow et al, 2000; Swinnen, 2006). In the case of Polish dairy farms, VCF induced an increase in farm investments (in particular cooling tanks and better cows) in the mid 1990s. As a result the market share of the highest quality milk increased from less than 30% on average in 1996 to around 80% on average in 2001 (Dries and Swinnen, 2004).

VCF has indirect spillover effects as households' overall access to capital increases and their risk reduces. VCF also implies guaranteed sales, often at guaranteed prices, which reduces marketing risk for farmers. Coordinating firms also share in the production risk of farmers through ex ante provision of inputs and credit. Moreover, credit arrangements and prompt cash payments after harvest in VCF programs improves farmer's cash flow and access to capital, with spillover effects on other household activities, including other crops. Reduced risks, improved income stability and access to capital are particularly important effects in the case of capital and insurance market imperfections.

A number of empirical studies provide evidence for these household spillover effects. Henson (2004) shows that contracted vegetable farmers in Uganda benefit from reduced risk and improved access to credit. Another illustrative example comes from Minten et al. (2009) on the vegetable sector in Madagascar. A large number of very small farms benefit from vegetable contract farming through more stable incomes,

shorter lean periods, and technology and productivity spillovers on rice. Studies examining the motivations of farmers to engage in contract-production with VCF show that access to inputs and credit and guaranteed sales and prices, are the most important motivations rather than direct income effects (see table 2).

If the processing firm can set the terms of the VCF contract such that it captures the rents, the productivity growth may not benefit the farms (Stiglitz); and interlinking may even bestow additional monopoly power upon the processing company, which may exploit unequal power relationships with farmers to extract rents from the chain. While empirical evidence on this issue is limited, and very few studies have actually tried to measure this, what is available suggests that farmers do share importantly in the benefits of VCF. For example, studies on the FFV export sector in Africa (Madagascar by Minten et al (2009) and in Senegal by Maertens and Swinnen (2009) and Maertens et al (2010)) find that there are strong poverty reduction effects from vertical coordination and VCF in high-value supply chains.

Policy Issues

The policy issues related to VCF and development can be classified, roughly, in three groups – although some of the policies could fit in more than one of these groups: (1) the enabling environment for the emergence of VCF, (2) policy and programs for addressing rent distributional and efficiency concerns of VCF, and (3) implications of VCF for public interventions and role in agriculture and agri-business development.

First, it is important to emphasize a general policy implication, which is to recognize the potential importance of VCF and, therefore, the need to explicitly integrate this into policy thinking and program strategies. One of the key findings of this review is that VCF is more widespread than generally recognized, albeit with significant variation across countries and sectors. Hence there is no one-size-fits-all VCF but instead several models of VCF, reflecting commodity characteristics, stages of transition and development, and there is no one-size-fits-all policy. Instead optimal policies and policy components will also need to differ and change to reflect these differences.

Second, policy implications are the need for a good investment climate and the reduction of policy uncertainty, which is the primary concern of firms in developing countries. A poor policy environment has a negative effect on investments in supply chain and on the beneficial effects of VCF programs.

Third, macro-economic stability is a key condition not only for the investments but, even more so, for various forms of chain-based finance. Since VCF is importantly

a financial activity, significant instability may cause such changes in the contract conditions that self-enforcement is no longer possible. Hence, macro-economic stability is not only necessary for more traditional finance systems but also for VCF.

Fourth, an important issue is the role of competition, both for efficiency and equity. Competition induces processors, retailers, and input suppliers to provide VCF and it constrains rent extraction of suppliers by up- or downstream companies (Swinnen, Sadler and Vandeplass, 2006). Given these strong benefits of competition for farms in the chain, ensuring competition is an important role for the government. Competition can be enforced through both domestic policies (e.g., competition policies, lower barriers of entry) as well as external policies (e.g., liberal trade policies). The importance of competition does not only apply to private companies, but holds also for the case when the government is directly or indirectly imposing a monopoly system and thereby extracting rents from farms (eg Sadler, 2006). However, it should also be pointed out that some have argued that too much competition may be detrimental to VCF as it can undermine enforcement (Poulton et al).

