CHAPTER 3

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

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1 Introduction

The growth of value chains and the associated spread of quality standards has triggered a vigorous debate in the development community over their impacts on poor producers in developing countries.[3] Quality requirements in value chains affect farms through several channels. First, ever-more rigorous public quality requirements in richer countries are 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 marketing channels, which are often vertically coordinated, is associated with increasing quality standards (Swinnen, 2007). For example, modern retailing companies increasingly dominate markets in fruits and vegetables, including urban markets in many poorer countries, and have begun to set standards for food quality and safety in this sector wherever they do business (Dolan and Humphrey, 2000; Henson et al., 2000). Third, rising investment in processing in developing countries also has induced demand for higher-value and higher-quality 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).

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

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The development implications and the impact on 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 propoor growth. On the other hand, tightening food safety and quality standards, both from private and public sources, strongly affects domestic and international trade, and value chains (Jaffee and Henson, 2004). Some have argued that they reinforce global inequality and poverty as: (1) they introduce new (non-tariff) barriers to trade; (2) they exclude small, poorly informed, and weakly capitalized producers from participating in these high-quality supply systems; and (3) because large and often multinational companies extract 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 value chains because it is easier for companies to contract with a few large farms rather than with numerous 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 often voiced and raised in studies on the impact of the growth of high value chains, which regularly emphasizes the shift to larger, preferred suppliers and the exclusion of small farms (e.g. Reardon and Berdegué, 2002).

However, there is considerable debate and uncertainty about the validity of these arguments, and more generally about 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. 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, as we shall see later in this chapter. 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 fruit and vegetable 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 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 that may participate either as smallholder producers or through wage employment on larger farming companies (Maertens and Swinnen, 2009; Maertens et al., 2011; 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.

To understand these welfare effects it is important to realize that the introduction of higher quality requirements has coincided with the growth of value chain finance (VCF) and technology transfer (Dries et al. 2009; Miller and Jones 2010, Quiros 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., 2009; 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 that cannot source from international capital markets. However, the enforcement of contracts for quality production and value chain finance is difficult in developing countries that are often characterized by poorly functioning enforcement institutions. These enforcement problems can add significantly to the cost of contracting and may prevent actual contracting from taking place and inhibit value chain financing.

The first part of this chapter 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.

2 Increased Importance of Value Chains

The growth of value chains in emerging and developing countries is related to two factors: the growth of demand for high-value products in local markets, and 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 by 200 percent in 1980–2005, while consumption of cereals stagnated during that period. 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 (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 percent of GDP in the early 1990s in most developing and emerging countries to 25 percent in 2005 in Southeast Asia and the transition countries, and 30 percent in Africa and Latin America. 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, fish and seafood products – from developing countries increased more than 300 percent in the period 1980–2005 and now constitute more than 40 percent 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 toward non-traditional and high-value exports started earlier, but for Africa, Latin America, and the Caribbean the decreasing importance of traditional crops and the growth in fruits and vegetable exports mainly took place over the past two decades.

