



THE WORLD BANK

Environmentally and Socially Sustainable
Development Unit
Europe and Central Asia Region



The **Dynamics** of Vertical Coordination
in Agrifood Chains in Eastern Europe
and Central Asia
Implications for Policy and World Bank Operations

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Acknowledgments

The main author of the report was Johan F. M. Swinnen. Background studies were prepared by Siemen van Berkum, John White, Matthew Gorton, Marc Sadler, Liesbeth Dries, E. Gataulina, V. Uzun, A. Petrikov, and Renate Yanbykh. The report made use of insights from other studies prepared by Tom Reardon, Hamish Gow, Daniele Giovanucci, Kees van der Meer, Steven Jaffee, Emmanuel Hidier, and Willi Meyers. William Sutton, Maria Amelina, and Maurizio Guadagni advised on the preparation of the study. Mark Ludwick, Karin Roszkopf, and Gail Lee provided editorial assistance.

Steven Jaffee, Richard Henry, Csaba Csaki, and Ali Mansoor reviewed the study proposal and the final report and provided very useful comments and suggestions. Rapeepun Jaisaard, Juergen Venema, Maria Amelina, Maurizio Guadagni, Iain Shuker, Kees van der Meer, Gotz Schreiber, Kym Anderson, and participants at seminars where the study findings were presented contributed with helpful comments at various stages of the project.

Finally, Benoit Blarel and Laura Tuck provided much appreciated encouragement and critical guidance throughout the duration of the study.

Acronyms and Abbreviations

ADB	Asian Development Bank
AFIRUM	Agri-food Industry Restructuring in Ukraine and Moldova
AIB	Agroinvestbank
BLG	Bank Loan Guarantees
CEE	Central and Eastern European Countries
CEO	Chief Executive Officer
CIS	Commonwealth of Independent States
CPR	Cedula de Produto Rural
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
EU	European Union
FAO	Food and Agriculture Organization
FCDF	Friesland Coberco Dairy Foods
FDI	Foreign Direct Investment
FFV	Fresh Fruits and Vegetables
FIG	Financial-Industrial Groups
F&V	Fruits and Vegetables
IFAD	International Fund for Agricultural Development
ISPA	Instrument for Structural Policies for Pre-Accession
NGO	Non-governmental Organizations
NRIF	Non-registered individual farms
OECD	Organisation for Economic Cooperation and Development
PFID	Partnership for Food Industry Development
PMO	Producer Marketing Organization
RF	Reverse Factoring
RIF	Registered individual farms

SAPARD	Special Accession Programme for Agriculture and Rural Development
SPS	Sanitary and Phytosanitary
SPV	Special Purpose Vehicle
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USDA/ERS	United States Department of Agriculture/ Economic Research Service
VC	Vertical Coordination
WB	World Bank
WBD	Wimm Bill Dann
WRS	Warehouse Receipt Systems

Executive Summary

Vertical coordination (VC) in agrifood supply chains is an important and growing phenomenon in the transition countries of Europe and Central Asia (ECA). VC is more important and more widespread than generally recognized. These changes have significant implications for the role of public policy and for the World Bank. There is a need to explicitly integrate these VC developments into policy thinking and program strategies.

VC is more widespread in both scope and complexity in ECA than in Western economies. In the United States and Germany, around one-third of agricultural production is produced under contracts. However, VC in ECA differs significantly from rich and poor market economies. First, there is significant VC in sectors where we do not observe VC in other countries. Second, in sectors where VC exists in other countries, the forms of VC in transition countries are more extensive and complex. In the *dairy and sugar* sectors, extensive contracting arrangements have developed between processors and farms, including the provision of credit, investment loans, feed, inputs, extension services, bank loan guarantees, etc. In the *cotton* sector, gins typically contract farms to supply seed cotton and provide them with credit, seeds, fertilizer, etc. In *fresh fruits and vegetables* modern retail chains, quality and timeliness of delivery are required, along with developing supplier contracting with farm-assistance programs. In *grains sector*, there is strong vertical integration in Russia and Kazakhstan, where huge agroholdings produce a large share of the grain crop in some regions.

Private contractual initiatives have emerged to overcome disruptions of supply and poor public institutions for governing exchange. The privatization and restructuring of the agrifood chain caused major disruptions. Widespread contracting problems were long payment delays or

nonpayments for delivered products, causing drains on cash flow and constraints in accessing inputs and selling products. At the same time, food processing companies have problems obtaining quality supplies. The problems are worsened by the lack of public institutions necessary to support market-based transactions, such as for enforcing property rights and contracts.

Traders, agribusinesses, and food companies contract with farms and provide inputs and assistance in return for guaranteed and quality supplies. Successful vertical contracting typically includes conditions for product delivery, prompt payments, and farm-assistance programs for suppliers. Farm assistance can include input supply programs, investment assistance, trade credit, bank loan guarantees, extension and management advisory services, etc.

The search for quality is a key engine of VC. The shortage of quality supply, which is typical of transition countries, induces VC and spillover effects through farm support packages. The issue of quality has both efficiency and equity implications. Farms get a higher price for quality, but quality controls are not always transparent. Quality controls by independent institutions have both efficiency and equity benefits.

Contracting requires access to finance. Initiators of contracting with supplier assistance include foreign investors who can access international financial markets, companies who are investing profits from other sectors in the agrifood sector (e.g., financial-industrial groups [FIGs] in Russia), processors or traders who have liquidity by selling on international markets (e.g., grain traders in Kazakhstan), and processors who have contracts with international companies (e.g., cotton gins in Central Asia).

Enforcement is an important problem. Enforcement is problematic where public enforcement institutions are absent. Trust is also often lacking as a base for business exchanges in many transition countries. Companies try to create *self-enforcing contracts* by designing the terms of the contracts such that nobody has an incentive to breach the contract. They also try to enforce contracts by *interlinking markets*. The enforcement of the credit transaction (loan and repayment) occurs through the output market. However, there are many cases where enforcement failed. Even in successful cases it took considerable fine-tuning of the contracts or adjustments as circumstances changed. Creating the right conditions for successful and self-enforcing contracting requires extensive knowledge of the sector and of local conditions.

Vertical coordination differs by the stage of transition. In early stages, VC focuses on *securing supplies* by overcoming basic supply problems such as input (feed, seeds, etc.) and credit (working capital) constraints. An

important component of the early contracts is prompt payments. This is the case in some cotton supply chains in Central Asia and in emerging dairy and fruits and vegetables supply chains in countries such as Romania and the Caucasus. In more advanced situations, there is more emphasis on *product quality*. For this more sophisticated forms of VC are used, such as extension services and farm-level investments in technology and equipment, leasing, bank loan guarantees, investment assistance, etc. These programs require more complex implementation and enforcement systems.

Contract forms reflect different constraints faced by farms. For example, the dominant contract motivation for farms in Central Europe is guaranteed access to markets. The motivation for Central Asian cotton farmers is access to finance as credit constraints are most important.

Successful vertical contracting has important positive effects, both direct and indirect. The direct impact is on *increased output and productivity* of the processing company that initiates vertical contracting. Indirectly, contract support measures have positive effects on *farm productivity and product quality*. Measures with the greatest impact on yields were specialist storage (cooling equipment in dairy), veterinary support, and physical inputs. Prompt payments, guaranteed prices, and market access also had large positive effects. *Quality* of output improved strongly in response to specific programs. Direct loans and loan guarantee programs stimulated farm *investments*. Programs that assist farms in accessing inputs (mainly feed) enhance investment indirectly by lowering input costs, or reducing transaction costs in accessing inputs, improving profitability.

Horizontal spillovers occur as firms compete for suppliers and have to offer similar contractual arrangements. This has resulted in *contractual convergence*. Contractual spillovers are not limited to the same sector. Firms in adjacent commodity sectors, competing for the same farm resources, are sometimes forced to offer similar contractual arrangements that have led to similar results.

Not all examples of VC are successful. In particular, where governments are heavily and actively involved in the management of the vertical integration, the effects are dubious at best. In *cotton supply chains* in Central Asia where the government has allowed private gins to develop and to compete, such as in Kyrgyzstan and Kazakhstan, farms have benefited from VC, with relatively high prices and strong cotton growth. In Tajikistan and Uzbekistan, where governments actively control input supplies, production, processing, and marketing of cotton, VC resulted in major rent extraction of cotton farms, with depressed prices and stagnating cotton production.

In Russia, the government-led re-creation of huge agroholdings has contributed not only to more inputs for farms and strong growth in output and

yields, but also to poor financial results and substantial debts. Profits are worse than on nonintegrated farms. A key problem is the authorities' interference with production plans and with decisions relating to which activities (and companies) should be maintained by a holding, sometimes imposing unprofitable activities and companies on the holding.

Competition spreads equity and efficiency benefits. Competition is very important in supply chains for equity and efficiency. First, competition induces VC spillover effects across the sector as other processors are forced to introduce similar supplier-assistance programs since suppliers may not want to deliver unless they get similar conditions. Second, competition prevents processing companies or input suppliers from exercising monopoly power in setting contract conditions with farms. Competition among cotton gins in Kazakhstan allowed small suppliers to get better conditions by changing gins, induced investment by gins in local cotton seed collection centers reducing farm transport costs, and lead to better prices.

Foreign direct investment (FDI) drives successful contracting and supplier-assistance programs. It is an initiator of change and institutional innovation. More sophisticated forms of vertical integration, with a greater emphasis on quality and standards, are often introduced by foreign companies because they tend to pay greater attention to quality standards. But we also find that spillover effects lead to convergence as domestic companies start copying the management practices of foreign affiliates.

A concern is that vertical coordination will exclude many farmers, in particular small farmers. First, transaction costs favor larger farms in supply chains. Second, small farms are more constrained for making necessary investments. Third, small farms typically require more assistance per unit of output. Therefore, companies *prefer* working with relatively fewer, larger, and more modern suppliers.

In reality, companies work with surprisingly large numbers of suppliers and of surprisingly small size. There are several reasons. Companies may have no choice if small farmers represent most of the supply base. Contract enforcement may be more problematic with larger farms. Farms' willingness to learn and attitude are more important than size in farm-processor relationships. Small farms may have cost advantages in labor-intensive production activities. Processors may prefer a mix of suppliers. Cooperatives are more likely to work with small farms than corporate companies, either domestic or foreign.

The farm assistance paradox. Small poor farms may be best off (in the perspective of "supply-chain-driven development") if they are in an environment that is dominated by small poor farms. If small farmers must depend on farm assistance packages to make necessary upgrades, then it

will be a problem if sufficient (quality) supplies are available because the processor is unlikely to come up with VC packages.

ECA is a “supplier market,” for now. The collapse of farm output and livestock numbers created a gap between processing capacity and supply: hence there is excess demand based on processing capacity, especially for high quality. This makes it a “suppliers market” in most of ECA and this supports the farms’ bargaining position in the supply chain. However, an increase in competition among suppliers may lead to a consolidation of the supplier base. Supplier-assistance programs sometimes discriminate between farms with the focus of upgrading the better farms and ensuring a minimal supply base and quality from the rest as long as it is required. Hence, those who are concerned about the inclusion of small farms should not be complacent despite the observations of significant contracting with small suppliers right now.

Private vs. public: image and reality. The public policy debate (explicitly or implicitly) frames the issue of vertical integration and small farms in terms of how public policy can prevent (small) farms from being exploited by large, sometimes multinational, agribusinesses in their contractual relationships. However, reality suggests a much more nuanced picture. First, while profits are their primary concern for all agribusinesses, this does not seem to lead to exploitation of farms. In cases where sufficient competition exists there is more evidence that producers benefit from VC than that they are exploited. Second, farm exploitation resulted from governments either controlling input supplies and marketing or where authorities colluded with a private company, allowing and predating on the rent extraction by the private company in the cotton sectors of Tajikistan and Uzbekistan. Third, an important constraint on enterprise development in some countries is rent extraction by local governments, e.g., through taxation and ad hoc regulations. Only large corporations can withstand pressures from local authorities. This leads to a paradoxical situation that farms need to be large to withstand public pressures. Fourth, private supplier assistance schemes reach small farms that are left out of government programs. For them, the only source of credit and finance is supplier credit.

Implications for government policy and World Bank operations. The most important policy implication of this study is the recognition of the importance of the VC phenomena in ECA agrifood chains and the need to explicitly integrate these developments into policy thinking and program strategies. A government strategy to stimulate domestic growth in a supply-chain-driven development process while ensuring the inclusion of farms which face major constraints in this process, and an equitable distribution of rents in the chain, should include several policy components.

Enabling and Stimulating Vertical Coordination

- *Create the right conditions for stimulating investment.* A poor policy environment has a negative effect on investments in the agrifood industry and on VC programs. As such it constrains the beneficial effects of VC.
- *Ensure macroeconomic stability,* a key condition for investments and for supplier-assistance programs or chain-based finance. Since VC is importantly a financial activity, instability may undermine contract enforcement.
- *Refrain from direct intervention: bad policies are worse than bad weather.* Direct government intervention in the supply chains may crowd out alternative financing systems or cause defaults. Companies are willing to incorporate temporary VC defaults due to unforeseen shocks such as the weather but not systemic risks due to government interventions.

Improving Efficiency, Transparency, and Equity in Vertical Coordination

- *Reduce transaction costs.* The disadvantage of small suppliers is mostly due to transaction costs. Reducing transaction costs can be done in several ways:
 - *Lower transport costs through improvements of rural infrastructure.* Rural infrastructure is a serious constraint on VC, and particularly for integrating small producers in remote areas.
 - *Reduce the number of transactions by investing in intermediary institutions.* Intermediary institutions reduce the cost of exchange between farm and processor/input supplier. Invest in farm associations and collection points.
 - *Investment in farmers associations* has several advantages, such as reducing transaction costs, enhancing suppliers bargaining position vis-à-vis suppliers and governments, and improving information distribution.
- *Enforce competition.* Competition in the supply chain is important for efficiency and equity. Competition induces more supplier-assistance programs and constrains rent extraction. Competition should be enforced through both domestic policies (e.g., competition policies, lower barriers of entry) as well as external policies (e.g., liberal trade policies).
- *Stimulate and certify quality and safety standards and invest in projects, institutions, and technical assistance stimulating higher quality.* Modern supply chains are based on quality. Preparing suppliers for quality-driven markets will make it easier for them to be integrated in the chains.

- *Empowering farmers* is needed to strengthen their position in the chain and vis-à-vis governments in bargaining for better contract deals, better policies, etc. Policies include stimulating farmers associations, investing in quality control institutions, competition and trade policy, etc. Additional programs are to: invest in institutions to assist farms with contract negotiations and dispute settlements, invest in institutions for (independent) quality and safety control and certification, and encourage alternatives in input and output markets.

Rethinking the Role of the Government and Policy-Making

- *Policy analysis and information gathering.* Policy analysis is complicated by the emergence of VC. Traditional instruments of information collection do not include information on VC.
- *Rethinking traditional public investments.* Traditional areas of public investment such as research and extension, market information systems, veterinary services, and animal surveillance programs need to take into account the role that VC plays in these areas.
- *Public-private partnerships: consider supply chains part of the solution, not the problem.* Focus on collaborations between public authorities, non-governmental organizations, and private companies.
- *Innovative finance instruments.* Chain-based financing instruments can be very successful. Focus on innovations that use the supply chain as a structural aspect of the financing problem, while being critical on which role international organizations and the government should play.
- *Supply-chain development as part of a wider rural development strategy.* Countries with many small farmers are typically characterized by overemployment in agriculture. Integration of the farms in modern supply chains cannot solve all structural problems. Supply-chain development models, even inclusive ones, can be only one part of a broader development strategy.

The Dynamics of Vertical Coordination in Agrifood Chains in Eastern Europe and Central Asia

*Implications for Policy and
World Bank Operations*

INTRODUCTION AND BACKGROUND

A major problem in the transition countries of Europe and Central Asia (ECA) during the transition was the breakdown of the relationships of farms with input suppliers and output markets. The simultaneous privatization and restructuring of the farms and of the up- and downstream companies in the agrifood chain has caused major disruptions. The result is that many farms and rural households face serious constraints in accessing essential inputs (feed, fertilizer, seeds, capital, etc.) and in selling their products. The problems are worsened by the lack of public institutions necessary to support market-based transactions, such as for enforcing property rights and contractual agreements.

In the absence of appropriate public institutions, private contractual initiatives, often from large food and agribusiness companies, are emerging to overcome these obstacles. Large traders, agribusinesses, and food processing companies, often as part of their own restructuring or following foreign investment, start contracting with the farms and rural households and provide basic inputs in return for guaranteed and quality supplies. This process of interlinked contracting is growing rapidly in ECA agriculture and rural areas.

These private contract initiatives can be quite substantial. Empirical evidence indicates that they include farm management assistance, extension services, quality controls, farm input assistance programs,

trade credit, and even bank loan guarantees. The programs generate important improvements in the credit situation of the farms, as they contribute directly to improved access to finance (e.g., through trade credit), and indirectly as they improve contracting farms' access to loans from banks or external financial institutions (through loan guarantees, enhanced farm profitability, and improved future cash flows). Arguably, the transition disruptions and contract enforcement problems have been even more severe in the rural credit markets than in other markets. In combination, the direct and indirect effects of the farm-assistance programs create important benefits for the farms and households supplying to these companies: they lead to improved input access, productivity, product quality, and market access.

There is growing evidence that these processes have been an engine of growth in the agrifood supply chains of the most advanced ECA countries. For example, almost the entire sugar sector in Central and Eastern Europe is based on supply contracts that include farm-assistance programs. Similarly, recent productivity growth and quality improvements in the dairy sector in many Central and Eastern European countries is driven by processing company investments and farm assistance packages.

Yet, several important issues are unresolved in this process of vertical coordination (VC). Specifically, related to the *efficiency implications*, remaining questions include under which conditions such a process emerges spontaneously? Which are the key policy factors in this process? What is the role of foreign investment (FDI) in this process? What triggers beneficial spillover effects to other companies and suppliers? How general are these developments? Are they limited to certain subsectors? In which sectors is this process more likely to emerge? Does an optimal model of contracting exist? Are there ECA specific features of these VC programs?

Concerning *equity implications*,¹ key questions include whether this process of vertical contracting lead to the exclusion of small farms? Does the emergence of contracting with downstream companies lead to rent extraction of farmers by creating dependency?

Finally, several *policy issues* need to be addressed. Under which conditions does such a process emerge spontaneously? In other words, is it sufficient for the government to create the right environment for private

1. An issue which is important both from an equity and efficiency perspective but which will not be addressed in this report is general equilibrium effects. The process of contract-driven market development and productivity growth may cause important positive general equilibrium effects for poor households, in particular in those countries where agriculture makes up a significant share of output and employment.

investments in the food industry and agribusiness in order to set this process in motion? If so, which are the key policy factors in this process? How can government policies or interventions contribute to the emergence of these institutions and to desirable efficiency and equity effects?

OBJECTIVE, METHODOLOGY, AND ORGANIZATION

The objective of the study is to analyze VC in agrifood supply chains in ECA and to identify options for improved policies, institutions, and investments which Governments could make, and which the World Bank could support, in order to improve links in the agricultural marketing and processing chain and increase access of farmers to input and output markets. This is especially important in those countries where contractual arrangements are slow to develop. It is also important if farmers are to be lifted out of subsistence farming and into a modern agrifood economy.

The report draws upon existing literature² and a series of case studies and surveys implemented across several countries and (sub-)sectors in ECA agrifood supply chains in the framework of this regional study and other related studies.³ The combination of these case studies from a variety of sources, and the survey of already existing evidence, provides evidence across countries and commodities.