Fifth, related to the competition issue, it remains important to encourage alternatives in credit markets. Empowering farmers in VCF relations with companies will come importantly from alternative options in accessing credit. The existence of alternative channels of credit or inputs will constrain rent extraction in the supply chains; and is good in general. Therefore, the existence of VCF does not necessarily diminish the importance of investments in alternative sources of farm finance.

Sixth, another area where governments can play an important role is investments in institutions to assist farms with credit contract negotiations and dispute settlements. As it is generally either not possible or too costly to resolve disputes in courts, alternative dispute settlement institutions can play an important role. Measures to increase the transparency of VCF contracts, to support alternative dispute settling arrangements, provide market benchmarks for price negotiations, training farmers in their rights/obligations as contractors etc. are all important to increase the transparency of the VCF system, competition among systems, and thereby the bargaining position of farms.

Finally, governments (and development agencies) should look into supporting innovative finance instruments ("Finance The Chain"). A key conclusion is that the most successful VCF approaches have addressed specific constraints, are flexible, and allow adjustments to reflect changes in the environment. Some innovative instruments using chain-based financing are mostly private initiatives and there is only a limited role for the government. In other cases there may be a more important role in

e.g. the regulatory and legal system which is required for these instruments to function; or there may be a role in co-financing seed money to start up some of these innovations. The key conclusion seems to be one of being open to innovations which explicitly take into account the supply chain as a structural aspect of the financing problem, while being critical on which role international organizations and the government should play.

References (to be integrated and finalized)

- Augier, P., Gasiorek, M. and C. Lai Tong, 2005. The Impact of Rules of Origin on Trade Flows, *Economic Policy* 20(43), 567-623.
- Barron, M.A. and Rello, F., 2000. The impact of the tomato agroindustry on the rural poor in Mexico. *Agricultural Economics* 23: 289-297.
- Dolan, C. and J. Humphrey (2000). Governance and Trade in Fresh Vegetables: The Impact of UK Supermarkets on the African Horticulture Industry." *Journal of Development Studies*, 37(2): 147-76.
- Dries, L. and J. Swinnen. 2004. Foreign Direct Investment, Vertical Integration, and Local Suppliers: Evidence from the Polish Dairy Sector. *World Development*, 32(9): 1525-44.
- Dries, L., T. Reardon, and J. F. Swinnen (2004). The Rapid Rise of Supermarkets in Central and Eastern Europe: Implications for the Agrifood Sector and Rural Development. *Development Policy Review*, 22(5): 525-56.
- Fafchamps, M. (2004). *Market Institutions in Sub-Saharan Africa: Theory and Evidence*. MIT Press.
- Glover, D. and K. Kusterer (1990). *Small Farmers, Big Business. Contract Farming and Rural Development*. London: The MacMillan Press LTD.
- Govere, J., Jayne, T.S., and Nyoro, J. 1999. Smallholder commercialization, interlinked markets and food crop productivity: Cross-country evidence in Eastern and Southern Africa. Working Paper, Michigan State University.
- Gow, H. and J. Swinnen, 2001, "Private Enforcement Capital and Contract Enforcement in Transition Countries" *American Journal of Agricultural Economics*, 83(3): 686-690.
- Gow, H., Streeter, D., and J. Swinnen, 2000. "How private contract enforcement mechanisms can succeed where public institutions fail: the case of Juhocukor a.s. *Agricultural Economics*, 23(3): 253-65.
- Greif, A. (2006). *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge University Press.
- Henson, J., A.-M. Brouder, and W. Mitullah (2000). Food Safety Requirements and Food Exports from Developing Countries: The Case of Fish Exports from Kenya to the European Union. *American Journal of Agricultural Economics*, 82(5):1159-69.
- Hoff, K. and J. E. Stiglitz. 1998. Moneylenders and bankers: price-increasing subsidies in a monopolistically competitive market." *Journal of Development Economics*, 55: 485-518.
- Horstmann, I.J. and J. R. Markusen (1996) Exploring new markets: direct investment, contractual relations and the multinational enterprise. *International Economic Review*, 37(1): 1-19.
- Inderst, R. and C. Wey (2007) Buyer power and supplier incentives. *European Economic Review* 51: 647-667.
- Jaffee, S. and S. Henson (2005). Agro-food Exports from Developing Countries: the Challenges Posed by Standards. In M. Aksoy and J. Beghin (eds.) *Global Agricultural Trade and Developing Countries*, The World Bank, Washington DC.