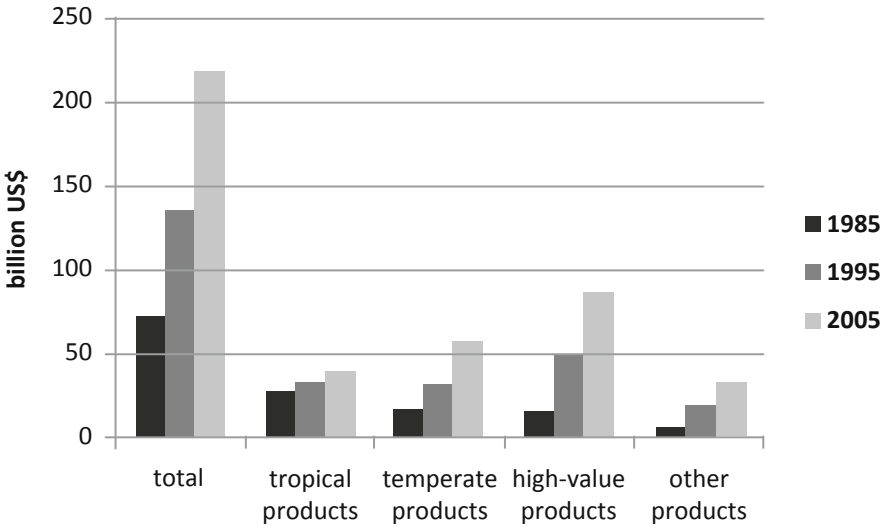

Fig. 1. Changing structure of developing countries' agro-food exports, 1985–2005[4]
Source: Maertens et al. (2009)

[4] *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.

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.

These non-traditional exports mainly concern products such as fruits, vegetables, flowers, fish, and seafood, which 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 U.S. dollars in 1990 to 5.6 billion U.S. dollars 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 United States.

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, for example to volatilities and shocks in world market prices. The shift toward 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 generation and poverty reduction among smallholder producers in these countries.

3 Organization and Structure of Value Chains

The shift toward 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 distribution of the benefits.

3.1 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, vegetables, and seafood, which are easily perishable. Fresh food exports to the European Union, for example, have to satisfy 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, or-

ganic 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.

Public and private food standards have often been claimed 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 five-fold, while the number of new sanitary and phytosanitary measures (filed to the World Trade Organization (WTO) increased six-fold over the same period.

3.2 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. Large food companies are also spreading globally, through foreign direct investments. In this way they contribute to concentration outside of their home markets.

In many Eastern 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 percent, 61 percent, and 57 percent of supermarket sales in 2009. In most of South America, East Asia (outside China), and southern Africa, the average share of supermarkets in food retail went from only 10 to 20 percent in 1990 all the way to 50 to 60 percent by the early 2000s (Reardon et al., 2003). Also, food processing and exporting has become increasingly consolidated. For example, in Senegal the number of firms exporting green beans fell from 27 in 2002 to 14 in 2008 (Maertens et al., 2011).

3.3 Vertical Coordination and Value Chain Finance

The move toward 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.[5] First, at the production level, contracting and verti-

[5] 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

cal coordination has grown strongly in some of the high-value supply chains in Latin America, Asia, Europe, and Africa (Swinnen, 2007; World Bank, 2005). Part of these vertical coordination initiatives include the provision of, for example, finance, transportation, physical inputs, and quality control. However, investment loans and bank loan guarantees are also provided in several cases.

Rising food standards are increasingly associated with a shift toward 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.

Second, downstream vertical coordination is also 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.

4 Small Farmer Participation in Value Chains

The claims mentioned earlier in this chapter about the exclusion of small farms from value chains were based on limited empirical evidence. New empirical evidence from a variety of countries shows 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

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.

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	Pineapples	1997	70%	
	Mango	2002	<30%	
	Banana	2002	100%	
Senegal	French beans	2005	52%	600–900
	Tomatoes	2006	0%	0
Kenya	Fresh fruit & 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)

also show a very mixed picture of actual participation in value chains, with many more small farms being contracted than claimed initially. Table 1 summarizes this for a selection of countries.

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 and value chain finance going to different farm structures. 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 (Maertens and Swinnen, 2009). However, even this is not an undisputed general conclusion. Other studies show that the poorest may be included, and some countries (e.g. China) 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).

4.1 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 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 advise. 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. 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. 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 toward modern retailing (there has been a rapid increase in the share of food purchased by urban consumers in supermarkets, convenience stores, and restaurants), marketing and production are still organized by traditional methods.

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. We will document and explain these changes and the models that have emerged in the final section of this chapter.

5 Value Chain Finance[6]

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 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.

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 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

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[6] 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.

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.

Table 2. Motivations of small farmers to supply high-value chains

a. Cotton farms in Kazachstan

	Reasons 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., 2009; Maertens et al., 2007; Swinnen, 2005

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) (World Bank, 2005).