The report starts with a conceptual framework and a discussion of the role of VC in other countries. Then it reviews the developments in ECA countries and provides an explanation for these developments. The subsequent sections discuss key factors in these developments, and the equity effects. The last part of the report discusses the policy implications.

2. Previous studies on supply chain restructuring and contracting in transition country food chains include Gow and Swinnen (1998, 2001), Dries and Swinnen (2004), Hobbs et al. (1997), Gorton et al. (2003). There is an extensive literature on experience in other parts of the world, in particular the United States, the European Union, Latin America, South Asia, and Africa (see, for example, Glover and Kusterer, 1990; Key and Runsten, 1999; Van der Vorst, 2000; Hobbs and Young, 2001). There is also a related, mostly theoretical, literature that focuses on optimal contracting and interlinked markets in developing countries (see, for example, Bardhan, 1989; Bardhan and Udry, 1999 for overviews). A more recent strand of literature studies the impact of new grades and standards imposed in agri-food markets. Recent studies analyzing the effects of standards on developing country farmers include those by Spencer Henson, Steven Jaffee, and a series of papers as part of a World Bank study on standards in agri-food chains; and studies on modern retail chains in developing and transition country farmers, by Tom Reardon and various collaborators. Finally, a series of studies analyzes supply chains from a finance perspective, focusing on supplier credit as a source of finance for small farmers including recent studies by IFAD (2003) on East Africa and a series of studies organized for the World Bank by Renate Kloeppinger-Todd.

3. The studies are listed in annexes.

CONCEPTUAL FRAMEWORK

Vertical coordination may occur at various stages in a supply chain. Two common examples are between a processor and a farm from which the processor purchases produce, or between a farm and an input supplying company. VC can take various forms, which can be thought of as institutional arrangements varying between the two extremes of spot market exchanges (0) and full ownership integration (1). Within this 0–1 interval, there is a large variety of different forms of coordination and an equally vast literature trying to classify these various forms, and to explain them.⁴

An often made distinction, which is useful for our purposes, is between marketing contracts and production contracts. *Marketing contracts* are (verbal or written) agreements between a contractor and a grower that specifies some form of a price (system) and outlet ex ante. *Production contracts* are more extensive forms of coordination and include detailed production practices, inputs supplied by the contractor, quality and quantity of a commodity, and a price (system).

Key factors determining the use of various contracts or other forms of VC are the costs and uncertainties involved in the transactions, which themselves are affected by the economic and institutional environment, the need for transaction-specific investments, the frequency of interacting, and commodity characteristics such as its perishability and the costs of measuring characteristics.

A key factor is *asset specificity*. If buyers or sellers have to make ex ante investments that are specific to the transaction, they want to make sure that the transaction goes through. This encourages them to engage in contracting. Another motivation for contracting is *perishability* of commodities: if a product is highly perishable, suppliers are in a weak bargaining position after harvest and want to make sure ex ante that there is an outlet for their products. An example is the extensive use of contracting in processed vegetables. A related factor here is the *frequency* of interacting (e.g., daily deliveries versus once a year harvests). Frequent deliveries allow for better exchange of information, the build up of trust, and lower costs of noncompliance. Uncertainty over *product quality* or *reliability of supplies* also tends to induce processors to contract suppliers.

4. The basic explanations draw often on the seminal work of Ronald Coase and Oliver Williamson. However, in two recent surveys of the literature (Hobbs and Young, 2001; and Rehber, 2000) no less than seven different strands of literature are identified as being important to understand and explain those differences: transaction costs economics, agency theory, competency/capability models, strategic management theory, convention theory, life-cycle theory, and contract economics.

Another important factor is the *costs of monitoring commodity characteristics*. If commodity characteristics can easily be observed at the time of delivery (e.g., color), spot markets may work well. However, when superior characteristics cannot easily be observed or tested, this may induce VC. For example, recent developments in food safety regulations and biotechnological advances may require not just testing of the product, but also extensive monitoring of the production process to guarantee product characteristics. Suppliers may also prefer such vertical integration if they need to make extra efforts or investments to obtain quality standards that are hard to observe in order to receive adequate rewards for their efforts and investments.

THE BENCHMARK: VERTICAL COORDINATION IN OTHER COUNTRIES

While there is an extensive literature on the theory of VC and contracting and a series of case studies, there is relatively little systematic empirical evidence, even for developed countries, such as the United States and the European Union.⁵ What is available shows (a) that VC is moderately important and (b) that it varies widely between sectors and countries.

North America and Western Europe

In the United States and in Germany, around one-third of the total value of agricultural production was produced under various types of contracts in the 1990s.⁶ Contracts were used mostly by larger commercial farms. Only 11% of US farms used contracts in 2001 (see Table 1). However, more than 40% of commercial farms used contracts. In terms of output, 13% of small farm output was under contract, while the commercial farms contracted for more than 40% of their output.

Marketing contracts were more widespread than production contracts: almost four times as much farms used marketing than production contracts (double as much for commercial farms). However, in terms of share of output, production contracts were almost as important as marketing contracts.

5. Interestingly, the need for better and more precise information on this issue is also felt in countries as the United States. The Canadian government (AgCanada) recently produced a report on vertical linkages in the agri-food supply chains in Canada and the United States (Hobbs and Young, 2001). The USDA/ERSAQ6 just published a major study on contracting in US agri-food chains (MacDonald et al., 2004). A set of US academic experts are currently working with USDA/ERS to develop a database on contracting in US agriculture.

6. Rehber (2000), based on Perry et al. (1996).

TABLE 1. Importance of Contracting in US Agriculture, 2001

	All farms	Rural residence farms	Intermediate farms	Commercial farms
<i>Percentage of Farms</i>				
Production contracts	2.4	0.5	2.1	15.2
Marketing contracts	9.1	3.2	14.2	29.2
Either contract	11.0	3.6	16.0	41.7
<i>Percentage of Output Value</i>				
Production contracts	16.0	5.0	6.1	20.0
Marketing contracts	20.3	8.3	18.0	22.1
Either contract	36.4	13.3	24.2	42.2

Source: USDA.

The main reason is that different commodities use different contracts. Production contracts are important in some of the livestock sectors and especially in hogs (54%) and poultry and egg production (81%). Marketing contracts are mostly used in crops: more than half of cotton and fruits were produced under marketing contracts. Other studies indicated that also in potatoes and sugar beets marketing contracts are very important.

Contracting is not very important in grains, with the exception of malt-ing barley which is mostly under marketing contracts. The USDA data in Table 2 show that more than 52% of dairy production is under marketing contracts. However, this likely includes contracts between farmers and their cooperatives as more than 80% of milk was sold to or bargained for by dairy cooperatives in the United States.

TABLE 2. Importance of Contracting by Commodity in the United States, 2001

	Either contract	Marketing contract	Production contract
Corn and soybeans	11.0	10.9	0.1
Wheat	5.6	5.5	0.1
Barley*	19.3	—	19.3
Cotton	51.7	51.7	—
Fruit	59.0	56.5	2.5
Vegetables	36.9	30.0	6.9
Cattle	20.9	3.2	17.7
Hogs	60.5	7.1	53.4
Poultry and eggs	88.1	6.8	81.3
Dairy products	53.1	52.2	0.9
All commodities	36.3	20.3	16.0

*1997.

Source: USDA.

Developing and Emerging Economies

In developing and emerging economies, VC and contracting is different in terms of its nature and to some extent also in terms of the commodities where it is important. In Latin America, contracting is important in the production of, for example, sugar, fruits and vegetables (F&V), broilers, malt-ing barley, and in dairy production (Dirven, 1996). In Turkey, beet sugar processing and the commercial part of broiler production (about 40% of total) as well as most processed vegetables were based on contracting between farms and processors (Rehber, 2000).

In these countries, contracting plays an important role in providing inputs to farms. Sometimes this is through interlinked contracts with landowners or by agribusiness contracting with farms. For example, a recent study by IFAD (2003) found that input credit provided by agribusiness companies with interlocking arrangements to buy the smallholders' crops under farming contracts is an important institutional arrangement in several countries in East Africa. In many cases, input and credit assistance is limited to basic inputs such as fertilizer, seeds, or working capital.

THERE IS MORE, AND MORE COMPLEX, VERTICAL COORDINATION IN ECA

Empirical evidence (which is documented in more detail in Annex 1) shows that the pattern of VC in transition countries differs from these observations in rich and poor market economies in several aspects. First, there is significant VC in sectors where we do not observe VC in Western Europe and North America. Second, the nature of VC in ECA is more similar to that in developing and emerging countries; however, VC in several transition countries is more extensive and more complex.⁷

At the end of the 1990s, in the Czech Republic, Slovakia, and Hungary, 80% of the corporate farms, who dominated farm production in these countries, sold crops on contract, and 60–85% sold animal products on contract; numbers that are considerably higher than the shares of even commercial farms in the United States.

A survey of agrifood processors in five CIS countries (Armenia, Georgia, Moldova, Ukraine, and Russia) found that food companies that used contracts with suppliers grew from slightly more than one-third in 1997 to almost three-fourths by 2003. There was also a strong growth in company ownership of farms. Enterprises directly engaged in

7. Only in some postliberalization emerging economies, such as in Latin America and South Asia, do studies suggest some similar developments.

farming increased from 6 to 26% of all interviewed firms—with most of this vertical ownership integration occurring recently. There is a significant growth of supplier support measures as part of the contracts and more farms are getting access to these. Monetary credit, prompt payments, transportation, physical inputs, and quality control are the most commonly offered forms of support. In 2003, over 40% of processors in their sample offer credit to at least some of the farms that supply them and 36% offered inputs.

Key findings from analyses of various commodity sectors—of which more details are given in section “Sectoral analyses”—also show more extensive contracting in ECA than elsewhere:

- In the dairy sector, there is no production contracting in countries like the United States. We observe extensive production contracts between dairy processors and farms in ECA, including the provision of credit, investment loans, animal feed, extension services, bank loan guarantees, etc.
- In the *sugar* sector, we find, as in the developed economies, extensive marketing agreements, but the contracts are much more extensive in ECA, 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 the *cotton* sector, the standard model in the United States and Australia, two major cotton producers, is that the cotton (from seed to baled cotton) remains in ownership of the producer and the processing is paid for as a service. In ECA, the dominant player in the chain is the gin who typically contracts farms to supply seed cotton and provides them with a variety of inputs. This model, which has developed in some of the poorer ECA countries 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 ECA, with credit, seeds, irrigation, fertilizer, etc. being provided by the gins.
- In the *fresh fruits and vegetables* (FFV) sector, 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, includes 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.

- In the grains sector, there is extensive and full vertical integration in Russia and Kazakhstan, where large agroholdings and grain trading companies own several large grain farms in some of the best grain-producing regions.

Interestingly, ECA seems to be lagging in those areas where VC is most developed in the West, such as intensive hog, poultry, and egg production.

To understand the reasons for these differences, their likely developments, and the implications, it is crucial to see these developments as an integral part of the process of transition, a process that involved a major change in the institutions governing exchange and enforcement of contracts.

THE DISRUPTION AND REORGANIZATION OF SUPPLY CHAINS IN TRANSITION

A major problem in the ECA agricultural sector and rural areas was the breakdown of the relationships of farms with input suppliers and output markets during transition. The simultaneous privatization and restructuring of the farms and of the up- and downstream companies in the agri-food chain has caused major disruptions.

Widespread forms of contracting problems during transition were long *payment delays* or *nonpayments* for delivered products (see Box 1). Such payment delays caused major drains on much needed cash flow for suppliers. This was a major problem for all companies in the food chain. Also, food processing companies in Eastern Europe in the late 1990s considered late payments one of their most important obstacles to growth (Table 3). In a survey, companies ranked it as the most important obstacle to company growth in Czech Republic and Slovenia, and the third most important (out of 12) obstacle in Hungary. Considering that these are some of the most advanced transition countries, one can imagine that this problem was at least as important in others.

Also farms breach contracts. Guaranteed supplies of quality raw materials are crucial for processors. In transition countries, processors often have severe problems in obtaining sufficient quality supplies. Suppliers may not deliver the quality or quantity of raw materials agreed to. The problems are worsened by the lack of public institutions necessary to support market-based transactions, such as for enforcing property rights and contracts.

As a result of these and other exchange disruptions, companies lacked reliable supplies of quality deliveries while farms faced serious con-

TABLE 3. Importance of Various Barriers to Growth for Food Processors in 1998

Type of barrier	Average survey scores (1–4*)		
	Czech Republic	Hungary	Slovenia
Exchange rate instability	2.16	2.52	2.04
Inflation	2.41	3.17	2.69
The level of interest rates	3.19	3.15	2.77
Access to credit	2.45	2.43	2.38
Activities of organized crime and gangster	1.58	2.03	1.73
Government price controls	1.74	1.57	2.67
Other government intervention	1.25	2.62	2.67
Your company having high levels of debt	2.48	2.02	2.23
<i>Late payment by customers</i>	3.44	2.70	3.54
Enforcement of bankruptcy laws	2.10	1.29	2.21
Activities of state monopolies	1.90	1.91	1.83
Problems with privatization	1.61	1.49	0.94

*1 describes “no problem,” 4 describes “a major barrier.”

Source: Gorton et al. (2000).

straints in accessing essential inputs (feed, fertilizer, seeds, capital, etc.) and in selling their products.

In the absence of appropriate public institutions, private contractual initiatives, often from large food and agribusiness companies, have emerged to overcome these obstacles. Traders, agribusinesses, and food processing companies, often as part of their own restructuring, start contracting with the farms and rural households and provide basic inputs in return for guaranteed and quality supplies.⁸ The evidence in this report shows that this process of VC is growing.

As a result of supply-chain restructuring and VC, these exchange and payment problems have often been importantly diminished in the most advanced ECA countries. However, in many countries problems of payment delays continue until today, even in some of the European transition countries. A survey of Polish pig farmers in 2004 found that problems with payments by contractors were their second most important problem (Wilkin et al., 2004). Another illustration is from the following quote: “Romanian farmers are holding back supplies of milk as they are experiencing considerable delays in being paid by processors and other buyers. Many farmers have to wait more than two months to be paid for their

8. Interviews with agrifood companies suggest that one of the first actions new investors undertake as part of a company restructuring is to pay suppliers on time.

BOX 1

Contract Problems in Transition⁹

The widely observed phenomenon of farms not being paid, or much too late, for delivered products is an example of a contracting problem what is called a “hold-up” in the economics literature. In simple terms, it means that once a farm has made an investment for supplying to a processor, it weakens its bargaining position if the processor tries to renegotiate the contract.

Consider the case of a farm sugar beet producer. Before the farm invests in seeds, etc. it will discuss with the sugar company the price and conditions of delivery (time, sugar content, etc.). The farm can then decide to produce sugar beet, or produce something else. However, once the farm starts with the beet production and invests in seeds, labor, fertilizer, pesticides, etc., the farm is in a weaker bargaining position. It cannot undo the investments already made and therefore may be forced to accept a worse deal if the company does not honor its commitments: a “hold-up”!

The danger of a hold-up is more acute when there are less alternative options for the farm to sell its product. In this case it is said that the investment is “relationship specific”. This is more likely for products which are perishable or which require processing (such as sugar beet) than for commodities which are storable or for which alternative uses exist (such as grains). For the same reason, the availability of competition in the processing sector reduces the likelihood of hold-ups.

When the farm realizes the likelihood of a hold-up, it will refrain from making such relationship-specific investments unless there are ways to protect itself. Such ways are, e.g., contracts which can be enforced by institutions, such as courts, or trust which has been built up over several years of contracting, or the reputation of a company.

Notice that it is also possible that processing companies are held up by farms. This is, for example, the case when processors need a minimum amount of supply of a certain quality to make an investment profitable. Once the company makes such investment, it is subject to hold-ups by suppliers who may refuse to deliver unless they get a better deal.

milk. Some started bringing milk into towns themselves as they will get their money immediate” (AgraFood East Europe, March 2003, p. 23).

MULTIPLE MODELS AND MOTIVATIONS

Our findings suggest that empirically successful models are commodity specific, transition-stage specific, heterogeneous (varying from rather

9. Based on Gow and Swinnen (2001). For examples and economic analyses of contracting and hold-up problems, see Klein et al. (1978), Williamson (1985), Milgrom and Roberts (1992), Klein (1996), and Gow and Swinnen (1998).

simple to complex), and often “nontraditional”¹⁰ because successful models address specific transition-related problems, some of which are not prevalent in a “normal market economy environment.” Part of these variations are determined by the same factors that determine variations in contracting in developed market economies, such as transaction cost differences and commodity characteristics (see above). However, and more importantly in the framework of this study, there are also transition-specific factors that affect the VC developments. To understand how these factors affect the development of VC, let us start with a simple framework of a farm (supplier) and a processor and then later look at some more complex examples and institutional developments.

The Basic Model

After the initial transition-disrupted supply chains, processing companies face a lack of quality supplies. There are several reasons for this. First, farms *may not be willing* to supply their output to the processor because they fear not being paid once they deliver the product. Second, if farms want to supply, they *may not be able to* because they cannot access basic production factors. Third, if farms want to supply, they *may only supply poor-quality supplies* because (a) they lack the necessary inputs to improve the quality and (b) they lack expertise and know-how for producing high-quality goods.

A strategy to address these problems typically involved some form of VC. Successful vertical contracting has taken many forms, but has typically included conditions for product delivery and payments as well as farm-assistance programs for suppliers. Typically, payment conditions imply immediate payment for delivered product. Farm assistance has taken many forms including, in some cases, input supply programs, investment assistance programs, trade credit, bank loan guarantee programs, extension and management advisory services, etc.

Finance

Once the company develops such programs, two conditions need to be fulfilled. First, the processor needs sufficient funds and cash flow to *finance* the supplier contracting system, including immediate payments and the assistance programs. Therefore, initiators of contracting with supplier financing include:

- Foreign investors who have access to financial means because they have “deep pockets” or because they can access financial markets

10. In the sense that they are not normally observed in market economies.

internationally (e.g., foreign/multinational processing companies active in dairy, sugar, oilseeds, etc.).

- Companies who made *money in other sectors* and are interested in investing these funds in the food sector (e.g., FIGs in Russia).
- Domestic processors or traders who sell on the *international market* and have sufficient turnaround to have financial liquidity (e.g., grain traders in Kazakhstan).
- Domestic processors who have links with the international finance through *contracts with international companies* (e.g., cotton gins in Central Asia).

Contract enforcement

Second, the processor needs to *enforce* the new contracting system. Enforcement problems are an integral aspect of VC. Enforcement is crucial to make any of the contracts or supplier-assistance programs sustainable. Enforcement is especially problematic in environments where public enforcement institutions are absent. These problems have been overcome in some cases, but in several cases enforcement problems have continued to plague the contracting, sometimes leading to failure of the VC. In section “Enforcement is difficult but essential,” we will discuss contract enforcement problems and solutions in more detail.