- Klein, Benjamin, Crawford, Robert G., and Alchian, Armen A. 1978. Vertical integration, appropriable rents, and the competitive contracting process. *Journal of Law and Economics*, 21(2): 297-326.
- Kranton, Rachel, and Anand V. Swamy. 2008. "Contracts, Hold-Up, and Exports: Textiles and Opium in Colonial India." *American Economic Review*, 98(3):967-89.
- Marcoul, P. and L. P. Veyssiere (2008). A Financial Contracting Approach to the Role of Supermarkets in Farmers' Credit Access. Mimeo.
- Mazzarotto, Nicola, 2004. Retail mergers and buyer power. Centre for Competition and Regulation Working Paper CCR 04-3.
- McCluskey, J. (2007). Public and private food quality standards: recent trends and strategic incentives." In J. F. Swinnen (ed.) *Global Supply Chains, Standards, and the Poor*," Oxon: CABI Publishing.
- MacLeod, W. B. (2006). Reputations, Relationships and the Enforcement of Incomplete Contracts. IZA Discussion Paper No. 1978.
- Maertens, M. and Swinnen, J. 2009. Trade, Standards, and Poverty: Evidence from Senegal. *World Development*, 37(1): 161-178.
- Minten, B., Randrianarison, L. and Swinnen, J.F.M. 2009. Global Retail Chains and Poor Farmers: Evidence from Madagascar. *World Development*, forthcoming.
- Mookherjee, D. and D. Ray (2002). Contractual Structure and Wealth Accumulation. *American Economic Review*, 92(4): 818-49.
- Nash, J. 1953. Two-person cooperative games." *Econometrica*, 21(1):128-140.
- North, D. C. (1990). *Institutions, Institutional Change, and Economic Performance*. New York: Cambridge University Press.
- Petersen, Mitchell and Raghuram G. Rajan, 1995, "The effect of Credit market competition on lending relationships," *Quarterly Journal of Economics*, 110(2): 407-43.
- Platteau, J.-P. (2000). *Institutions, Social Norms and Economic Development*. Routledge.
- Reardon, T., C. Timmer, C. B. Barrett, and J. Berdegue (2003). The rise of supermarkets in Africa, Asia and Latin America." *American Journal of Agricultural Economics*, 85(5):1140-6.
- Reardon, T. and J. A. Berdegue (2002). The Rapid Rise of Supermarkets in Latin America: Challenges and Opportunities for Development. *Development Policy Review*, 20(4): 317-34.
- Salop, S.C. 1979. A Model of the Natural Rate of Unemployment. *The American Economic Review*, 69(1): 117-125.
- Sutton, J. (1986) Non-cooperative bargaining theory: an introduction. *The Review of Economic Studies*: 53(5): 709-724.
- Sutton, J. (2001). Rich Trades, Scarce Capabilities: Industrial Development Revisited. Keynes Lecture, Proceedings of the British Academy.
- Svejnar, J. (1986) Bargaining power, fear of disagreement, and wage settlements: Theory and evidence from US industry. *Econometrica*, 54(5): 1055-1078.
- Swinnen, J., Rozelle, S., Xiang, T. and T. Vandemoortele. 2008. A theory of standards-driven rural development. LICOS Discussion paper 199/2008.