6 Models of Private Sector VCF

Different models of private-sector VCF exist. Sometimes different models of VCF develop because processors themselves do not have access to finance. For example, in the Ukrainian 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 percent of the crushers throughput of sunflower seeds was based on a tolling basis. Under the tolling system, crushers received 13 to 20 percent 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, traders), who sold the oil either in the domestic market (competing with the crushers) or exported it (EBRD/FAO, 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, 2005).[7] Hence the gins received themselves VCF from the international traders that they then used to finance their own VCF schemes with cotton farms. However, more generally, one can distinguish several "classes" of VCF.

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

6.1 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.

6.2 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 delivery of the product. These basic forms of VCF have been studied in the development literature on interlinked market transactions[8] and have been described as transactions in which credit and output markets are interlinked (e.g. Bardhan, 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, such as in Eastern Europe and the former Soviet Union, provide medium-term investment loans, investment assistance programs, and machinery procurement systems to farmers (Dries et al., 2009).

[8] 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).

6.3 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 fruit and vegetable supplier investments in greenhouses and irrigation (Reardon et al., 2003), and by dairy processors in several countries (Dries and Swinnen, 2004).

6.4 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, for example, by the processor, input providers, and a bank. The contract between the SPV and the farms can include provisions on output, inputs, and credit.

An important advantage of such institutions 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 the sharing of risk between various agents, and hence will stimulate investments by companies who otherwise may be deterred by the risk.[9]

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 DeLaval 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).[10]

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[9] 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 a SPV-like joint company.

[10] 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).

6.5 Warehouse Receipt Finance [11]

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 loan.[12] Such a system is most common for grains and other non-perishable products.[13]

7 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 and vegetables sector, poultry, tobacco, sugarcane, barley, and rice (Dirven, 1996). Similarly, at least in some value chains in India, VCF is quite common. Gulati et al. (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 estimated that for SSA as a whole, 50 percent of rural households that access credit do so from wholesalers, retailers, and processors in the form of VCF. (DFID, 2004). According to IFAD (2003), the VCF in Sub-Sahara Africa is mostly direct VCF in the form of seasonal credit and input provision in contract-farming schemes; and is most common in traditional, tropical export sectors (coffee, tea, cocoa, rubber, oil palm) and in high-value, non-traditional export sectors (horticulture)[14].

In summary, in many countries and sectors VCF is becoming more important than pure credit transactions in traditional commercial and informal lending.

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

[12] Warehouse receipts systems have also been set up, for example in the Kenyan maize market in 2007 but remain very limited there (Collins, 2009).

[13] 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, in transition countries (World Bank, 2005).

[14] For example, in Mozambique 270,000 and 100,000 smallholders respectively receive input credit from cotton and tobacco companies in contract-farming systems (IFAD, 2003).

Maertens et al. (2007) have analyzed the importance of VCF for smallholder horticulture households in Senegal and find 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 farm-households can access only about 130,000 FCFA of credit a year from other formal and informal sources.

8 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 Eastern 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 percent on average in 1996 to around 80 percent on average in 2001 (Dries and Swinnen, 2004).

VCF has indirect spill-over 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 periods without revenue, 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, credit, and guaranteed sales prices, are the most important motivations, not 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 (Bardhan, 1989); 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 horticultural export sector in Africa (Madagascar by Minten et al. (2009), and in Senegal by Maertens and Swinnen (2009), and Maertens et al. (2011)) find that there are strong poverty reduction effects from vertical coordination and VCF in high-value supply chains.

9 Policy Issues

There are a variety of policy issues related to VCF and development. They can be classified in several groups: the enabling environment for the emergence of VCF; addressing rent distributional and efficiency concerns of VCF; and implications of VCF for public interventions 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, and stages of transition and development. 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 necessary 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 the 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 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 and Vandeplas, 2010). 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 (competition policies, lower barriers of entry) as well as external policies (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. 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., 1998).

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, like bank credit to farmers, or leasing

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. 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, for example 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 is being open to innovations that explicitly take into account the value chain as a structural aspect of the financing problem.

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