Variations on the Basic Model

Vertical coordination, both in terms of its type and its extent, differs obviously by commodity, as the commodity and process characteristics affect transaction costs in the exchange. They may also include different companies than just the farm and processor. Annex 2 presents a variety of empirically observed models of VC. These include:

- *Triangular structures* where processors and retailers work with banks, e.g., via loan guarantee programs, to reduce financial constraints of suppliers. We found examples of this in the sugar sector in Slovakia, the retail sector in Croatia, and the dairy sector in many countries (see Boxes A2.1–A2.3 in Annex 2).
- Vertical coordination with *multiple stages* is the case, for example, with some brewery investments (where breweries vertically coordinate along the brewing-malting-farm-input supplier chain) or some cotton chains (Box A2.5 in Annex 2).
- Sometimes different models are developed because processors themselves do not have access to finance and *other agents in the chain drive the VC*. For example, we found several cases where input suppliers,

banks, local, and international traders vertically coordinated with the farms as processors did not have the financial means.

- In some cases, processing or trading companies take *ownership* over the farm and fully integrate it in their company. For example, in Russia and Kazakhstan, traders and processing companies own many farms. Large, vertically integrated grain companies are the dominant types of farming in the north of Kazakhstan (Box A2.6 in Annex 2). They use tens of thousands hectares of farming land.
- Vertical coordination in Russia has grown rapidly since 1998, but the Russian forms of VC are profoundly different from those discussed above as in several cases it was the state (or politicians) that were the driving force behind the VC (Gataulina et al., 2004). After the 1998 Russian financial crisis, local authorities encouraged Russian companies to invest in the agrifood system by offering privileges and guarantees. Large industrial holdings became large agricultural holdings as well. The vertical integration process is most active in the Belgorod and Orel regions where a large share of all agricultural enterprises are part of such integrated companies, often farming more than 100,000 hectares (see Box A2.7 in Annex 2).

Another somewhat different motivation for vertical integration that is mentioned in some reports is *tax incentives*. However, in themselves, tax considerations seem to be a poor motivation for engaging in farming by companies with little experience in farm management. Either these initiatives fair poorly or are only one of the motives.¹¹

Vertical Coordination Varies by the Stage of Transition

In the *early stages* most of the emphasis in VC is on *securing supplies*. Therefore, most emphasis goes to overcoming basic supply problems, such as input (feed, seeds, etc.) and credit (working capital) constraints. This is still the case in some of the cotton supply chains in Central Asia and in

11. This was apparently one of several motivations in Russia where some FIGs invested in agricultural production and where taxes were lower for companies having a minimal share of their output in agriculture. They responded to this (and other) incentives by vertically integrating, and becoming active in farming itself to benefit from these tax advantages. The same is reported for Ukraine, where vertical integration in the oilseed crushing industry was stimulated by the favorable tax regime of the agricultural sector (EBRD, 2002, p. 23)—although important problems have constrained, and even reduced, vertical coordination between processors and farms. For example, the EBRD report stipulates that tax incentives were only one reason and seed supply concerns were another, possibly more important, motive for the Ukraine oilseed industry to integrate with farms. Also in Russia, other motivations seem to have induced nonagricultural companies to get involved in farming. (See section on Russian Vertical Coordination in Annex for more details.)

emerging dairy and F&V supply chains in countries such as Romania and the Caucasus.

An important component of the contracts is prompt payments. White and Gordon find that 90% of farms get prompt payments in the first year of contracting in their study across five CIS countries. Similarly, other studies on early stage VC, such as dairy in Romania in 2000 or sugar processors in Slovakia in the mid-1990s, all start with the introduction of prompt payments.

In *more advanced situations*, as is the case in many sectors in Central Europe, there will be more *emphasis on product quality*. For this, more sophisticated forms of VC are needed, such as extension services and farm-level investments in technology and equipment, leasing, bank loan guarantees, investment assistance, etc.

These latter assistance programs require much more sophistication and more complex implementation and enforcement systems. Interestingly, these advanced assistance programs are less widespread in CIS countries than in CEE countries, which more advanced in the process. These programs are also apparently not found in developing country VC strategies. Studies on VC in other regions, such as the IFAD (2003) report on East Africa and Key and Runsten (1999) on Latin-America, do not mention such sophisticated measures. This may reflect the lower quality standards for supplies in these regions, or larger problems of enforcement for such programs, or both.

The different contract forms in different regions and at different stages of transition may also reflect *different constraints faced by farms*, as reforms and their effects impact on the constraints in input and output markets. For example, Table 4 shows how the dominant motivation for farms in Central Europe (Hungary, Slovakia, and Czech Republic) at the end of the 1990s was guaranteed access to markets (52% of the farms listed this as their primary motive) and to a lesser extent guaranteed prices (21%). For

TABLE 4. Contract Motivations for Farms in Central Europe

Most important reason for contracting	Czech, 1999	Slovak, 1999	Hungary, 1997	Average
Contract price higher	9	8	10	9
Avoid price uncertainty	7	22	33	21
Guarantee product sales	64	50	43	52
(Part) prepayment	7	13	3	8
Easier to get credit	0	0	9	3
Contract—inputs and TA	7	6	2	5
Other	6	2	0	3

Source: Leuven ACE datasets.

a very few, access to credit or other inputs was the main motive. The farms in Table 4 are mostly large farms as they are the dominant contractors.

However, the motivations for small cotton farmers in southern Kazakhstan to enter into contracts with gins are very different. For them credit constraints are by far the most important constraint still in 2003, as is clearly reflected in the survey results in Table 5. Financing of inputs also played an important role in the emergence of very large integrated grain companies in northern Kazakhstan. Grain-trading companies first introduced prefinancing for farms in the northern Kazakh grain belt. However, with increasing defaults and bankruptcies, the grain companies ended up taking over the farms to reduce the risk of nonrepayment.

An important additional benefit from vertical integration was the increased bargaining power of the integrated grain farms vis-à-vis local and regional authorities, who continue to intervene in farming operations (Gray, 2000). These advantages were particularly important in the grain sector in Kazakhstan where most farms continued to depend on the local authorities for access to key inputs (such as seed and fuel) and for financing of these inputs, and where the authorities used this dependency to influence farm decision-making.

TABLE 5. Contract Motivations for Cotton Farms in Kazakhstan, 2003

Reason for contracting (%)	Yes	No	Most important reason
Guaranteed product sales	9	91	8
Guaranteed price	4	96	3
Access to prefinancing	81	19	75
Access to quality inputs	11	89	10
Access to technical assistance	0	100	0
Other	4	96	3

The progress from simple to more complex assistance programs reflects also the *stage of development of contracting between processors and suppliers*. Assistance programs start off simply and then gradually become more complex as (a) reforms progress in the countries and (b) as the processors learn from their experiences and the local situation.

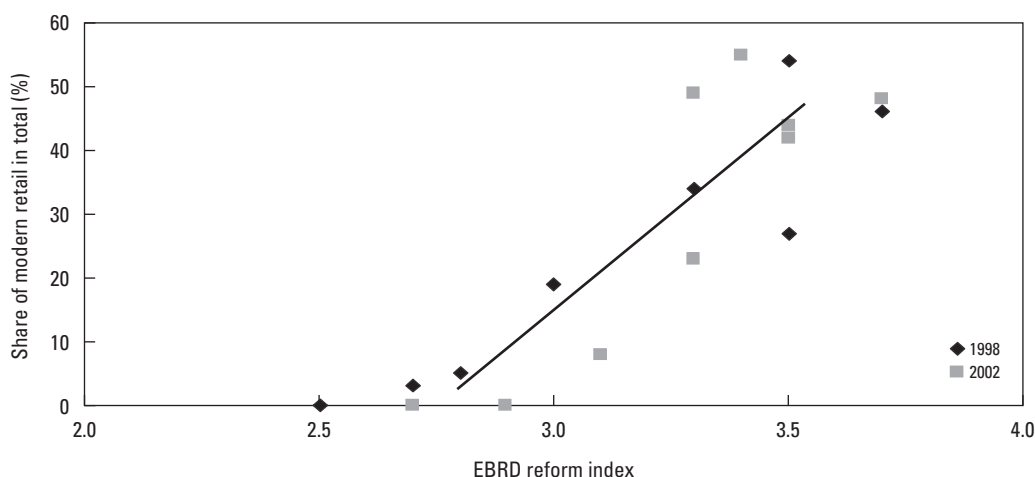
Not only assistance programs may change, but the organization of the supply chain may be entirely restructured. For example, in the case of modern retail investments, important changes in procurement systems occur step-by-step in the supplier-retailer relationship. These changes include: (a) a shift from local store-by-store procurement to nationally centralized big distribution centers; (b) an incipient shift to regionalization of procurement over countries; (c) a shift from the use of traditional bro-

kers to new specialized/dedicated wholesalers; (d) increasing local use of global multinational logistics firms; (e) a shift to preferred supplier systems; (f) a shift to high private standards of quality and safety. These changes dramatically change the contracting relationships between retailers and suppliers.

CONSTRAINTS ON VERTICAL COORDINATION IN ECA

Several factors may prevent the *emergence* of VC. First, if there are no problems with securing quality supplies, there is no reason to introduce VC. This is the main reason why there is no VC by supermarkets in, e.g., the Czech Republic and Slovakia, where fruit and vegetable suppliers are mostly large farms, better able to deliver good quality, and to finance investments themselves. In contrast, in Croatia and Serbia, where food and vegetables suppliers are mostly small farms, supermarkets have introduced input assistance and supplier investment support (Reardon et al., 2003a; Dries et al., 2004).

FIGURE 1. Impact of Economic Reforms on the Growth of the Modern Retail Sector in ECA*



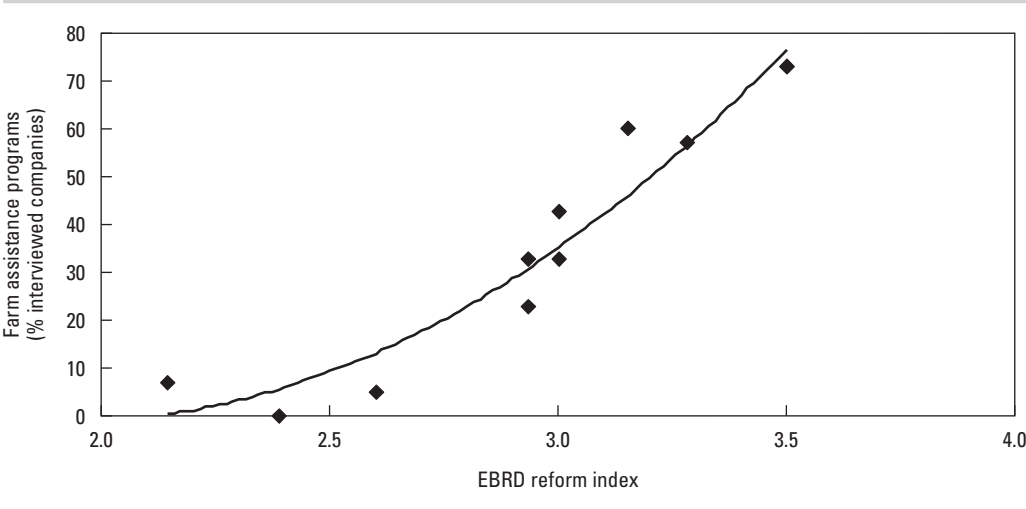
* Correlation (R^2) is 0.79. Data include Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, Ukraine.
Source: Dries, Reardon and Swinnen, 2004

The second reason why VC may not emerge is because of lack of investments in food processor companies, which are typically a precondition for VC to emerge. The absence of foreign or domestic investments may be due to a variety of reasons.¹² However, typically it reflects political or

12. See, e.g., the 2005 World Bank report on "Improving the Investment Climate."

economic instability, insecure property rights, and the absence of key reforms. Several studies confirm that poor government policies are a major constraint for investments.¹³ This is also illustrated by Figures 1 and 2, which show a very strong positive correlation between reform progress in transition countries and investments by multinational retailers (see Figure 1) and VC by dairy companies (see Figure 2).

FIGURE 2. Impact of Economic Reforms on Farm-Assistance Programs in the ECA Dairy Sector*



* Data include observations from Albania, Bulgaria, Poland, Slovakia
Source: Dries and Swinnen (2005)

Third, VC may not develop even if investments take place, due to problems of contract enforcement (see section “Enforcement is difficult but essential”). For example, in the Ukrainian oilseed sector, prefinancing from crushers to farmers has decreased markedly since the late 1990s, after crushers experimented with prepayment for seeds, but many had their fingers burned with significant defaults (EBRD, 2002). This factor may also be captured by Figure 2, which illustrates the strong effect of reforms on VC as key reforms are needed to facilitate contract enforcement.

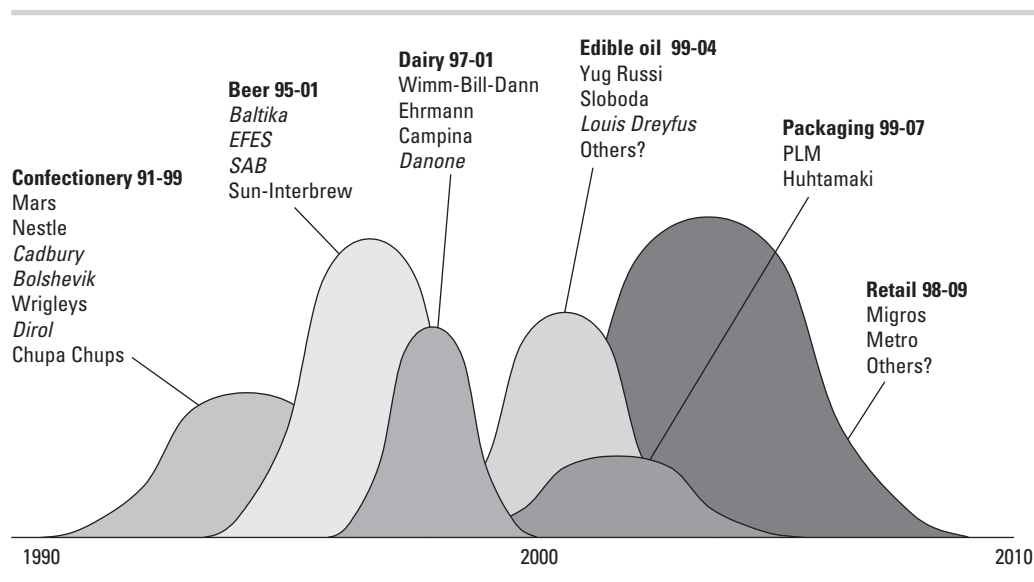
Fourth, investments in the agrifood chain tend to come in “waves.” This is illustrated by Figure 3, which shows how investments in confec-

13. For example, Codron et al. (2004) show how legal constraints on foreign investment limited FDI in the retail sector in Morocco until very recently. Similarly, foreign investments in the food industry in Slovakia, a country with many characteristics similar to the Czech Republic, Poland, and Hungary, was much less than in the neighboring countries because political instability and lack of consistency in reform under the Meciar government in the 1990s drove investors away. After the change of government in 1998, FDI in dairy (and other sectors) picked up rapidly.

tionary and breweries have preceded investments in dairy and edible oil processors in Russia. The latest wave is the retail investments. Hence, even if reforms are implemented, not all investments will come at the same time.

Fifth, like the investment waves discussed here, there are also VC “waves.” *Processors* first focus on securing supplies and later start working on upgrading the quality of the supplies. *Retail chains* also go through several steps in developing and upgrading their supply chains, going from wholesale markets to preferred supplies schemes and moving to distribution centre and cross-border supply systems. For example, one can distinguish two phases in the transformation of the ECA retail system, with different types of vertical relationships with supplying farms: an (early) *transition phase* when privatization and market liberalization took place; and a later *globalization phase* when major investments in the retail sector by multinationals take place.¹⁴

FIGURE 3. Investment Waves in Russia



Source: EBRD

14. Countries such as the Czech Republic, Hungary, and Poland are “first wave countries” in terms of retail transformation, starting the globalization period around 1996. Some Balkan countries such as Croatia, Romania, and Bulgaria are part of a second wave, where retail globalization started in the late 1990s. In a third wave of countries, including Russia and Ukraine, retail globalization did not really start until 2002, but is growing very rapidly now. In 2003 and 2004, Russia was the top destination for global retail investments (Reardon and Swinnen, 2004).

Sixth, growth of VC comes when VC programs spread to other companies, other suppliers, and even to other sectors. The main engine behind this is imitation and competition. Once one company introduces successful VC programs, either competitors copy these programs or suppliers shift to such processors. This competitive pressure for suppliers induces an expansion of VC programs even across sectors—as farms may shift crops to access VC assistance.¹⁵

In summary, the emergence of VC will depend on the level of reforms in a country, other characteristics which affect private sector investment, the functioning of the rural factor markets, and sector specific characteristics.

CONTRACT ENFORCEMENT IS DIFFICULT BUT ESSENTIAL

Enforcement is crucial to make any of the contracts or supplier-assistance programs sustainable. Enforcement is especially problematic in environments where public enforcement institutions are absent. Evidence suggests that court enforcement of contracts is generally not efficient; even approaches based on collateral are often flawed because either farms cannot provide the necessary collateral or collecting in on the collateral is problematic in many circumstances in transition.

In such environments, the best one can do is create *self-enforcing contracts* by designing the terms of the contracts such that nobody has an incentive to breach the contract (see Box 2). This can be done by increasing the costs of breaching the contract or by introducing flexible terms that reduce the chance of breach in case conditions change unexpectedly.

However, this is not a simple exercise. An illustration of the problems of setting up self-enforcing contracts is from an FAO project in Macedonia. The project attempted to create markets for vegetable farms by contracting between farms and processors/traders. A large number of farms and processors joined the project, but many contract breaches occurred, on both sides: “Quantities and quality of products delivered to the processors did not meet expectations, since contracted farmers sometimes preferred selling on (high-price) fresh markets and supplied processors with products they were not able to sell on the fresh market. In some cases, this caused processors, who target quality product niche markets, to reject the delivered goods. [On the other hand], some processors did not honor

15. There is considerable evidence on this growth process in the reports on investments in Croatian supermarkets (Reardon et al., 2003a), in the Polish dairy (Dries and Swinnen, 2004), in Bulgarian dairy (Noev et al., 2004), in the Kazak cotton sector (Sadler, 2004) and in the CEE sugar sector (Gow et al., 2000).

the signed contract because they failed in identifying export markets” (Martinovski, 2004, p. 6).

There are many stories of enforcement failure. In some cases this caused the cancellation of the VC program. For example, Gow and Swinnen (2001) report cases of an international dairy company in Romania and an international brewing/malting investment project in Croatia, which ended up canceling their input prefinance program as farms continuously diverted the inputs for other uses. In other cases, foreign investors left after they failed to obtain sufficient quality of raw materials from their supplying farms, despite extension, training, and support programs, as suppliers regularly sold produce to other companies or traders.¹⁶

Even in the successful cases it took considerable fine-tuning of the contracts over time to make the contracts self-enforcing. In addition, circumstances change so rapidly in transition that contracts required continuous adjustments as the self-enforcing range itself changes. Creating the right conditions for successful and self-enforcing contracting requires extensive knowledge of the sector and of local conditions and an ability to flexibly adjust the contract terms to circumstances that can change rapidly in transition.

Institutional innovations to ensure supplies for processors or payments for input suppliers also help to enforce contracts. Effectively, what companies do is interlinking markets. The enforcement of the credit transaction (loan and repayment) occurs through the output market. Yet, whether this is sufficient as an enforcement mechanism depends on a variety of factors, and, as the evidence shows, it may not always be sufficient.