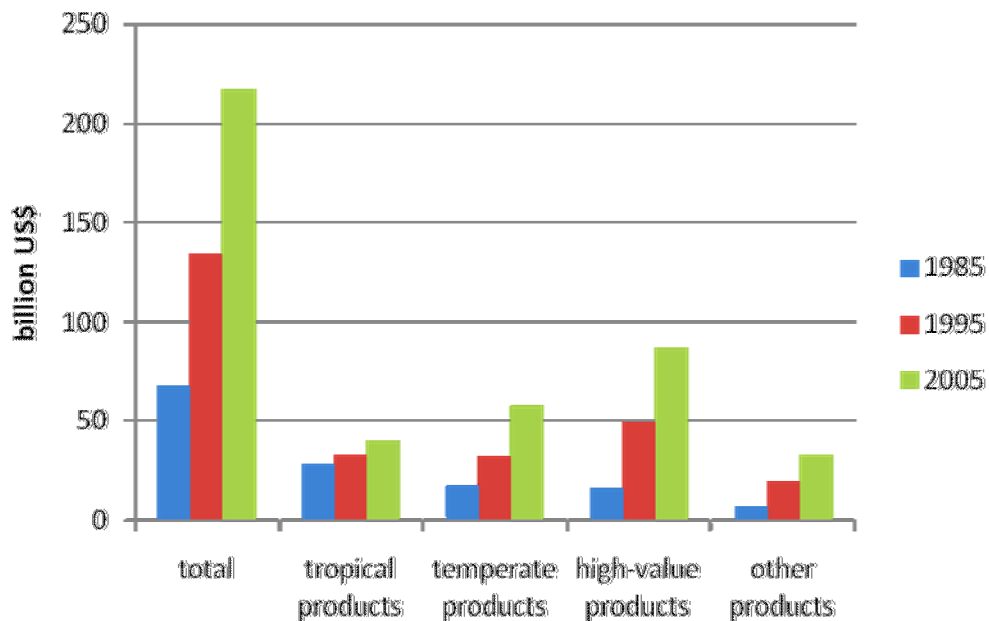
- Swinnen, J. F. (ed.) (2007). *Global Supply Chains, Standards and the Poor*. Oxfordshire: CABI Publishing.
- Swinnen, J. F. and T. Vandemoortele (2008). The Political Economy of Nutrition and Health Standards in Food Markets. *Review of Agricultural Economics*, 3(9): 460-8.
- Unnevehr, L. (2000). Food Safety Issues and Fresh Food Product Exports from LDCs. *Agricultural Economics*, 23(3):231-40.
- Wang, H., X. Dong, S. Rozelle, J. Huang, and T. Reardon (2006). Producing and Procuring Horticultural Crops with Chinese Characteristics: Case Studies in Greater Beijing and Shandong Province. Staff Paper 2006-05, Dept. of Agricultural Economics, Michigan State University.
- Warning, M. and N. Key. 2002. The Social Performance and Distributional Consequences of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal. *World Development*, 30(2): 255-263.
- Williamson, O.E. 1981. "The economics of organization: the transaction cost approach." *American Journal of Sociology*, 87(3): 548-577.
- World Bank, 2005. *The Dynamics of Vertical Coordination in Agrifood Chains in Eastern Europe and Central Asia. Implications for Policy Making and World Bank Operations*, World Bank, Washington DC.
- Adams D.W., Graham D.H. and J.D. Von Piske. 1984. *Undermining Rural Development with Cheap Credit*. Boulder: Westview Press.
- Bardhan, P., 1989, *The Economic Theory of Agrarian Institutions*. Clarendon Press, Oxford, UK.
- Bauman, P. 2000, "Equity and Efficiency in Contract Farming Schemes: the Experience of Agricultural Tree Crops" Working Paper 139. Overseas Development Institute. London.
- Bell, C. and T.N. Srinivasan, 1989. Interlinked Transactions in Rural Markets: An Empirical Study of Andhra Pradesh, Bihar and Punjab. *Oxford Bulletin of Economics and Statistics*, 15(1): 73-83.
- Collins, ILRI-AGRA workshop, 2009
- Dirven, M., 1996. "Agroindustria y pequeña agricultura. Síntesis comparativa de distintas experiencias (LC/R.1663)" Santiago de Chile, CEPAL.
- Dolan, C. and J. Humphrey, 2000, "Governance and Trade in Fresh Vegetables: the Impact of UK Supermarkets on the African Horticulture Industry" *Journal of Development Studies*, 37(2), pp. 147-76
- Dries, L. and J. Swinnen, 2004, "Foreign Direct Investment, Vertical Integration and Local Suppliers: Evidence from the Polish Dairy Sector" *World Development*, 32(9), pp. 1525-1544
- Gereffi, G., J. Humphrey and T. Sturgeon, 2005, "The Governance of Global Value Chains" *Review of International Political Economy*, 12(1), pp. 78-104.