Ultimately, the best way of solving the exchange, contracting, and collateral problems in transition countries is to base exchanges and contract enforcement on *trust*. Unfortunately, due to traumatic experiences during both the communist and the transition periods, trust is generally lacking as a base for business exchanges in many transition countries. However, empirical evidence does suggest that once companies are able to successfully instigate new contractual exchange forms, trust as a basis for business exchanges can develop relatively rapidly. An interesting example of such trust-based lending to suppliers is the ISPA/Promilch project in Romania where a dairy company collaborates with a farmers association to provide loans to small farmers without collateral (see Annex 2 for details). Hence,

16. This is not unique to transition countries. Enforcement of supplier contracts with assistance programs is a major problem in other regions as well, as, for example, illustrated by the IFAD (2003) report on supply chain finance in East Africa.

BOX 2

Private Contract Enforcement and Self-Enforcing Contracts¹⁷

Enforcing contracts through courts is sometimes not viable due to a combination of litigation costs, ineffective contract law, poor third-party verifiability, and the potential loss of the only suitable trading partner for that commodity. This is especially true in transition economies. For example, in a 1999 survey of Polish hog farmers, more than 60% believed they could not use courts to enforce contracts with their most important customer (Beckmann and Boger, 2003).

In this situation, contracts may be enforced without legal institutions by including flexible conditions to anticipate market changes and by including sufficiently large private sanctions. Private sanctions include both the losses that result from termination or nonrenewal of the business relationship and from reputational losses, including increased costs of doing business in the future.

To understand how this way can be effective, it is important to understand that typically, when there are no changes in factors that affect the contract conditions, there will be no contract breach—otherwise rational partners would not have agreed to the contract in the first place. However, if important changes occur in the market environment, it may become interesting for some partner to breach the contract. Consider the case when a farm and a processing company agree up front on a price to be paid by delivery of the commodity. Say, the contract price is set at the expected market price. However, the actual market price may deviate from the contracted price. If the market price is higher than the contracted price, the contract provides unanticipated benefits to the processing company, but is costing the farm, since it could sell its products at a higher price on the market. The farm will compare the costs of staying with the contract (i.e., the losses it incurs by selling at a lower contract price than the market price) with the costs it would incur from breaching the contract. As long as the costs of contract breach are larger, the farm will continue to supply. However, if market prices increase sufficiently, it may become beneficial for the farm to breach the contract and sell its products to another company that pays the market price. Inversely, if the market price falls below the contracted price, the farm gets unexpected benefits from the contract, and the processing company has to pay more than if it would buy the commodity at the market. Now the processing company considers whether it would honor the contract or not.

Hence, as long as the market price varies within a certain range around the contracted price, the contract will be honored by both parties. This range is called the “self-enforcing range” of the contract. More generally, the self-enforcing range measures the extent to which market conditions can change without precipitating a hold-up by either party. As long as the relationship remains within the self-enforcing range where each transacting company’s benefits of a hold-up are less than the costs, a hold-up will not occur.

17. Based on Gow and Swinnen (2001).

the problem seems to be primarily to “get the thing going initially” and enforcement costs may decline over time.

SECTORAL ANALYSES

Dairy Sector

Dairy companies played an important role in the restructuring of the dairy farms. Assistance programs that dairies offer to their suppliers help farmers gain access to capital, make investments, and upgrade the quality of their deliveries. Table 6 shows the forms of investment assistance being offered by dairy companies to their suppliers in each country in Poland, Slovakia, and Bulgaria, based on a series of interviews in the three countries with quite different farm structures and at different stages of transition.

In *Poland*, each of the six interviewed dairies has an input supply programs in which they provide access to inputs such as feed (or seeds and fertilizers for on-farm feed production). Five out of six companies assist farm investment through credit programs. Most of the companies also provide extension services to their suppliers. Five of the dairies provide guarantees on bank loans made to farmers, most of which include preferential interest rates. Most interviewed dairies also co-sign bank loans when farmers lack sufficient collateral.

In *Slovakia*, all of the six interviewed dairies assist farms through credit programs for dairy-specific investments. Three of the six interviewed companies assist their suppliers in accessing inputs. Most of the companies also provide extension services. Three of the dairies provide guarantees on bank loans made to farmers. The respondents indicated that they offer these types of programs in order to upgrade milk quality and

TABLE 6. Share of Interviewed Dairy Companies Having Assistance Programs (in %)

Year	Country	Credit	Inputs	Extension	Veterinary	BLG	Total
1994	Poland	50	67	50	0	50	43
	Slovakia	0	0	83	17	27	23
	Bulgaria	9	18	9	0	0	7
1998	Poland	83	100	83	17	83	73
	Slovakia	17	17	83	17	33	33
	Bulgaria	45	64	18	18	18	33
2002	Poland	83	100	83	17	83	73
	Slovakia	100	33	83	17	50	57
	Bulgaria	82	91	73	18	36	60

BLG, bank loan guarantees.

Source: Dries and Swinnen (2004).

to secure their supplier base against loss to other dairies who do offer these valuable services.

Even in *Bulgaria*, the country least advanced in reforms and transition and which displays the lowest degree of VC, most of the 11 interviewed dairies offer assistance to their suppliers. Nine companies assist farms through credit programs for dairy-specific investments, with two of these indicating that they also offer credit for general investments. Ten of the selected dairies assist their suppliers in accessing inputs for on-farm feed production. The majority also provide extension services. Five out of the 11 companies offer bank loan guarantees. Securing the supply base is indicated as the main reason for offering these programs in almost all cases.

The share of companies offering assistance has increased in all three countries. Dairy companies in Poland implemented assistance programs quickly. In Bulgaria, the number of dairy companies offering assistance increased gradually. In Slovakia, the increase in assistance accelerated after 1998, consequent with increased inflows of FDI.¹⁸ Programs initiated through the use of FDI may have forced local dairies to implement assistance programs in response to increased competition as well as providing examples for local dairies to emulate.

Two countries that are even less advanced are Romania and Azerbaijan. Both are characterized by small-scale dairy farms and domination of street sales of milk.¹⁹ However, since 2000, there have been major changes in Romania, where growing FDI has induced important changes. VC and contracting has developed rapidly importantly with FDI. Interviews show that the large dairy companies contract with small and large farms and offer their farmers assistance programs. Improving milk quality and securing the milk supply base are the major reasons behind offering these assistance programs. Extension services include support to farmers from making feeding plans for their herd, how to increase milk quality, cleaning practices, and also full business plans. Several dairies provide pre-financed inputs and medium-term investment credits. However, except for the dairy owned by a farmers association, other dairies offer these services mainly to larger farms.

18. In particular, Slovakia's agrifood industry restructuring was held back by the lack of foreign investment due to poor government policy credibility until the late 1990s. Bulgaria was even further behind in the reform policies.

19. In Romania over 95% of all farms have one to two cows. Only 20–25% of the milk production is processed. Farm use and direct sales on street markets are the main outlets. The processing industry is very fragmented; there are around 550 dairies of which 250 have a capacity of less than 1000 ton/year. The six largest dairy companies account for 25% of dairy processing. In Azerbaijan, dairy farms are also small and less than 10% of the dairy products sold on the market are processed by the industry. Most of the products are sold directly from the farmer to the customer.

No such change has occurred in Azerbaijan due to the absence of FDI. Vertical linkages are almost nonexistent in the dairy markets, and the local industry remains weak. A particular problem of the Azeri production system is the lack of basic infrastructure such as reliable energy supplies. Regular electricity disruptions in rural areas prevent investments in basic mild cooling and processing equipment.

In summary, these findings for the dairy sector support key hypotheses that (a) VC is growing in the ECA region; (b) that its emergence is strongly influenced by reform policies; and (c) that VC starts first with input support, extension, and simple credit programs; later more sophisticated programs, such as bank loan guarantees and investment loans, are developed; (d) that VC is very important in the most advanced ECA countries and that less advanced ECA countries will converge to this. Evidence from other countries and sectors largely confirms this picture.

Sugar

Like in the dairy chains, VC is also prominent in the restructured sugar (beet) chains in ECA countries where foreign investments took place in the sugar sector. By the end of the 1990s, 80–90% of the East European sugar sector was taken over by foreign investors, often in anticipation of high rents with integration of these sugar sectors in the highly subsidized EU sugar markets (see Table 7). Foreign investors have introduced a variety of farm assistance and contracting programs for sugar beet growers when they invested in sugar processing companies. Case studies by Gow et al. (2000) and others provide evidence of input and technical assistance programs, prompt payments policies, and finance assistance programs, including bank loan guarantees. These VC forms have been copied by domestic producers.

TABLE 7. Investment and Restructuring of Sugar Processing Plants in 1999

Country	No. of processing plants		Estimated # sustainable processing plants	% of Processing plants w/ FDI	% of Production capacity w/ FDI
	1989	1999*			
Czech Republic	52	10	5	70*	90*
Hungary	14	7	3	100	100
Lithuania	4	4	—	100	100
Poland	70	76	15	12*	>50*
Romania	33	17	10	50*	>75*
Slovakia	9	6	2	86	95*
Slovenia	1	1	1	100	100

*Estimates.

Source: Swinnen and Gow (1999).

Fruits and Vegetables

A study of five CIS countries agrifood sectors shows that VC is also important in the F&V sectors in these countries (White and Gorton, 2004). In contrast, a similar study on Azerbaijan found very little VC in the F&V market. However, this seems to reflect mostly the dire status of the Azeri food industry and its poor record in attracting FDI in the food industry. There is only a very modest amount of foreign investment in two of the agroprocessing plants, from neighbors in the region, particularly Turkey and Iran (Giovannucci, 2004).

In more developed ECA countries, FFV contracting is developing fast with modern retail investments. As we explained earlier, with supermarkets becoming more important outlets, a restructuring of the supply base, including extensive contracting, is taking place in the more developed ECA countries and is likely to spread to other countries in the region.

There are two motivations for contracting by supermarkets in FFV: securing high-quality supplies and securing year-round supplies. Examples of the first type of contract are those of a growing number of retailers in more advanced ECA countries (Dries et al., 2004). Retailers implement contracts with growers to procure higher quality produce. Codron et al. (2004) explain how contracts are designed to encourage the growers to make the specific investments required by such a transaction and to protect them from any opportunistic decision of termination of the contract by the retailer. Producers are eager to enter into such a contractual arrangement with a retailer.²⁰

A second reason for supplier contracting is to secure supplies throughout the year. An interesting illustration is from Turkey, where retailer Migros supplied the Antalya market with local contracts with tomato growers. The tomato packing unit is in Antalya where the tomato season is from September to June with a gap during the summer. Until recently, summer-harvested tomatoes were bought in northern Turkey. However, since no sorting facilities were available in that distant region, Migros contracted in 2002 with a whole village in the mountains nearby Antalya to grow 1000 tons of tomatoes during the summer period. Migros organized the sorting and packing operations directly in the village, as well as the transport (Codron et al., 2004).

20. Supermarket contracting to stimulate others to invest in new technology to increase the product quality is not restricted to farms. Codron et al. (2004) document how a retail chain in Turkey contracted with truckers to upgrade their transportation vehicles. Migros encouraged truckers (with whom it had been working for a long time) to form a cooperative as a framework for a collective contract. Contracts offered employment guarantees to truckers who made specific investments in refrigeration equipment.

Cotton²¹

A comparison of VC in the cotton supply chains in four Central Asian countries (Uzbekistan, Tajikistan, Kyrgyzstan, and Kazakhstan) shows that VC is widespread in each of the Central Asian countries. However, it takes on different forms due to the different reform approaches governments have taken; and the impact on farms has been very different. In Kyrgyzstan and Kazakhstan, farms have benefited from the reforms and the VC, with relatively high prices and strong cotton growth, while in Uzbekistan and Tajikistan VC resulted in major rent extraction of cotton farms, with depressed prices and stagnating cotton production (see Table 8).

What is remarkable is that in countries where the government has allowed the private gins to develop and compete, cotton farms are doing much better. In Tajikistan and Uzbekistan, where governments actively control (directly or indirectly) input supplies, production, processing, and marketing in the cotton chain, farm prices are considerably lower than in Kyrgyzstan and Kazakhstan where the private sector has taken on these roles. However, not all is perfect in the latter countries. In Kyrgyzstan, the influx of illegal finance in the cotton chain caused contract breaches and disruption of prefinance agreements between gins and international traders, with major negative repercussions throughout the cotton chain.

TABLE 8. Variations in Central Asian Cotton Production, 1992–2003*

Measure	Kazakhstan	Kyrgyzstan	Uzbekistan	Tajikistan
Annual growth rate				
<i>Harvested area (Ha)</i>				
1993–1998	12.3	6.0	–1.7	3.7
1993–2003	5.8	7.6	–1.7	–0.1
<i>Seed cotton production (1000 MTs)</i>				
1993–1998	26.7	11	–2.3	8.4
1993–2003	8.9	11.5	–2.8	0.1
<i>Baled cotton production (1000 MTs)</i>				
1993–1998	12.6	20.4	–2.7	0.4
1993–2003	5.4	25.9	–2.6	–3.5
Seed cotton				
Price per MT, 2003	\$550.00	\$450.00	\$200.00	\$165.00

Source: Based on Sadler (2004).

*There are significant differences in seed cotton production and baled cotton production. The most important reason for these differences is probably smuggling of seed cotton from Uzbekistan and Tajikistan to Kazakhstan and Kyrgyzstan, although there are no data to quantify the amounts of smuggled seed cotton.

21. See Sadler (2004) for more details.

Uzbekistan

Cotton exports are a major source of government revenue in Uzbekistan and the state has continued to impose strict controls on the cotton chain. Market reform has been slow. The government reinstituted a state monopoly on the purchase of cotton in 1995, with prices fixed at amounts based on estimated production costs. Officially, producers are required to sell 50% of production. In practice, they often sell their entire crop to the state because they have no financing options except to use government financing for cotton.

Vertical coordination is also controlled by the state. Nearly all gins remain under government ownership, and even the privately owned gins are subject to government control. Cotton producer financing is available through a single form of contracting offered by the state through the two main state banks. These banks provide loans in amounts dictated by the central government. Funds are automatically transferred out of a producer's account to repay these loans as soon as payments are received by the producer. Inputs are provided through a centralized system of state controlled enterprises. These enterprises give priority to large farms. Small private farmers often obtain access to equipment through unofficial arrangements with equipment operators in these farms. With cotton prices set low by the state, households tend to sell their inputs for cash, or use them on their own private plots.

Tajikistan

Also in Tajikistan, the government continues to be heavily involved in the cotton chain, although less transparently. Cotton gins are jointly owned by the government and the so-called "investors," financial institutions with (informal) links to the government. There is no competition between the gins. They operate as monopolists in clearly delineated areas, and prevent farms from delivering to other gins.

The vast majority of cotton is produced under VC finance package schemes, controlled by the "investors." They provide crop finance and sales contracts to the farms, and control also the processing of the cotton. Their finance comes through prefinance from the government and a single international cotton trader. The vast majority of Tajik cotton exports is controlled by one international cotton trader, Reinhart. This company negotiated a "financing package" in 1997 with the government of Tajikistan. Since then, the company, through a local bank (AIB), provides 77% of all agricultural credit, 90% of which is for cotton, of Tajikistan (ADB, 2002a). Reinhart/AIB provides loans to gins that use these loans to further provide finance to producers through the provision of physical deliveries of fuel, seed, and fertilizer.

This monopolized system leads to rent extraction from farmers with low seed cotton prices and inflated input prices (ADB, 2002b). With strict control of cash accounts held by producers and the lack of competition among gins, cotton producers have no alternatives. The situation is worsened by government involvement in farm production plans and farm debts. Producers have no choice in production decisions because they cannot get financing for the production of anything but cotton. Moreover, accumulated debts on their imposed cotton production leave them no choice then to follow local authorities' (who guarantee the debts) production plans.

Kazakhstan

The situation is entirely different in Kazakhstan, where VC is also widespread in cotton production, but where both producers and processors have been freed from government control since a few years and where competition among gins has produced much better conditions for cotton farms.

Kazakhstan initially also took a slow approach to the privatization of farms and gins, and much has changed since 1998. Gins were fully privatized by 1998 and, since then, many new gins have been established. Most gins began purchasing or hiring seed cotton delivery points to transport seed cotton from places outside their immediate area. The resulting competition and reduced transport costs have benefited (small) farms.

Cotton producers are generally too small to attract commercial credits directly, as they lack sufficient collateral and present a high default risk. They are mainly financed by gins. Eighty-nine per cent of producer respondents said that they received financing from a ginner. Gins provide crop finance, as well as supplying inputs and some agricultural services (see Table 9).

TABLE 9. Gin Assistance to Cotton Farms in Kazakhstan, 2003

Kazakh cotton farms		
Assistance to suppliers (%)	Yes	No
Finance	89	11
Water	73	27
Seeds	65	35
Fertilizer	40	60
Fuel	20	80
Agrochemical inputs	4	96
Agroconsulting	4	96

Gins obtain funds for these financing operations from three sources—trader financing, facilities with domestic banks, and from their own cash reserves. Trader financing takes the form of forward sales of cotton, against which the gins receive a percentage of the value of the cotton that is due to be delivered under the contract. Ginners and traders have established good trading relations through this system over the past 10 years.

Kyrgyzstan

The situation in Kyrgyzstan is more complex. Privatization, removal of government control, and competition seems to have induced a rapid expansion of the Kyrgyz cotton sector, albeit from a very small base, with similar effects as in Kazakhstan for farms. However, a poor supporting infrastructure and contract breaches with international traders a few years ago have negatively affected the growth of the cotton chain and VC. That said, cotton production and processing continues to expand strongly, partly based on smuggled Uzbek cotton, induced by the large price gap for seed cotton between Uzbekistan and Kyrgyzstan. Many new gins have been constructed in recent years, often with investments by Russian and Turkish textile companies.

VC is not needed for the processing of smuggled Uzbek seed cotton which is bought on a cash basis. However, locally produced cotton is based on prefinance contracts by the gins. This system was functioning well until a few years ago as gins were themselves financed under prefinance contracts with international traders. However, ownership and management of several gins changed around 2000 as the cotton sector was a target of money laundering strategies, and contracts were breached and prefinance from international traders has largely ceased. This has strongly affected contracting with farms as gins themselves now have problems accessing funds to finance the contracts. As a result, ginners have to provide financing out of their own cash reserves and this hampers their ability to finance large amounts of seed cotton. Privatized ginners supply finance under seed cotton “forward” contracts, with the producer contracting to deliver a predefined quantity of seed cotton to the gin and the ginner agreeing to supply the producer with local currency and inputs at certain times of the season to cover the cost of inputs and labor.

Grains

VC in the grain sector has taken a somewhat different road as that in the other sectors discussed so far. In fact, several forms of VC have emerged in the grain sector, both public and private. Public interventions have played an important role, and in different ways:

- First, in several East European countries, warehouse receipt systems (WRS) have been introduced, e.g., in Slovakia and Bulgaria, to help farmers overcome working capital shortages.
- Second, quasi-WRS have developed in Russia and are widely used to collateralize inventories (e.g., of grains and oilseeds). However, there are limitations on this system due to the absence of strong regulatory and enforcement systems or independent inspectors (see Annex 2).
- Third, authorities in three large grain-producing countries (Russia, Ukraine, and Kazakhstan) have actively intervened in the grain chain. In all three countries, authorities used their control over input supply channels (in particular seeds) to influence farms' grain production and marketing decisions. In all countries, this had a detrimental impact on the development of private input supply industries (see OECD, 2004 for Ukraine; Csaki et al., 2002 for Russia; and Gray 2000 for Kazakhstan).

More recently, strong vertical integration took place in Russia and Kazakhstan in grain production. In both countries VC was strongly affected by economic events in 1998. This induced the emergence of huge agroholdings in Russia. For example, huge vertically integrated holdings use 80% of the land in Belgorod region and 41% of all arable land in Orel region, two important grain-producing regions in Russia (see Annex 2 for details).

The changes in Kazakhstan were different.²² VC was already important in Kazakhstan, and driven by the private sector, before 1998. Until 1998, contract farming was the main organization form, with grain-trading companies entering into annual contracts to provide inputs against delivery of an agreed level or proportion of output of grain.

Three important events occurred in 1998, thoroughly affecting the structure of Kazakh agriculture. First, the strong devaluation increased the competitive position of Kazakh grain producers, while improved revenues with the increase in international energy prices contributed to more liquidity in the Kazakh economy. Second, the Government initiated effective bankruptcy proceedings to remove the burden of farm debts and to change ownership and management of farms. Third, a serious drought in the 1997–1998 season left many farms with increased debts and, importantly, hurt many grain traders who had contracted with grain farms and refinanced some inputs and were unable to recover their

22. Based on Gray (2000).

costs. In combination, these factors induced major changes in the supply chains and, in particular, the growth of large-scale corporate farming in the northern wheat-growing region.

While some grain companies continued contracting farms despite poor results during the 1998 drought, several companies acquired farms. Within the northern oblasts, grain and food companies bought several entire former state and collective farms, resulting in huge farming companies that now produce a large share of grain output. These large integrated farm complexes are located in the most favorable areas with the best growing conditions. Even within the same oblast the drier areas are attracting no such investment and the situation of the remaining farms is desperate. For example, in Kostanai oblast no large investor has acquired any entity in the drier southern regions. These forces lead to the survival of only the best and most profitable areas. The remaining areas, which constitute a numerical majority of farms, lack working capital to operate and continue to be dependent on the local authorities to provide guarantees for delivery of fuel and seed inputs.

IMPACT

The impact of these contract innovations is difficult to quantify as several other factors affect output simultaneously and as company-level information is difficult to obtain. Still, the evidence we collected from a series of case studies suggests that successful private contract enforcement with vertical contracting has important positive effects, both direct and indirect.

On Supplies and Productivity

An important direct impact is on the output and productivity of the processing company that initiates vertical contracting and its suppliers. Supplying enterprises have experienced beneficial effects on output, productivity, and product quality through better access to inputs, timely payments, and improved productivity with new investments. Case studies indicate that the programs can lead to double-digit annual growth in output and productivity.

A case study of the Slovakian sugar sector shows (a) how contracting with timely payments and technical assistance had immediate effects on productivity and output, (b) how the introduction of financial assistance packages was the main engine behind the growth in the supplier base, (c) how the benefits spilled over to the entire sector as other companies started copying the contracts and farm assistance packages (Gow et al., 2000). Table 10 shows how Juhocukor, the largest sugar processor in

Slovakia, had a decline in sugar beet deliveries and contracted hectares between 20 and 30% before 1993. The company was taken over by foreign investors, restructured, and introduced new contracts and farm-assistance programs in 1993. After that, its output grew by an average of 33% annually and its contracts by 25% annually between 1993 and 1997. Average *yields* increased from 33 tons per hectare with 13% sugar content in 1993 to an estimated 45 tons per hectare with 16% sugar content for the 1997 season.²³ While output increased immediately after the introduction of input and technical assistance programs in 1993, there was little impact on the number of contracted hectares until 1995. In 1995, a finance assistance package for suppliers was introduced. After this package was launched, contracting grew very rapidly: by almost 50% annually between 1995 and 1997.

TABLE 10. Impacts of contract innovations by Juhocukor*

Indicator	1990–1993	1993–1997		
		Total	1993–1995	1995–1997
Sugar production	–8.8	33.4	30.1	36.7
sugar content	1.2	3.6	3.0	4.2
Contract hectares	–6.6	25.3	1.7	48.8

*Average annual changes, in %.

Source: Based on Gow et al. (2000).

Other studies confirm that relatively small changes in the industry's practices can already have a major impact at the farm level. For example, Leat and Van Berkum (2003) indicate that dairy farmers, willing to learn, can achieve better performance even when they have access to only modest farm assistance. Another example from Friesland dairy investments in Romania is illustrative. In 2001, the Friesland company bought a Romanian dairy, which utilized less than 50% of its capacity and had a bad reputation with respect to paying its farmers. Without changing anything but paying-in-time, Friesland succeeded in taking in 20–30% more milk within a time period of 3 months. If farmers are convinced that a processor is reliable in making its milk payments, producers are generally prepared to deliver (more of) their milk (Van Berkum, 2004).

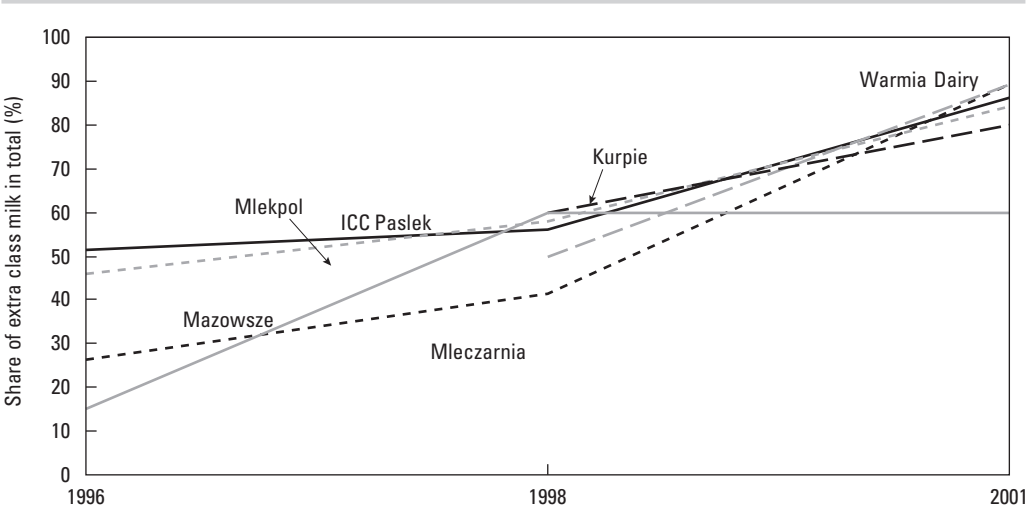
23. For comparison: EU average yields are 50–55 tons sugar beet per hectare and 17.5% sugar content.

In their survey of ECA agribusiness enterprise executives, White and Gorton (2004) concluded that various contract support measures had caused an average increase in yields of 9.6%. The measures with the greatest impact on yields were specialist storage (especially cooling equipment in the dairy sector), veterinary support, and physical inputs. Specialist storage in the form of on-farm cooling tanks has been particularly important in raising yields and quality in the dairy sector, an effect also found in other countries (Dries, 2004). Market measures such as prompt payments, guaranteed prices, and market access also had significant positive effects.

On Quality

Quality of output also improved due to these measures, as evidenced by increases in the percentage of output reaching higher or basic quality standards in response to specific programs. The programs with the greatest impact on quality were quality control support, veterinary support, physical inputs, market access, and prompt payment programs. Firms that saw an increase in product quality procured a significantly greater proportion of agricultural raw materials using contracts and also employed a significantly greater number of contract support measures.

FIGURE 4. Share of Extra Class Milk in Total Deliveries in Poland*

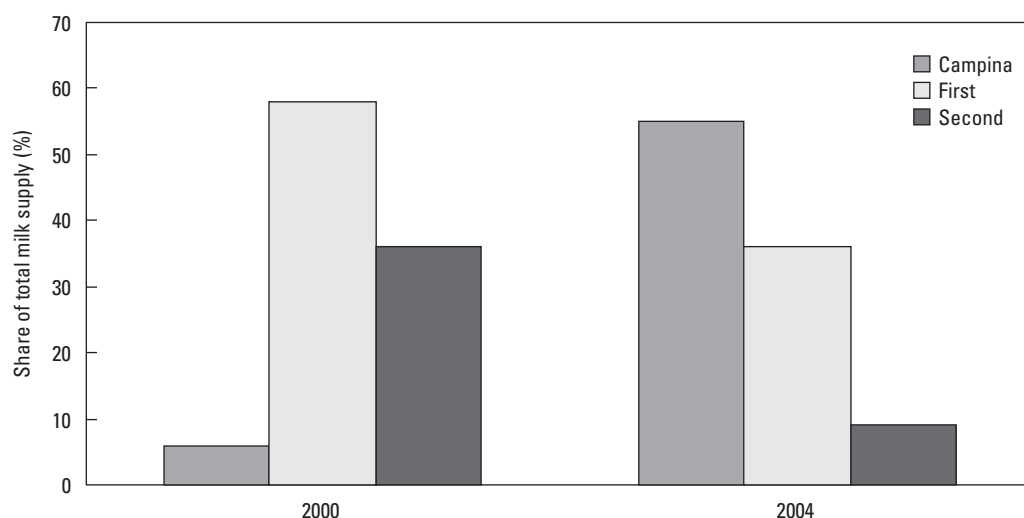


* Dairy companies in the North East of Poland.
Source: Dries & Swinnen, 2004.

Figures 4 and 5 show how milk quality rose rapidly following contract innovations by dairy processors were introduced in Poland in the mid-

1990s and in Russia in 2000. In Poland, the share of the market held by highest quality milk increased from less than 30% on average in 1996 to around 80% on average in 2001 (see Figure 4). In the Russian Campina factory, the share of the highest quality milk increased from 6% in 2000 to 55% in 2004, while the lowest quality fell from 37% to less than 10% over the same period (see Figure 5).

FIGURE 5. Quality standards of milk supplied to the Campina factory in Stupino, Russia, 2000–2004 (% of quality class in total milk supply)*



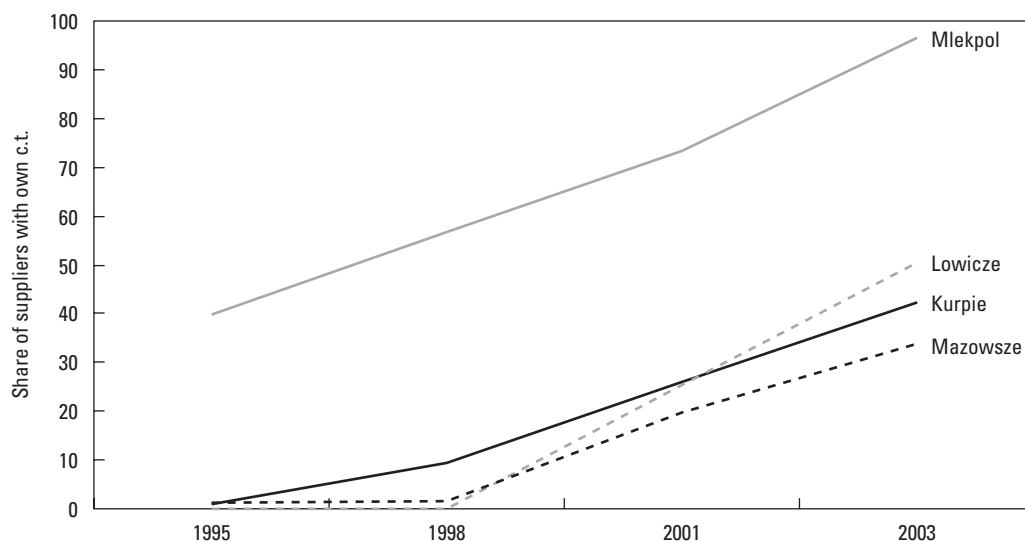
* The Campina quality class includes milk complying with Campina's international quality standards as well as Premium milk (the top quality class in the Russian classification system).

Source: EBRD/FAO (2004); Dries and Reardon (2004).

On Investment

Direct loans and loan guarantee programs contributed strongly to farm investments in small and medium dairy farms in North Poland (Dries and Swinnen, 2004). More than three-fourths (76%) of all farms made investments in the past years after VC was implemented, including many small farmers. Of those who invested, 58% used loans for investments in enlarging and upgrading the livestock herd (30%) and cooling tanks (56%). Also, programs that assist farms in accessing inputs (mainly feed) enhance investment indirectly by lowering input costs, or reducing transaction costs in accessing inputs, and consequently, through improved profitability. Figure 6 illustrates the strong impact on investment in equipment, in particular cooling tanks, for small dairy suppliers.

FIGURE 6. Growth in Dairy Farm Investments in Poland, 1995–2003
(% of suppliers with own cooling tanks for Northern Polish dairies)



Source: Dries (2004)

Cross-Company Spillovers

Indirect effects,²⁴ in particular cross-company spillovers, occur as firms competing for the same suppliers, and their fixed inputs, are forced to offer similar contractual arrangements.

For example, in the case of the Slovak sugar sector, competition induced other sugar processors, none of which were taken over by a foreign company until 1998, to imitate Juhocukor's contractual arrangements. With a 1 or 2 year delay, this resulted in increases in output and productivity in the other sugar companies and their suppliers. On aggregate, with spillover effects starting to be reflected in output after 1995, aggregate sugar output in Slovakia increased from 140,000 tons to around 250,000 tons between 1995 and 1998. Other studies confirm the importance of this competition

24. The literature on VC in developing countries identifies two additional sets of spillover effects. First, regional spillover effects may result as increased investments by farmers induce other input supply companies to invest in the region and to increase the quantity, quality, and variety of input supplies (Govereh and Jayne, 2003). A second effect is household-level spillovers. For example, Govereh and Tayne (2003) find important spillover benefits from vertical coordination in contracted cotton production on increased productivity of noncontracted activities resulting from management advice, and better input use in Zimbabwe. A study on contracted vegetable production in Uganda by Spencer Henson shows that benefits from VC for rural households come also from reduced risk (receiving guaranteed prices for contracted crops) in the absence of insurance markets, and improved access to credit (cash for contracted crops) in the presence of imperfect capital markets.

effect. Noev et al. (2004) and Dries et al. (2004) find that, respectively, in the case of the Bulgarian dairy sector and in contracting by modern retail companies in Croatia, competition for suppliers forces other companies to replicate farm-assistance programs in order to secure supplies.

Effects of Government Regulated Vertical Coordination

Not all examples of VC have equally impressive results. In particular, those cases where the government is heavily and actively involved in the creation and management of the vertically coordinated organizations the effects are dubious at best.

In the discussion of the cotton chains (see section “Sectoral analyses”), we already pointed out the negative effects of government intervention in the price setting and product planning and exchange for the farm incomes and efficiencies.

Also in Russia, the impacts of the government-led creation of huge agro-holdings are mixed (Gataulina et al., 2004; see Annex 2 for details). Vertical integration has contributed to a better supply of inputs to farms and growth in output and productivity, and also to poor financial results. Grain productivity has increased strongly since their creation in the late 1990s, also helped by strongly improved prices. Despite this, the profitability of grain, milk, and pork for these vertically integrated farms decreased over the same period. Moreover, in contrast to the cases of private-sector-driven VC discussed above, the vertically integrated farms in Russia performed consistently below the regional average. As a result, they have accumulated substantial debts since their creation. Hence, while the vertical integration process seems to have contributed to sometimes spectacular growth in output and yields, the profits of the vertically integrated farms seem to have been worse or not better than those of nonintegrated farms. A key problem is the authorities’ interference with production plans and with decisions relating to which activities (and companies) should be maintained by a holding, sometimes imposing unprofitable activities and companies on the holding.

THE SEARCH FOR QUALITY IS A KEY ENGINE OF VC

The shortage of quality supply, which is typical of transition countries, induces VC and spillover effects through farm support packages.

Quality demands and SPS standards are likely to increase both for exports and for domestic consumption. They will reinforce the tendency toward VC. On the *public* side, SPS regulations and other requirements will continue to increase for exports (Roberts, 2004). These will have spillover effects on quality requirements and standards for domestic consumption.

On the *private* side, modern processors and retail chains impose their private high standards even in countries where consumers may not demand such standards. There is extensive evidence on this for supermarkets (e.g., Dries et al., 2004). In a survey of foreign investors in the ECA food industry, all food companies identified quality as an important requirement for suppliers (see Table 11). There are several reasons for this. They use quality as a strategic tool and as an instrument to differentiate their products from competition. Another reason is that consistent quality standards reduce transaction costs in cross-border supply chains. Private standards also act as a substitute for missing public standards, infrastructure, and institutions.

The relationship between public and private standards is nuanced. Modern processors and retailers often have higher private standards than the existing public standards. However, in several cases the standards are also complementary. For example, in the Czech Republic, public standards require FFV producers to keep records of fertilizer and pesticide applications. The implementation of safety (residue analysis) and traceability measures are private initiatives (EBRD/FAO, 2005). Also, Van Berkum and Bijman (2004) find in their survey of food multinationals that these companies demand that their suppliers comply with both public- and company-specific quality standards (see Table 11). In order to reach the specific quality requirement levels, most of these companies have developed programs to assist farmers to improve their production methods.

There is an important issue of what the role of the public sector is in this process, and the issue is quite complex and nuanced. There is a bias toward private institutions in rich countries and toward public institutions in poor countries for standards and control (see Table 12). Yet, at the same time, public institutions in rich countries are typically better equipped and reliable to implement these controls. In many poorer countries, private companies are often the only organizations that have both the capacity and the incentives to enforce high product standards.

The issue of quality control has both efficiency and equity implications. In all the quality-induced VCs, farms get a higher price for higher quality. Since price is related to quality, control of quality is important. Often, quality controls are done by organizations that have an incentive to bias the assessments, both in private and public sectors. Table 11 indicates that quality control is always taking place at the factory gate, and sometimes also at the farm gate. Quality controls are implemented by the processors/retailers. The involvement of an independent third party to evaluate company control systems and production methods is still limited. Van Berkum and Bijman (2004) conclude that only in dairy in some ECA countries public inspection services play a substantial role.

TABLE 11. Quality Issues in Contracts Between Foreign Investors and Local Suppliers in the Agrifood industry

	Friesland	Campina	Oerlemans	SVZ	Farm Frites	McCain	Cehave
Explicit contractual agreement on quality	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Public versus company quality standards	Company specific	Company specific	Both	Both	Company	Company	Both
Quality control by	Company and third party	Company (each deliv.) and third party (3 monthly)	Company	Company	Company	Company	Company
Quality control point	At farm level, at collection point, and at factory gate	At farm level and at factory gate	At factory gate	At factory gate	At factory gate	At factory gate	At factory gate
Quality determined by	Processor and client	Processor and client	Client	Processor and client	Processor and client	Clients	Clients
Quality determined by product or by production process	Product	Product and production process	Both	Both	Both	Product	Both
Involvement of public inspection	Control at dairy level, not at farm level	Control at dairy and farm level	Very limited role	Only with disputes	Only in food safety issues	Only in food safety issues	Sets standards

Source: Van Berkum and Bijman (2004).

TABLE 12. Public versus Private Standards Institutions in 2000

Countries	Public sector	Private sector	Public-private
Industrialized countries	27%	52%	21%
Developing countries	88%	6%	6%
Total	73%	17%	10%

Source: Henson and Spencer (2004).

This causes problems when there is no transparency or trust. For example, prices for cotton seed for farmers in Kazakhstan and Uzbekistan are based on quality. In Kazakhstan, the quality control is done by the private ginneries in their labs. A World Bank survey of small cotton farmers in Kazakhstan found that only 8% of the farmers always trusted the evaluation by the ginneries; 60% of farmers say they do not always trust the evaluation, and 32% never trust the evaluations. In Uzbekistan, quality controls are implemented by a government-controlled agency. Yet producers also complain that they are unfairly treated and that their cotton deliveries are downgraded. Farms, anticipating this, mix good- and bad-quality seed cotton and attempt to pass it off as good-quality cotton. Improving the quality controls, e.g., by introducing an independent control institution, or by letting farm representatives participate in the evaluation would have both efficiency and equity benefits. Improving quality controls, e.g., by introducing independent control institutions, would therefore have both efficiency and equity benefits.