- Gow, H., D.H. Streeter, and J. Swinnen, 2000, "How private contract enforcement mechanisms can succeed where public institutions fail: the case of Juhocukor a.s.", *Agricultural Economics*, (23) 3: 253-265.
- Gulati, A, Minot N., Delgado, C and S. Bora, 2005. "Growth in High-Value Agriculture in Asia and the Emergence of Vertical Links with Farmers". Paper presented at the workshop *Linking Small-scale Producers to Markets: Old and New Challenges*, The World Bank, Washington D.C.
- Henson S.J., 2004 "National Laws, Regulations, and Institutional Capabilities for Standards Development." Paper prepared for World Bank training seminar on Standards and Trade, January 27-28, 2004. Washington, D.C.
- Höllinger, F., Rutten, L. and K. Kiriakov, 2009, "The use of warehouse receipt finance in agriculture in transition countries", working paper, FAO Investment Centre
- IFAD, 2003, *Agricultural Marketing Companies as Sources of Smallholder Credit in Eastern and Southern Africa. Experiences, Insights and Potential Donor Role*, Rome, December 2003
- Kirsten, J. and K. Sartorius, 2002, "Linking Agribusiness and small-scale farmers in developing countries: is there a new role for contract farming?" *Development Southern Africa*, 19(4), pp.503-529.
- Kloeppinger-Todd, R. and M. Sharma (eds.), 2010, *Innovations in Rural and Agricultural Finance*, IFPRI and the World Bank.
- Johnson, D.G. and K.M. Brooks (eds.). 1983. *Prospects for Soviet Agriculture in the 1980s*. Bloomington: Indiana University Press.
- Maertens, M., Dries, L., Dedehouanou F.A, and J.F.M. Swinnen, 2006. "High-value Global Supply Chains, EU Food Safety Policy and Smallholders in Developing Countries. A Case-study from the Green Bean Sector in Senegal" In: Swinnen, J.F.M (ed) *Global Supply Chains, Standards and the Poor*, CABI publishing.
- Maertens, M. and J.F.M. Swinnen, 2009 "Trade, Standards and Poverty: Evidence from Senegal" *World Development*
- Miller, C. and C. Da Silva, 2007, "Value Chain Financing in Agriculture", *Enterprise Development and Microfinance*, 13(2/3), Practical Action Publishing
- Miller, C. and L. Jones, 2010, *Agricultural Value Chain Finance. Tools and Lessons*, FAO and Practical Action Publishing
- Minten, B., Randrianarison, L., Swinnen, J., 2009, "Global Retail Chains and Poor Farmers: Evidence from Madagascar", *World Development*
- Poulton C., A. Dorward, J. Kydd, N.Poole and L. Smith.,1998. A New Institutional Economics Perspective on Current Policy Debates. In Dorward, A., J. Kydd. and C. Poulton (eds) *Smallholder Cash Crop Production under Market*

- Liberalisation: A New Institutional Economics Perspective*. CAB International, Oxon, pp. 56–112.
- Quiros, R (ed.), 2007, *Agricultural Value Chain Finance*, FAO and Academia de Centroamerica, San José
- Reardon, T. and J. Swinnen, 2004, “Agrifood Sector Liberalization and the Rise of Supermarkets in Former State-Controlled Economies: Comparison with Other Developing Countries”, *Development Policy Review* 22(4): 317-334
- Rozelle, S. and J. Swinnen, 2004, “Success and Failure of Reforms: Insights from Transition Agriculture”, *Journal of Economic Literature* 42(2): 404-56.
- Stiglitz, J.E. and A.M. Weiss, 1981. Credit Rationing in Markets with Imperfect Information. *American Economic Review* 71(3): 393-410
- Swinnen, J. (ed.), 2006, *The Dynamics of Vertical Coordination in Agrifood Chains in Eastern Europe and Central Asia: Case Studies*, The World Bank, Washington D.C.
- Swinnen, J. (ed.), 2007, *Global Supply Chains, Standards and the Poor*, CAB International Publishing.
- Swinnen, J. and M. Maertens, 2007. Globalization, Privatization and Vertical Coordination in Food Value Chain in Developing and Transition Countries. *Agricultural Economics*, 37(2), pp 89-102.
- Swinnen, J. and S. Rozelle, 2006, *From Marx and Mao to the Market. The Economics and Politics of Agricultural Transition*, Oxford University Press.
- Van Empel, G., 2010, “Rural banking in Africa: the Rabobank approach”, Brief 4 in *Innovations in Rural and Agricultural Finance*, edited by R. Kloeppinger-Todd and M. Sharma, IFPRI and the World Bank.
- Warning M. and N. Key, 2002. The Social Performance and Distributional Impact of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal. *World Development*, 30(2): 255-263.
- White, J. and M. Gorton, 2004, *Vertical Coordination in TC Agrifood Chains as an Engine of Private Sector Development: Implications for Policy and Bank Operations*, Worldbank, Washington DC.
- Winn, M., Miller, C. and I. Gegenbauer, 2009, The use of structured finance instruments in agriculture in Eastern Europe and Central Asia“, FAO Agricultural Management, Marketing and Finance working document.
- WOCCU, 2009. Integrated Financing for Value Chains. World Council of Credit Unions. Report.