COMPETITION SPREADS EQUITY AND EFFICIENCY BENEFITS

Competition plays a very important role in supply-chain effects in inducing both beneficial equity and efficiency effects:

- First, *competition induces VC spillover effects across the sector* as other processors are forced to introduce similar supplier-assistance programs since suppliers may not want to deliver unless they get similar conditions. This finding of our study is a specific case of more general conclusions that competition is a key factor for encouraging innovation and productivity and that technological development is primarily encouraged through the presence of competition. These are key conclusions in the World Bank’s forthcoming World Development Report on *Improving the Investment Climate for Growth and Poverty Reduction*.

- Second, *competition prevents farmers from being “exploited.”* Competition prevents processing companies or input suppliers from exercising monopoly power in the setting of the contract conditions with farms.

A comparative analysis of VC in the cotton sector in Central Asia confirms the importance of competition as an important factor to protect small farms against rent extraction by large processors. The only places where we find clear evidence that farmers are consistently exploited are in government-controlled monopolized systems, such as the cotton system in Uzbekistan, Tajikistan (and Turkmenistan). In contrast, in Kazakhstan, the cotton chain is characterized by strong competition among private gins buying cotton seeds from small farms for processing. Competition among gins for supplies has induced several developments in Kazakhstan:

- *Ability of small suppliers to get better conditions by changing gins.* Almost all (92%) of the interviewed farmers said that they had changed ginnery over the past years if they got better prices or conditions, indicating independence and competition. All farmers (97%) said that they would be able to change gins if they wanted to.²⁵
- *Investment by gins in local cotton seed collection centers.* This means that a farmer now has the option of delivering his seed cotton locally, to a ginner who is not from that area. The cost of the transportation of the seed cotton now falls on the ginner. The provision of basic inputs to small farmers on reasonable conditions.
- *Better prices:* as Table 9 illustrates, prices for Kazakh cotton farmers are *two to three times* higher than those in Uzbekistan or Tajikistan, where competition does not exist.

While there remain important problems in the Kazakh cotton system, compared to the situation in Uzbekistan and Tajikistan, the Kazakh situation seems to be considerably more favorable in terms of both equity and efficiency.

FOREIGN DIRECT INVESTMENT IS ENGINE OF CHANGE

An important issue is the role of foreign investment, both as an engine of change and as a potential source of exclusion.

25. There appear to be regular contract break-ups by farmers during the season when another gin offers a higher price. There is a system that if you get prefinance and inputs from one gin that you can repay the prefinance and the inputs to the gin, plus a penalty for nondelivery, and then deliver your cotton seeds to another gin.

The first issue is whether FDI is the engine of VC in supply chains. Conceptually there is no need for FDI to implement successful contracting and supplier-assistance programs. However, empirically we observe that FDI has been the most important driving factor behind these programs. Foreign investment plays an important role as an initiator of change and institutional innovation.

The introduction of basic forms of vertical integration requires access to outside financial sources, which foreign investors have, but which other investors also can have. However, more sophisticated forms of vertical integration, with a greater emphasis on quality and standards, are often introduced by foreign companies because they tend to pay greater attention to quality standards.

But we also find that spillover effects lead to convergence. For example, in the Polish dairy sector, in the mid-1990s, there was a significant difference between foreign-owned processors and local processors. However, by 2001 this gap had disappeared largely as domestic companies started copying the management practices of foreign affiliates.

The second issue is whether foreign investors are more likely to exclude small suppliers from the supply base. Foreign agribusiness companies in interviews expressed a preference to source their supplies from larger suppliers (Van Berkum, 2004). However, many domestic companies have similar preferences. Empirical evidence based on surveys does not find that foreign-owned companies are more likely to cut off small farmers from their supply base than domestic companies. In fact, our surveys in Poland and CIS indicate that FDI firms source at least as much from small farms as domestic companies. FDI can play an important positive role in the survival and growth of small farms directly and indirectly, by initializing farm-assistance programs and institutional innovations and providing an example of how such innovations can work.

What seems to be a key difference in small farm inclusion is the ownership structure of the companies. Cooperatives are more likely to work with small farms than corporate companies, either domestic or foreign. Our studies from the Polish and Romanian dairy sector indicate this.

TRADE PROTECTION AND VERTICAL COORDINATION

The argument made is that (some) protection simulates VC. Obviously, there is a relationship between investment and protection—either because of the direct effects of trade policy, or indirectly because it stimulates FDI. The first is trivial, and the second is widely analyzed, as part of many studies on the FDI-trade relationship. Hence, the key issue here is *whether protection stimulates VC beyond these well-known effects.*

The answer is not clear. The only cases where trade protection would seem to stimulate VC with domestic suppliers is where the initiators of VC are processors who use as input supplies not the basic commodity, but an intermediate (processed) product that is easily tradable, such as skimmed milk powder for secondary dairy processing or malt for breweries. However, a considerable share of VC in ECA is with suppliers of bulky, perishable products (milk, sugar beet, vegetables and fruits, etc.), where it is not evident to source supplies internationally. For example, the CEO of a large retail chain in the Balkans explained that, “for everything which can be made from milk powder we use highly subsidized milk powder from the EU, but for the rest we continue to contract with thousands of small local dairy farms,” where contracting involved in importing heifers, giving loans to dairy farms, etc.

Another case is cotton in Central Asia. Some gins in the Kyrgyz Republic do not provide VC because they use imported cotton seeds, but this is only smuggled cotton seeds from Uzbekistan. However, as soon as Uzbekistan would liberalize its trade and cotton policy, this would (a) reduce smuggling because domestic supplier prices would double in Uzbekistan and (b) induce significant investments in the Uzbek cotton gins, most likely with VC. Hence, liberalization would *increase* VC on both sides of the border.

Even in cases where products can be sourced internationally, it is not clear that trade protection would lead to more VC or less. Consider supermarkets and F&V supplies. Generally, the arrival of supermarkets and their development of preferred supplier lists, with cross-border sourcing, initially tend to increase VC with local suppliers, and later with investment in logistics to increase cross-border sourcing. This process causes at least as much international sourcing than it reduces. Here again the impact of protection on VC is much less clear than suggested.

Finally, open trade can play an important role in providing competition in supply chains. For example, in Moldova the main oilseed crushing company wants to ensure its monopoly on sourcing from farmers through export restrictions on oilseeds. An open trade regime would provide farms with alternative outlets, improving their situation—similar to cotton trade in Central Asia where government export restrictions hurt farmers.

PROBLEMS OF EQUITY AND EXCLUSION

There are two potential equity problems with the VC process. The first is the possibility of rent extraction by the dominant company in the chain. The second is exclusion from the VC process.

Rent Extraction

By introducing an interlinked contract, farms can access credit, inputs, etc., which was unavailable before and processing companies can have access to higher quality and timely supplies. Productivity and income increase for the chain as a whole. However, a key question is who benefits from this increase in efficiency and total income? If both the supplier and the processor benefit from the institutional innovation, everybody is better off.

However, the very rationale for the emergence of these VC institutions may at the same time act as a barrier to entry for other companies and may give the dominant partner in a transaction additional leverage. If the processing firm can set the terms of the contract such that it captures most or all of the rents, the productivity growth may not benefit the farms. Moreover, if the interlinking of transactions bestows additional monopoly power upon the processing company, the farm's income could even be lower after the contract innovations, despite the fact that total income has improved.²⁶

Hence, an important—and outstanding—issue is how to combine efficiency gains with an equitable distribution of the benefits in the chain. As we have explained in a previous section, competition can play an important role in this process. Competition prevents companies from exercising monopoly power in the design of the contract conditions and makes it more likely that the farms share in the benefits.

Interestingly, there may be, at least initially, a problem of sustainability of the new contracts in a competitive environment. For example, with prefinanced feed by dairy companies, or seed and fertilizer by crop processing companies, farms sold their output to competing processors who could offer higher prices since they did not have to incorporate the costs of the assistance programs. In other words, while competition is important to induce a desirable distribution of the gains, competition may undermine the ability to obtain the gains.

Empirical evidence on these issues is limited and one should be careful drawing conclusions. Preliminary evidence suggests that so far in ECA (a) both farms and processors benefit from private-sector-induced VC, especially when sufficient competition is present, (b) that competition can cause enforcement problems, complicating the VC, and (c) that rent extraction seems most problematic where governments are directly or indirectly involved in restricting competition, as, e.g., in some Central Asian cotton chains (see section "Sectoral analyses").

26. See Bardhan (1989) and Bell (1989) for an analysis of these equity effects in developing countries in the framework of landlord-tenant transactions.

The Problem of Exclusion: Small Farmers in the Chain

A key concern is that the process of VC will exclude a large share of farmers, and in particular small farmers. There are three important reasons 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 or supply to the company, 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.

Our studies and interviews with companies generally confirm the main hypotheses coming out of global observations (see Annex 3 for more details):

- Transaction costs and investment constraints are a serious consideration.
- Companies express a preference for working with relatively fewer, larger, and modern suppliers.
- But empirical observations show a very mixed picture of actual contracting, with much more small farms being contracted than predicted based on the arguments above.

Empirical Evidence

Empirical evidence from transition countries and from emerging and developing countries shows a largely consistent picture. Our studies and interviews with companies generally confirm the main hypotheses that transaction costs and investment constraints are a serious consideration and that companies express a *preference* for working with relatively fewer, larger, and modern suppliers. However, our empirical observations also show a very mixed picture of *actual* contracting, with much more small farms being contracted than predicted based on the arguments above.

In fact, our surveys in Poland, Romania, and the CIS find no evidence that small farmers have been excluded over the past 6 years in developing supply chains. In the CIS, the vast majority of companies have the same or smaller suppliers in 2003 than in 1997. In terms of the supplier assistance, better and more assistance seems to go to larger farms, although there is significant variation with the type of assistance.

Other studies confirm that VC does not exclude small farmers from the supply chains and that all major companies contract with small farmers, but that more sophisticated supplier-assistance programs tend to be more available for larger farms. Often, supplier programs 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.

Hence, despite the apparent disadvantages noted earlier, the empirical evidence suggests that VC with small farmers is widespread. Furthermore, our empirical evidence indicates that companies in reality work with surprisingly large numbers of suppliers and of surprisingly small size.

Why Contracting with Small Farmers?

There are several reasons:

- First, the most straightforward reason is that companies have no choice. In some cases, small farmers represent the vast majority of the potential supply base. This is, for example, the case in the dairy sector in Poland and Romania, and in many other sectors in ECA.
- Second, our case studies suggest also that company preferences for contracting with large farms are not as obvious as one may think. While processors may prefer to deal with large farms because of lower transaction costs in, e.g., collection and administration, contract enforcement may be more problematic, and hence costly, with larger farms. Processors repeatedly emphasized that farms' "willingness to learn, take on board advice, and a professional attitude were more important than size in establishing fruitful farm-processor relationships."
- Third, in some cases small farms may have substantive cost advantages. This is particularly the case in labor-intensive, high-maintenance, production activities with relatively small economies of scale.²⁷
- Fourth, processors may prefer a mix of suppliers in order not to become too dependent on a few large suppliers.
- Finally, processing companies also differ in their willingness to work with small farms. Some processing companies continue to work with small local suppliers even when others do not. These companies have been able to design and enforce contracts which both the small firms and the companies find beneficial. This suggests that small-scale farmers may have future perspectives when effectively organised.

27. For example, Key and Runsten (1999) present evidence that small farmers' production costs in Mexican vegetable contract production were 45% lower than that of specialized farms owned by the processing companies. Small farmers had significantly lower labor costs because of access to unremunerated family labor for which markets are missing, and much lower costs of supervising, transporting, and recruiting labor input; and because they did not pay any government benefits. And also pest control costs were lower due to better crop monitoring and thereby lower chemical use. Further, small farmers yields in vegetable production were 20% higher than on the firm's own farms.

The Farm-Assistance Paradox

The evidence presented so far suggests an interesting paradox. Small farmers in ECA may not be able to make the necessary upgrades to satisfy the demand of modern supply chains without support packages by processors or agribusiness. If there are sufficient (quality) supplies available for processors, they have no interest in introducing such VC support packages. If there are not sufficient supplies, VC will be forthcoming. Hence, we have the paradoxical situation that small poor farms may be best off (in the perspective of “supply-chain-driven development”) if they are in an environment which is dominated by small financially constrained farms.

There is some empirical evidence for this hypothesis. Companies seem to be most likely to reach out to small farms when they face a supplier base that is dominated by small farmers not able to supply the commodities they want, and least likely when there is a heterogeneous farm structure with some farms able to deliver the desired supplies. For example, some international dairy companies and foreign investors target larger farms as their preferred suppliers and only reach out to smaller suppliers if they need them to secure supplies. For example, in the case of dairy processors, the same processors have different minimum size thresholds for different countries, reflecting the structure of the farm sector in these countries. An international comparison suggests that in Hungary, with many medium and large farms, suppliers have to have more than 20 cows; in Poland, with many small farms, more than five cows, and in Romania, where almost the entire herd is in semisubsistence farms, processors work with farms with two cows.

ECA is a “Supplier Market”

The collapse of farm output and livestock numbers created a gap between processing capacity and supply: hence there is excess demand based on processing capacity. There is even more excess demand for high-/better-quality supplies because quality is low due to (a) a history of poor quality in the system and (b) reduced access to inputs and finance affect the quality as well.

This makes it a “suppliers market” in most of ECA and this, in turn, supports the farms’ bargaining position vis-à-vis the processing sector in the distribution of supply chain rents.²⁸ Moreover, in cases where quality supplies

28. Codron et al. (2004) argue that also in Morocco and Turkey, where there is also a shortage of preferred suppliers to retail chains, these suppliers have strong bargaining power (“most of them have more bargaining power than the retailer”) because, first, as modern retailing of FFV is still in its infancy, there are only a few modern and large grower-shippers, and, second, with a high price gap between exported produce and local produce, the cost of contract termination for the suppliers is small since they can get the high export price for their high-quality products.

are scarce and nontrivial investment is required for quality upgrading, the bargaining power of quality suppliers may increase substantially (post-investment) vis-à-vis the processor or trader.²⁹

These arguments are important both for the issue of exclusion and for the rent distribution in the chain because it suggests that the “power relationship” (and the rent distribution) is endogenous in the development of the supply chain integration.

For Now . . . No Time for Complacency

What will happen when the market turns? If competition among suppliers increases, or if demand falls, pressure on processors may lead to a consolidation of the supplier base. At this point there is no systematic evidence that this is happening in ECA. However, there is some ad hoc information from the most advanced countries which suggest that this may be the next phase of VC. Studies from other parts of the world, in particular emerging markets in Latin America, suggest that these pressures may be real and important (Reardon and Berdegúé, 2002; Berdegúé et al., 2003).

Moreover, we find that even companies willing to invest in upgrading small farms only go so far, and tend to have a strategy in the long run to upgrade part of their supply to larger, more efficient, and fewer suppliers. In many cases supplier-assistance programs explicitly discriminate between larger and smaller farms with the focus of upgrading the better farms and ensuring a minimal supply base and quality from the rest as long as it is required.

Hence, in combination, these factors indicate that those who are concerned about the inclusion of small farms in these supply chains *should not be complacent* despite the observations of significant contracting with small suppliers taking place right now.

Putting the Equity Issues into Perspective

Clearly the equity issues are important challenges. However, several factors suggest that the impact of VC in ECA supply chains will be nuanced, also for small farms. First, the impact of VC is likely to differ significantly between countries and sectors. In some ECA countries, farm output is mostly produced by larger corporate farms. For example, in Slovakia and the Czech Republic, the vast majority of output is produced by corporate farms. In other countries, the importance of farm organizations often

29. Studies on international FFV supply chains in East Africa also find that with increasing demand for traceability, the “dependency relationship” between suppliers and processors changes; as processors/traders are now more dependent on their suppliers. By working with fewer suppliers, but with higher quality and traceability contracts, the suppliers become more “powerful”—and tend to get higher prices.

differs significantly among subsectors (e.g., grains versus vegetables), reflecting economies of scale.

Second, the impact of VC is likely to be a continuation of important agri-food chain restructuring that started 15 years ago. ECA farms have undergone a dramatic restructuring over the past 15 years. Besides privatization, this included a massive outflow of labor in the most advanced ECA countries. In countries such as Estonia, Hungary, the Czech Republic, and Slovakia, more than 50% of (officially registered) workers left agriculture early on in transition.³⁰ This process continued as investments in the food industry and the need to enhance the international competitiveness of the domestic farms have continued pressure for restructuring. In other countries, this adjustment process has been delayed by a variety of problems, but a significant reduction in agricultural employment will be necessary with economic growth, with or without VC.

Third, the VC processes have positive effects by addressing major weaknesses of the ECA farm sector. The ECA farm sector is most in need of finance for investments, technology, and quality improvements, and access to high-value markets. All these factors weaken the competitiveness of ECA food-supply chains with negative effects on their trade balances. Investments by modern processing companies and VC with suppliers can play a significant role in addressing these weaknesses and improving the global competitiveness of the ECA supply chains.

Fourth, modern agribusiness and food company investments will not only affect farms, but will have a wider impact on rural development. This includes improved access to better quality and a wider variety of foods and other products for rural households, and the creation of off-farm employment, directly or indirectly, in the supply chain. Investments in packaging, quality control, extension services, etc., are likely to create new jobs in the rural areas; while at the same time the competition from the new chains will cause traditional shops and processors to close. Modern agribusiness and food companies, as motors of market development, will also generate opportunities for differentiation of products and value added.

In summary, these arguments suggest that VC in modern supply chains have the potential for important positive implications for rural households in ECA, despite the challenges that they pose. These investments may bring very significant benefits to the region, but could also pose significant threats where inefficient or undercapitalized farmers cannot “make the grade.” It is important for policy to focus on the most effective and

30. The average annual decline in agricultural employment in the first wave countries Hungary, Czech Republic, and Poland was -12% in 1989–1992, -6% in 1993–1997, and -4% in 1998–2001 (Swinnen et al., 2005).

appropriate methods for developing “win-win” solutions for companies and farmers.

PRIVATE VS. PUBLIC: IMAGE AND REALITY

Small Farm Assistance

The public policy debate (explicitly or implicitly) often frames the issue of vertical integration and small farms in terms of how public policy can assist small farms who are excluded by the private sector from their supply base. However, the reality suggests a much more nuanced picture. In fact, in a number of cases, instead of excluding small farms, their supplier-assistance schemes seem to reach many small farms that are left out of government programs. For example, our study on the Lithuanian dairy sector shows that small farms do not get access to government programs such as SAPARD. For them, the only source of credit and finance is supplier credit.

Furthermore, public policies may even worsen the situation for small farms. Private processing and trading companies only implement their assistance policies out of necessity to enhance their supply base, and seem to do so with some but relatively little discrimination toward small farms. However, if government policies allow medium and large farms to upgrade their technology and farm infrastructure directly or to get access to formal bank loans, they may induce processors to drop their general supplier-assistance packages and start working with the medium and larger suppliers with minimal assistance only. In this way, some government rural credit and investment policies may have both direct and indirect anti-small farm biases.

Farm Exploitation

The public policy debate (explicitly or implicitly) frames the issue of vertical integration and small farms in terms of how public policy can prevent (small) farms from being exploited by large, sometimes multinational, agribusinesses in their contractual relationships. However, again, the reality suggests a much more nuanced picture.

First, while for all agribusinesses profits are their primary concern, this does not seem to lead to exploitation of farms. In cases where sufficient competition exists there is more evidence that suggests that producers benefit from VC than that suggests they are being exploited.

Second, and equally important, the main cases of farm exploitations that we found is those cases where governments had a heavy hand involvement in either the control of input supplies and product processing/marketing themselves or where the authorities colluded with a single private company, allowing and preying on the rent extraction of farms

by the private company. This is the case in the cotton sectors of Tajikistan and Uzbekistan.³¹

Third, evidence from Ukraine, Russia, and Kazakhstan indicates that an important constraint on enterprise development is rent-extraction by local governments, e.g., through taxation and ad hoc regulations. A major benefit of large (often vertically integrated) farming corporations in these countries is their ability to withstand pressures from local authorities. This leads to a paradoxical situation that instead of public policy assisting small farms to grow in a market environment dominated by large companies, farms need to be large to withstand public pressures.

THE FUTURE OF VERTICAL COORDINATION

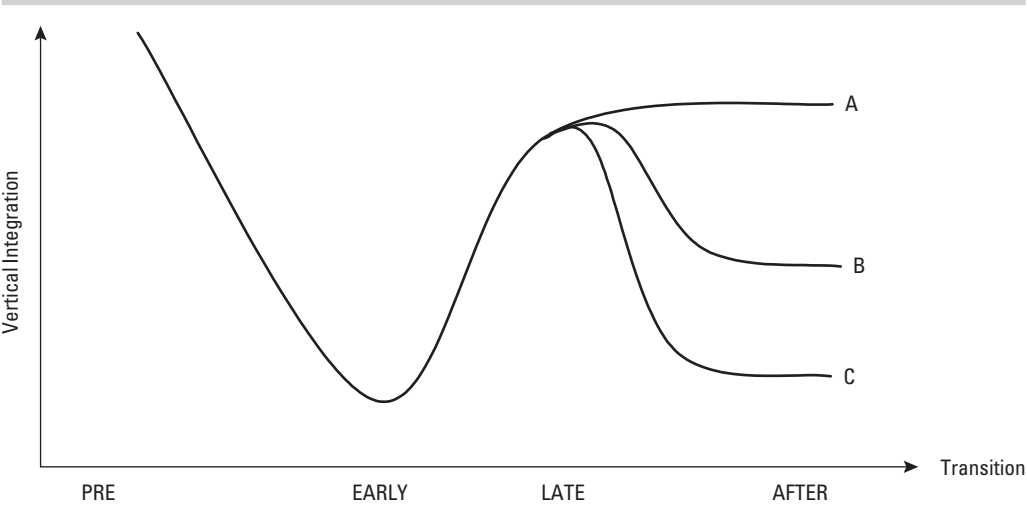
The underlying reason for VC is that these institutional designs address (transition-specific) problems that traditional financial instruments do not address. This holds also for farm-assistance programs, leasing, WRS, prefinancing in vertical contracts, etc. Hence, when markets start working better, there is less need for VC.

An intriguing question is therefore whether the process as described here represents a transition-specific phenomenon or not. The transition from a centrally planned system to a market economy in most of the countries coincided with the break-up of the old state system of strong vertical integration into independent units as illustrated in Figure 7. However, the transition disruptions of the exchanges in product and factor markets caused independent private companies to take initiatives to vertically integrate to enforce contracts and improve coordination within the supply chain. In other words, will vertical integration in the supply chain be reinforced (path A), or will it retreat once public institutions are sufficiently strong to enforce contracts, with the development of new public institutions and market actors, and once factor markets work better (path C)?

Most likely a hybrid path will develop in the medium term (path B): for some aspects, vertical integration will remain important. Some forms of VC will remain important, as they are in developed market economies (described earlier). However, in other aspects, which are more closely aligned with transition conditions, VC may retreat. For example, recent information suggests that some of the multinational companies, where possible, return to their core business and leave farming to farms, with as little involvement of the company as possible to keep the quality and reliability of supplies up to a desirable level.

31. Interestingly, the IFAD (2003) also finds that the main case of rent extraction in the East African farm contracting chains is in Mozambique where government-controlled monopolies dominate.

FIGURE 7. Vertical Integration in the Agrifood Chain During Transition



In general, processing companies have vertically integrated out of necessity rather than intrinsic interest. These companies want to get out of VC if they can, because it is not their core business and because they do not want to carry the risk. These companies prefer no longer to be involved in several aspects of this VC. They would prefer working with “normal” partners—such as financial institutions for farm lending. The change of company VC strategies at various stages of transition is illustrated by the case of Farm Frites, one of the largest potato processors in Europe, which started investing in Poland in 1992: “In the early years of its presence in Poland, Farm Frites found too few Polish farms had the knowledge and means to supply Farm Frites with good quality potatoes. Therefore, the company leased land and cultivated potatoes by itself to supply the factory with good quality potatoes. Next, Farm Frites contracted mainly foreign potato growers already settled in Poland, which were used to West-European quality standards. Step by step Farm Frites has been able to increase the local supply by Polish farmers by assisting them in improving their performances both in yields and the quality of their produce. Nowadays, the company has reduced most of its own potato growing activities, while Polish farmers supply almost 50% of the company’s total purchase of potatoes” (Van Berkum and Bijman, 2004, p. 11).

IMPLICATIONS FOR GOVERNMENT POLICY AND WORLD BANK OPERATIONS

This report has touched upon a wide variety of issues where policy plays an important role. The issues include the role of privatization, investment

policy, macroeconomic reforms, land reform and farm restructuring, capital market liberalization, competition policy, etc. It would go too far here to address all these issues and the policy implications related to each of them. This section concentrates on a series of key messages and implications that come directly out of our report and are most relevant.³²

A government strategy to stimulate domestic growth in a supply-chain-driven development process while ensuring the inclusion of farms which face major constraints in this process, and an equitable distribution of rents in the chain, should include several policy components, encompassing changes in the regulatory environment and public investments. The policy issues and components can be classified, roughly, in to three groups—although some of the policies could fit in more than one of these groups: (a) the enabling environment for the emergence of VC, (b) policy and programs for addressing equity and efficiency concerns of VC, and (c) implications of VC for public interventions and role in agriculture and agribusiness development.

Before discussing these in detail, it is important to emphasize more *general policy issues*, which are arguably the most important policy implications of this study. The first is the importance of the VC phenomena in ECA agrifood chains and, therefore, the need to explicitly integrate these developments into the policy thinking and program strategies. One of the key findings of this study is that VC is much more important and more widespread than generally recognized. Policies, in general, have not integrated this structural development so far. The second is that there is significant variation across countries and sectors. The implication is that, as there is no one-size-fits-all VC but instead several models of VC, reflecting commodity characteristics, 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.

In this perspective, *the focus of the discussion of policy implications in this report is primarily on less advanced ECA countries*, where the WB will be primarily active in the coming years.

Enabling and Stimulating Vertical Coordination

Create right conditions for stimulating investment

Two general conclusions made in the World Bank's forthcoming World Development Report on *Improving the Investment Climate for Growth and*

32. Several of these issues and the policy implications are also discussed in related World Bank studies and reports, such as the 2004 *Agricultural Investment Sourcebook*, "Challenges, strategies and cost of compliance in agrifood standards" by Jaffee et al. (2004); "The Use of Grants to Address Market Failures" by Van der Meer and Noordam (2004); and the 2005 World Development Report on "Improving the Investment Climate for Growth and Poverty Reduction."

Poverty Reduction are that a good investment climate is the driving force behind economic growth and poverty reduction, and that policy uncertainty is the primary concern of firms in developing countries.

In our study, we found ample evidence that a poor policy environment has a negative effect on investments in the agrifood industry and on VC programs. As such it constrains the beneficial effects of VC, which have been shown to be important. For example, the CIS supply-chain study identified problems related to “market governance” as the most important constraints cited by processors. They identify two such problems in particular: the continued operation of “shadow” producers who undercut their competitors through smuggling, counterfeiting, and the avoidance of tax and social security obligations and corrupt national administrations that impose burdensome regulations and demand frequent bribes.

Ensure macroeconomic stability

Macroeconomic stability is a key condition not only for the investments but, even more so, for supplier-assistance programs or other forms of chain-based finance. Since VC is importantly a financial activity, significant instability may cause such changes in the contract conditions that self-enforcement is no longer possible. This was the case, for example, with the development of quasi-WRS in Russia during the 1998 crisis, or input pre-finance programs in Kazakhstan during the same period. Hence, macroeconomic stability is not only necessary for more traditional financing systems but also for nontraditional financial instruments.

Refrain from direct intervention: Bad policies are worse than bad weather

Direct government intervention in the supply chains may undermine the emergence of nontraditional VC finance systems in several ways; for example, direct interventions in the commodity or input supply markets may crowd out alternative financing systems or cause defaults.

Large-scale defaults in VC have been caused by both bad weather and bad policies, as they lead to contract enforcement failures. While both can lead to contract breaches, one may be worse than the other in the long run by undermining the private sector development of input provision, both with and without VC.

Governments continued to play a very heavy-handed role in the allocation of fertilizer and seeds in several countries. For example, in Ukraine, government intervention in input supplies in the 1990s caused private input supply contracting to stop. All private companies moved to input supplies and output purchasing on a cash basis. Private input supplies to the sector declined by about 80%.

Large-scale defaults due to weather effects induced adjustments of contract systems and temporary disruptions, but the long run effects were much less negative. Farms defaulted on their repayments after bad harvests due to poor weather. While processors suffered significantly, they were willing to re-engage in VC, with some contract adjustments to reflect risk-reducing strategies. This suggests that processors and input suppliers are willing to incorporate temporary defaults due to unforeseen shocks such as the weather but not systemic risks due to government interventions.

Improving Efficiency and Equity in VC

Reduce transaction costs

The disadvantage of small suppliers is mostly due to transaction costs.³³ Therefore, focus on reducing transaction costs, i.e., the costs per transaction. This can be done in several ways:

- *Lower transport costs through improvements of rural infrastructure.* Rural infrastructure is identified as a serious constraint on VC, and particular on integrating smaller producers in more remote areas. For example, bad roads make it difficult to collect farm produce in several countries; regular electricity interruptions in Azerbaijan constrain investments in processing or storage facilities which require electricity, e.g., cooling equipment. Public investments in such infrastructure would stimulate (a) agribusiness investment, (b) VC with suppliers, and (c) inclusion of small farmers in these regions.
- *Reduce the number of transactions by investing in intermediary institutions.* Intermediary institutions reduce the cost of exchange between farm and processor/input supplier. Investments in this include both the creation of *farm associations* and investment in *collection points*. Collection centers are used by processors and retailers to source from many small suppliers many small farmers, such as Poland, Bulgaria, and Romania, and in Latin America.³⁴

33. Another factor is scale economies. There is a large literature on scale economies in agriculture. Scale economies are commodity specific (e.g., wheat vs. dairy), but in general they are rather limited in agriculture, and can often be captured by (larger) family farms. In combination with significant transaction costs in monitoring labor, that is one of the reasons why the family farm is a dominating farming organization in much of western market economies.

34. In some cases we found that retail companies and processors asked farms to organize themselves into associations (see, for example, in Annex 2 the case of the PMOs in the Czech F&V sector for supplying to supermarkets). This suggests that for processors and retailers reducing transaction costs is more important than increased bargaining power of suppliers with farm associations.

- *Investment in farmers associations* has several advantages, such as reducing transaction costs, enhancing suppliers bargaining position vis-à-vis suppliers and vis-à-vis governments, and as an instrument for communication and information distribution. Stimulating farmer associations is an often mentioned policy. In fact, it is hard to find a policy document that does not mention it as an important policy. However, the formation of associations in transition countries is hampered by farmers' negative communist experience with imposed collectivization and farm cooperation.³⁵ Therefore, innovative approaches are important here.

Enforce competition

The report has documented the great importance of competition in the supply chain, both for efficiency and equity. Competition induces processors, retailers, and input suppliers to provide more supplier-assistance programs and it constrains rent extraction of suppliers by up- or downstream companies. Given these strong benefits of competition for farms in the chain, ensuring competition is an important role for the government. Competition should 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.

Competition is also important on the input side. The existence of alternative channels of credit or inputs will constrain rent extraction in the supply chains. Therefore, investments in alternative sources of farm finance, such as cooperative credit associations, microcredit institutions, etc., should be supported and continued.

Stimulate and certify quality and safety standards

Invest in projects, institutions, and technical assistance stimulating higher quality
Modern supply chains are based on quality, both domestically and internationally. Therefore, preparing suppliers for quality-driven markets will make it easier for them to be integrated in the chains. Technical assistance to strengthen public sector quality testing and certification schemes are useful, both for participating in domestic chains and international trade.

35. This is not only the case in transition countries. Key and Runsten (1999) also document how farmers in Mexico are reluctant to work cooperatively because many collective and cooperative rural organizations, including the ejido system, have a history of being used for political ends and subject to manipulation by corrupt leaders.

Furthermore, with prices positively related to quality, it will increase incentives for quality production and, ultimately, incomes.

This can also include systems for accreditation and certification, promoting better farm and postharvest practices, developing better record-keeping/traceability systems.

Enhance bargaining power of (small) farmers

Empowering farmers is needed to strengthen their position in the chain and vis-à-vis governments in bargaining for better contract deals, better policies, etc. Several of the policies mentioned earlier will contribute to this objective, such as (among others):

- Stimulating farmers associations
- Investing in quality control institutions
- Competition policies

Invest in institutions to assist farms with contract negotiations and dispute settlements. Measures to increase the transparency of contracts, provide for 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 contracting system, competition among contracts, and thereby the bargaining position of farms. As it is generally either not possible or too costly to resolve disputes in courts, alternative dispute settlement institutions can play an important role.

Invest in institutions for (independent) quality and safety control and certification. Investing in quality control centers has additional advantages of enhancing the bargaining power of suppliers and ensuring correct payments for quality in the chain. This will lead to better investment incentives and more equal distribution of rents. Improving quality controls, e.g., by introducing an independent control institution, or by letting farm representatives participate in the evaluation has both efficiency and equity benefits.

Encourage alternatives in input and output markets. Empowering farmers will also come importantly from alternative options in accessing inputs and selling their products. Competition and liberalization of export regimes will also enhance the farms' situation. Here also investments in projects and institutions supporting higher quality will contribute to this goal.

Implications for the Role of the Government in Policy Management and Public Goods and Services Provision

The development of supply chains and VC requires a *fundamental rethinking of the role of the government and policy-making*. Large companies develop

their own standards, their own extension services, their own supply channels, and wholesale exchange institutions, quality testing, etc. Some of these activities are in areas where traditionally governments were considered to play an important role. Hence, there are fundamental and difficult questions on the role of the government in such a changed environment.

Policy analysis and information gathering

Policy analysis is complicated by the emergence of VC for a number of reasons. One reason is that basic models of supply reactions to policy changes may have to be adjusted for the more complex organization of the supply system. Another reason is that traditional instruments of information collection on which policies are typically based do not usually include information on VC. Hence, information collection (e.g., survey instruments) may need to be explicitly designed or adjusted to account for this.³⁶

Rethinking traditional public investments

Traditional areas of public investment such as research and extension, market information systems, veterinary services, and animal surveillance programs require rethinking to take into account the role which VC plays in this area. Optimal government policies in a VC environment will be based on public-private partnerships.

Public-private partnerships: Supply chains as part of the solution, not the problem

Since private investments and strategies play a crucial role in the supply-chain process, collaborations between public authorities, nongovernmental organizations, and private companies should be at center stage. There are some successful examples of where such partnerships have contributed to positive developments from each perspective. For example, a recent collaborative project, financed by USAID, between the Michigan State University-based Partnership for Food Industry Development (PFID), South African retail chains, and local NGOs has led to the creation of a framework approach where small farmers access to seeds, services, finance, and output markets were integrated—much like VC in private-sector-driven models—and which has led to upgrading of small farmer supplies and integration of small farmer groups in South African supply

36. This is not just a problem in ECA countries, but almost everywhere. For example, a recent study by USDA/ERS points at important gaps in the understanding of markets in the United States as their information base does not capture important contractual developments (MacDonald et al., 2004).

chains. Retail chains are interested in working with USAID in Africa to replicate this system.³⁷

Innovative finance instruments: Finance the chain

A key conclusion from this report is that the most successful VC approaches have been nontraditional ones that address transition-specific constraints, are flexible, and allow adjustments to reflect changes in transition. Innovative instruments using chain-based financing have been developed in the private and the public sectors, and some have been very successful. In the annex to this report, we review several of these innovations, including: lending to farmers through associations, reverse factoring, quasi-WRP, leasing, contract-based lending without collateral, etc. Several of these are private initiatives and there is only a limited role for the government. In other cases (e.g., WRPs) there is a more important role in, e.g., the regulatory and legal system that is required for these instruments to function; or there may be a role in cofinancing seed money to start up some of these innovations. The key conclusion here 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.

Supply-chain development as part of a wider rural development strategy

Countries where small farmers make up a large share of the agricultural sector, and thus the supplier base, are typically characterized by significant overemployment in agriculture from a long-run development perspective. Significant productivity increases and growth can come from integration of the farm sector in modern supply chains and the associated inflows of inputs, technology, capital, and management. However, these beneficial developments are unlikely to solve all structural problems in the rural areas. Therefore, it is unrealistic to assume that in such countries all households currently employed or relying on agriculture will be able to be included in such a development. For a broader pro-poor development process, ultimately a broader process of rural development is needed with the creation of many off-farm employment opportunities in rural areas, or at least accessible for rural households. Supply-chain development models, even inclusive ones, can be only one part of such strategy.

37. This success contrasts with some other marketing projects where a similar approach was tried but with a strong focus on the supply side. The lack of attention to the demand side ultimately negatively affected the project as output markets were missing.

List of Background Studies and Related Studies

- "Dynamics in Vertical Coordination in the Romanian Dairy Sector," by S. van Berkum.
- "Vertical Coordination and Foreign Direct Investments in the Dairy Sector in Central Eastern Europe," by L. Dries.
- "Integration Processes in Agriculture-Industrial Complex: Agro-Firms and Agro-Holdings in Russia," by E. Gataulina et al.
- "Vertical Coordination in CIS Agrifood Chains," by J. White and M. Gorton.
- "Cotton Supply Chain Report," by M. Sadler.
- "Study of Dairy Chain in Azerbaijan," by E. Hidier.
- "Study of the Fruit and Vegetable Chain in Azerbaijan," by D. Giovanucci.
- "The Impact of Foreign Investment on Supply Chains in ECA: Lessons from a Survey of Dutch Agri-Food Multinational Companies," by S. van Berkum and J. Bijman.
- "The Rapid Rise of Supermarkets in Central and Eastern Europe: Implications for the Agrifood Sector and Rural Development," by L. Dries, T. Reardon, and J. Swinnen.
- "Study on Market Linkages in Slovak Agriculture," by G. Blaas, M. Bozik, J. Pokrivcak, and S. van Berkum.
- "Study on Rural Financial Constraints in the Framework of EU Accession of Lithuania," by W. Meyers, R. Naujokiene, and I. Krisciukaitiene.