- World Bank, 2005, *The Dynamics of Vertical Coordination in Agrifood Chains in Eastern Europe and Central Asia. Implications for Policy Making and World Bank Operations*, The World Bank, Washington D.C.
- Zeller M. 2000. Product Innovation for the Poor: The Role of Microfinance. Rural Financial Policies for Food Security of the Poor, Policy Brief No. 3, International Food Policy Research Institute, Washington D.C.
- Zeller, M. 2003. Models of Rural Financial Institutions. Paving the Way for Rural Finance: an International Conference on Best Practices. Washington D.C, June 2-4, 2003.
- Zeller, M. 2006. A comparative review of major types of rural microfinance institutions in developing countries. *Agricultural Finance Review*, Vol 66, pp. 195-213.
- Zeller M. and M. Sharma, 2000. Many borrow, more save and all insure: implications for food and microfinance policies. *Food Policy*, Vol. 25, pp. 143-167.

Figure 1. Changing structure of developing countries¹ agro-food exports, 1985 – 2005



Tropical products include coffee, cocoa, tea, nuts and spices, textile fibres, sugar and confectionary; temperate products include cereals, animal feed and edible oils; high-value products include fruits, vegetables, fish, seafood, meat and meat products, milk and dairy products; other products include tobacco and cigarettes, beverages, rubber, and other processed food products.

¹ Developing countries include all low- and middle-income countries in Africa, Central-America, South-America and the Caribbean; East Asia, South Asia, Southeast Asia and Central Asia.

Source: Maertens et al. (2009)

Table 1: Smallholder procurement in Sub-Saharan African export supply chains

Country	Commodity (group)	Year of survey	Share of exports sourced from smallholders	Number of smallholder producers
Ghana	Fruits & vegetables			3,600
	Pineapples	2006	45%	300 - 400
	Papaya	2006	10-15%	
	Vegetables	2002	95%	
Cote d'Ivoire	Pineapple	1997	70%	
	Mango	2002	< 30%	
	Banana	2002	100%	
Senegal	French beans	2005	52%	600 - 900
	Tomatoes	2006	0%	0
Kenya	Fresh fruit and vegetables	2002	± 50%	12,000 - 80,000
Madagascar	Fresh vegetables	2004	90-100%	9,000
Zambia	Vegetables	2003		300
Zimbabwe	Fruits & vegetables	1998	6%	10

Source: Maertens et al. (2009)

Table 2 : Motivations of small farmers to supply high-value chains*a. Cotton farms in Kazakhstan*

	Reason for contracting (%)	Most important reason (%)
Guaranteed product sales	9	8
Guaranteed price	4	3
Access to credit	81	75
Access to quality inputs	11	10
Access to technical assistance	0	0
Other	4	3

b. Vegetable farms in Sub-Saharan Africa

	Madagascar 2004	Senegal 2005	
	Reason for contracting (%)	Reason for contracting (%)	Most important reason (%)
Stable income	66	30	
Stable prices	19	45	15
Higher income	17	15	
Higher prices		11	10
Guaranteed sales		66	32
Access to inputs & credit	60	63	44
Access to new technologies	55	17	0
Income during the lean period	72	37	

Source: Minten et al., 2006; Maertens et al., 2006; Swinnen, 2005