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ANNEX 1

Importance of Contracting in ECA Agrifood Chains

There is no systematic evidence on the emergence of various forms of VC. But various sources do provide a set of information that allows drawing some conclusions. We first review evidence from cross-sectoral studies from several countries, both in CEE and CIS. Afterwards we look more carefully into specific sectors, such as dairy, cotton, grain, and others. The sector-specific approaches are important because the extent and nature of VC will differ by sector, reflecting commodity—and chain—specific characteristics.

Tables A1.1 and A1.2 present data on contracting on farms in the Czech Republic, Slovakia, Hungary, Bulgaria, and Romania based on representative farm surveys in these countries in the second half of the 1990s (1997 for Hungary and Bulgaria, and 1999 for Czech Republic and Slovakia).³⁸ The data show that

- Contracting was widespread among farming companies in all countries. Virtually all corporate farms were selling farm output on contract in Hungary, Czech Republic, and Slovakia. Notice that in these countries corporate farms produce a large share of the output.
- Contracting was much less widespread among individual farms, although there is a difference among individual farms. In statistics and surveys individual farms typically include both subsistence farms and more commercially oriented family farms. The Czech data allow to

38. Boger et al. (2001) find that in a survey of pork farms in two regions in Poland in 1999 about 13% of the farms had a formal contract and 70% had an oral contract; only 16% had no contract. Two-thirds of the oral contracts only specified time, quantity, and means of delivery, while one-third included quality and price premium specifications.

disaggregate the “individual farms” in “registered” (more commercially oriented) and “nonregistered” (more subsistence oriented) farms. The data show that contracting is much more widespread among registered family farms (46%) than among nonregistered farms.

- Contracting of farming companies was less developed in Bulgaria in 1997 than in the Czech Republic, Slovakia (1999), or Hungary (1997). This probably reflects progress in the restructuring and privatization of the agrifood industry, which had advanced the fastest in Hungary, and the slowest in Bulgaria in that period.

TABLE A1.1. Share of Farms Selling on Contract (as % of total)

Type of contract	Czech		Slovak	Hungary	Bulgaria
	NRIF	RIF			
Individual farms					
Selling crop products on contract	4	37	29	8	5
Selling livestock products on contract	1	13	4	10	3
Selling animals on contract	2	7	6	na	na
Selling on contract	5	46	35	17	7
Corporate farms					
Selling crop products on contract		79	82	86	42
Selling livestock products on contract		73	83	59	23
Selling animals on contract		49	77	na	na
Selling on contract		96	98	94	43

RIF, registered individual farms; NRIF, nonregistered individual farms.

Source: Leuven ACE datasets.

TABLE A1.2. Share of Czech Farms with Inputs Provided as Part of a Sale Contract (%)*

Type of input	Individual farms		Corporate farms
	Non-reg.	Registered	
Seeds	0	22	62
Feed grain	0	0	13
Hay or other fodder	0	0	1
Industrial fertilizer	0	21	66
Chemicals	0	17	63
Concentrated feed	0	17	72
Fuel for machinery	0	0	44
Irrigated water		0	25
Other inputs		15	44

*Share (%) of farms using that input in 1999.

Source: Leuven ACE datasets.

- Only for the Czech Republic do we have data on input provision for as part of the contract. The data show that a majority of corporate farms received seeds, fertilizer, chemicals, and feed as part of the contracts. The share among registered individual farms was only around 20%. Nonregistered farms did not receive inputs.

Another set of evidence comes from a study by White and Gorton (2004), who conducted surveys of 53 agribusiness enterprise executives from Armenia, Georgia, Moldova, Russia, and Ukraine that have made recent capital investments in the agrifood sector. The results of this survey, shown in Table A1.3, show that contracting has been increasing over the period 1997–2003. More specifically:

- Contracting between processors and farmers increased significantly between 1997 and 2003. Companies that used contracts with suppliers grew from slightly more than one-third in 1997 to almost three-fourths by 2003.
- Contracting is significantly higher for larger farms (around 75% of the companies contract with large farms) but contracting with small farms grew as well over the 1997–2003 period, and around 50% of them is now contracting with small farms.
- The use of spot markets is stagnating around 50% while contracting and also the use of other agents, such as intermediaries and traders, is becoming more prevalent.
- The study also indicates a strong growth in extreme versions of VC such as full ownership. In fact, the largest observed increase during this period was in the number of enterprises directly engaged in farming,

TABLE A1.3. Supply Relationships in Sourcing Raw Materials 1997–2003
(% of companies)

Relationship	1997	1999	2001	2003
<i>Spot markets</i>				
With all farmers	27.2	43.5	47.1	50.0
With small farmers	25.0	41.3	44.2	47.2
With larger farmers	15.6	25.5	25.5	23.1
<i>Contracts</i>				
With all farmers	41.3	61.7	73.1	77.4
With small farmers	36.2	43.8	46.2	49.1
With larger farmers	37.0	58.3	69.2	73.6
Own farms	6.4	8.3	17.8	26.4
Other agents	16.7	28.6	46.2	49.1

Source: White and Gorton (2004).

which increased from 3 (6%) to 14 (26%) of the firms—with most of this vertical ownership integration occurring recently.

The study also shows that the use of supplier support measures was introduced mainly after 1999, but has since been spreading to a larger number of companies and farms. Table A1.4 shows the different types of contract support measures being offered by the surveyed agribusinesses to their suppliers. These measures are listed in descending order of the frequency with which they are offered. Some conclusions are given below:

- Monetary credit, prompt payments, transportation, physical inputs, and quality control are the most commonly offered forms of support.
- Investment loans from processors to farmers, harvesting, and veterinary support are the most infrequently offered measures.
- When they are offered, virtually all farms benefit from prompt payments and guaranteed prices. A great majority of farms also take advantage of quality control, agronomic support, and market access support when it is available.
- Over 40% of processors in their sample offer credit to at least some of the farms that supply them; and 36% offer inputs, as per 2003 data.

TABLE A1.4. Importance of Supplier Support Measures

Support measure	% of Sample	Farms receiving this support in first year (%)	Farms receiving this support in current year (%)	Firms imposing minimum farm size for this measure (%)
Credit	43.4	39.8	50.9	60.8
Prompt payments	41.5	90.0	87.3	0.0
Transportation	39.6	67.5	76.2	45.0
Physical inputs	36.0	50.2	52.7	61.1
Quality control	34.0	75.5	78.3	16.7
Guaranteed prices	24.5	86.7	91.7	14.3
Agronomic Support	20.8	78.4	81.4	10.0
Farm loan guarantees	20.8	7.0	15.1	27.3
Machinery	16.9	10.4	22.8	66.6
Specialist storage	13.2	34.7	27.3	28.6
Business/financial management	11.3	45.8	47.5	50.0
Market access	11.3	68.3	69.7	0.0
Veterinary support	9.4	58.0	66.0	40.0
Harvest/handling	9.4	37.2	13.1	60.0
Investment loans	5.7	4.0	0.3	66.7
Average		57.0	60.7	34.0

Source: White and Gorton (2004).

- The percentage of farms that receive a specific form of support has tended to increase after the first year the support measure is offered. This is true for almost every form of offered support.

Finally, Tables A1.5 and A1.6 summarize a series of case studies discussed in greater detail in Foster (1999), Gow and Swinnen (2001), Dries (2004), and Van Berkum and Bijman (2004). The tables indicate that the introduction of farm-assistance programs by agribusiness companies is a common phenomenon across countries, and increasingly important in sectors, such as the dairy sector (see also the discussion of the dairy sector findings in the main report).

TABLE A1.5. Vertical Contracting and Support to Producers by Agribusinesses in ECA and CIS

Case number	Foreign investor	Foreign partner	Local firm or partners	Activity	Countries of investment	Producer type
1	UK/Fr sugar processor	–	Local sugar processor	Sugar production	Hungary, Czech, Slovakia	Sugar beets
2	UK sugar processor	–	local sugar processor	Sugar production	Poland	Sugar beets
3	Belgian beer producers	–	Local brewery	Malting	Romania, Hungary	Barley
4	Belgian malter	–	Local malting plant	Malting	Croatia	Barley
5	European seed merchant	–	Foreign food co.	Seed merchandising	Central and Eastern Europe	Crops
6	–	–	Oilseed producer	Vegetable oil production	Slovakia	Rape and sunflower
7	US combine producer	Ag. equipm. dealer	–	Equip. leasing and sale	Ukraine	Grain and oilseed
8	Swiss confectionary co.	dairy plant	–	Confectionary	Russia	Dairy producers
9	US dairy processor	Dairy plants	–	Dairy products	Ukraine, Moldova, Kazakh	Dairy producers
10	US food catering firm	Food catering	–	Fast food service	Russia, Ukraine	Vegetable producers
11	US nut processor	Facilities owners	–	Walnut processing	Moldova	Walnut growers
12	US agri-chemical mnf.	Ag. input distribut.	–	Fertiliz. and pesticide sales	Ukraine, Russia	Crop producers

Types of support	Case number											
	1	2	3	4	5	6	7	8	9	10	11	12
Training	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Credit access programs	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y
Input provision	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Machinery procurement	Y	Y	N	N	Y	N	N	N	Y	Y	Y	Y
Agronomical support	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Veterinary support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	Y	N/A	N/A	N/A
Harvest and handling support	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quality control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Transportation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Specialized storage	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bus. and fin. mgmt support	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Market access	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Timely payments	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Source: Based on Foster (1999) and Gow and Swinnen (2000).

TABLE A1.6. Farm-Assistance Programs Offered by Dairy Companies

Company name*	Credit—specific	Credit—general	Input supply	Extension service	Veterinary service	Bank loan guarantee
<i>Poland**</i>						
Mlekpól	Y		Y	Y	N	Y
Mleczarnia	N		Y	N	N	Y
Kurpie	Y		Y	Y	N	Y
Mazowsze	Y		Y	Y	N	N
ICC Paslek	Y		Y	Y	N	Y
Warmia Dairy	Y		Y	Y	Y	Y
<i>Bulgaria</i>						
Merone	Y(2000)	N	Y(????)	Y(1992)	N	N
Fama	Y(1994)	N	Y(1994)	N	N	Y(once)
Mlekimex	Y(1997)	Y(1998)	Y(1997)	Y(1999)	Y(1997)	Y(1998)
Danone	Y(1997)	N	Y(1998)	Y(2000)	Y(1995)	Y(1999)
Iotovi	N	N	Y(1995)	N	N	Y(1995)
Milky World	Y(1999)	Y(2000)	Y(1999)	Y(1999)	N	Y(1999)
Markelli	Y(1999)	N	Y(1998)	N	N	N
Mandra Obnova	Y(1998)	N	Y(2000)	Y(2000)	N	N
Megggle	Y(2001)	N	Y(2001)	Y(2001)	N	N
PRL	N	N	N	Y(2002)	N	N
Serdika 90	Y(1997)	N	Y(1997)	Y(1997)	N	N
<i>Slovakia</i>						
Liptovska	Y(2000)	N	N	Y(1994)	N	N
Mliekospol	Y(1999)	N	N	Y(1992)	Y(1992)	Y(1992)
Rajo	Y(2001)	N	Y/N	Y(1992)	N	N
Levicka	Y(1998)	N	Y(1998)	Y(0000)	N	Y(1998)
Tatranska	Y(2001)	N	Y(2000)	Y(0000)	N	N
Nutricia Dairy	Y(2000)	N	N	N	N	Y(2000)
<i>Romania</i>						
Danone	Y		Y	Y		Y
Friesland	Y		Y	Y		Y
Promilch	Y		Y	Y		Y
Rabaul	N		Y	Y		N

*Either the company provides inputs and the farmer pays back later, or the company offers forward credit, which the farmer uses to buy inputs.

**In Poland, no distinction is made between credit for dairy-specific investments and general investments. Farm-level evidence shows that the dairy companies mainly support dairy-specific investments.

Source: Dries and Swinnen (2004) and Van Berkum (2004).

ANNEX 2

Variations in Vertical Coordination Models

Vertical coordination, both in terms of its type and extent, may differ by commodity, country, company strategy, etc. Here we review a series of structural differences in observed forms of VC which are important to understand.

Various Companies Can Initiate Vertical Coordination

The discussion in the report focused mostly on companies purchasing farm output (processors, traders, supermarkets) as initiators of VC. However, like food processing companies, agribusiness companies trying to sell farm inputs, such as seed, machinery, fertilizer, etc. face important problems. They are confronted with farms that cannot pay for their inputs because they are not paid in time, or who do not have output markets for their products. They ask “how can we ensure that we can sell our products and get paid for them?” The answer is: by assisting our customers (the farms) in finding market outlets for their products.

To ensure payments by farms, input suppliers have engaged in a variety of, sometimes quite unconventional, forms of contracting. For example, in one case in Ukraine, described by Foster (1999), a US farm equipment manufacturer partnered with local farm equipment distributors to sell combines and tractors to farms. The US company provided a large inventory of equipment for the distributor to sell on credit and service. The farms received the equipment for a 25% down payment (in cash or kind) and after three additional payments received ownership. The equipment dealer, to ensure payment, was given the rights to certain agreed upon grain area as repayment; in addition, the equipment dealer was given the rights to harvest, transport, store, and sell the grain himself. Further, as part of the arrangement, the equipment dealer and the transactions themselves provided the farms with training and skill development.

Sometimes different models develop because processors themselves do not have access to finance. In some cases this induced VC driven by financial groups, such as by Rabobank international in Central Europe, or by financial groups in Russia. Another example is from the Ukraine oilseed sector in the 1990s. There, farmers preferred to sell seed to trading firms through barter contracts against inputs, such as agricultural machinery and fuel oil, rather than to crushers. Because processors had poor access to credit, traders, equipment suppliers, and even banks procured seeds for the oilseed crushing factories. Many farmers 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).

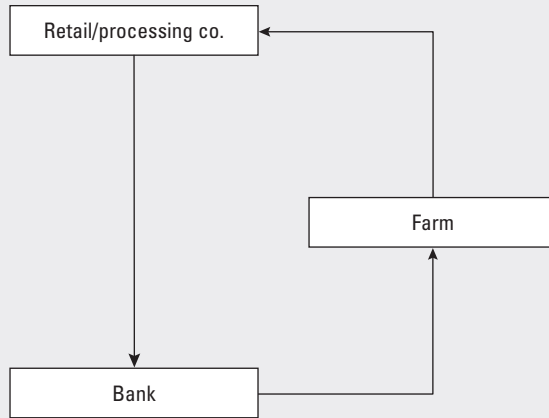
Alternatively, if domestic sources of finance are lacking, with tradable commodities foreign traders may provide the necessary finance for the whole chain. For example, in the Ukrainian oilseed sector, multinational traders purchased oil seeds locally from Ukrainian farmers and elevators and then had the seeds crushed by local crushers, which purchased part of the oil from the multinational. A similar development occurred in the Kazak cotton chain, where contracting between domestic private cotton gins and international cotton traders provides the gins with financial means to prefinance the farms' inputs (see Sadler, 2004).³⁹

Complex Models

In several cases, we find VC with several companies involved in the contract. For example, VC sometimes includes both input supplying companies and processing or trading companies. VC then implies contracting "around" the suppliers. Examples are agricultural pesticide companies in Bulgaria who, in order to ensure payments for inputs delivered to farms, collaborate with local grain trading companies to market the grains of the farms to which they delivered inputs.

First, *triangular structures* are used by processors and retailers to bring in financial institutions in the contract. Examples of this are processor or

39. Interestingly, the resulting ownership structure here 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.

BOX A2.1**Triangular Structures**

Example: Retailer/processor provides loan guarantees for bank loans to suppliers

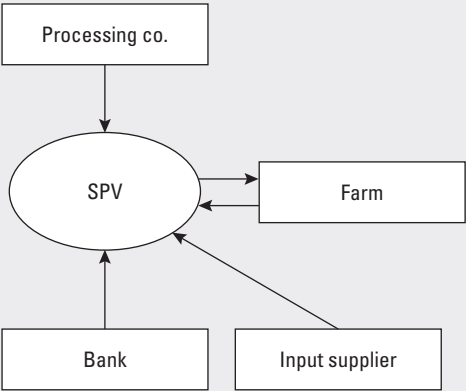
retailers who provide loan guarantees to financial institutions for loans to their suppliers. The underwriting is for specific loans, related to the contract, and restricted for contracting suppliers. Box A2.1 illustrates such triangular structures that are fairly common. They are implemented by sugar processors in Slovakia (see Gow et al., 2000), by retailers in Croatia for F&V supplier investments in greenhouses and irrigation (see Reardon et al., 2003b), and by dairy processors in several countries (see Dries and Swinnen, 2004).

Second, an even more complex example of vertical integration “around” the farms, where both input suppliers and processors are included, is the use of so-called *special purpose vehicles* (SPVs). An 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 includes all provisions on output, inputs, and credit (Box A2.2). 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.

An important advantage of such an 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

BOX A2.2

Rabobank's Special Purpose Vehicle



Example: Foreign investor is financial institution and the special purpose vehicle (SPV) is used to distribute risk equally among partners.

Example: Group of small farmers formed cooperative to participate in SPV.

of the risk between various agents, and, hence, will stimulate investments by companies who otherwise may be deterred by the risk.

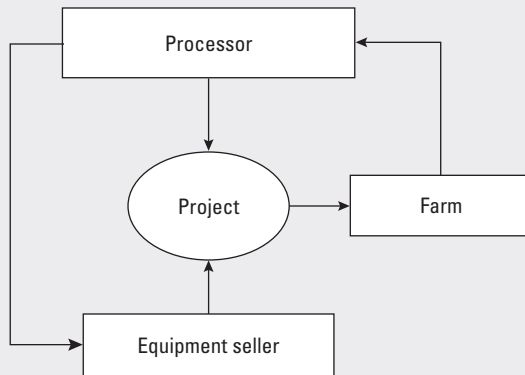
In some cases, such structures have developed with farmer participation. For example, Gow and Swinnen (2001) report that in Eastern Hungary a group of sheep farmers set up a producers' cooperative through which they participated in an SPV-like joint company. This gave them more bargaining power vis-à-vis the other partners, much in the same line as a marketing or input purchasing co-operative does in a normal environment.

Another variation with farmer participation is from the Czech Republic, where modern retailer investments and the associated increase in standards and supplier requirements have induced the creation of producer marketing organizations (PMOs). The main reason for their establishment was to gather sufficient quantity and product variety to satisfy the requirements of large supermarkets chains (EBRD/FAO, 2004). However, in addition to reducing transaction costs and increasing bargaining power, the PMO provided important services to their member farms, such as extension services, storage, sorting and packaging, and information. Furthermore, PMOs enhanced access to inputs and to bank loans for their members by providing guarantees to input suppliers and banks (Dries and Van Kerckhove, 2004).

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 the region of Nischnyj-Novgorod for the modernization project “Milkdrivers.” This project plans to modernize the milking equipment on the farms through leasing contracts. Practically all dairy farmers in the area have to modernize and upgrade their equipment and facilities, but only a few have the financial resources to do so (see Box A2.3). The program allows dairy farms to lease milking equipment. They have to cover about 20–30% of the costs themselves and receive the equipment based on a 3–5 year leasing basis. The principal balance can be paid off by the farmers through delivering the raw milk to one of the dairy processors owned by WBD. The main condition in order to take part is the compliance with WBD quality standards. The equipment is being delivered by De Laval. The project costs are shared by WBD and De Laval.

BOX A2.3

Leasing of Dairy Equipment by Joint Leasing Project (Wimm Bill Dann (WBD) and De Laval)



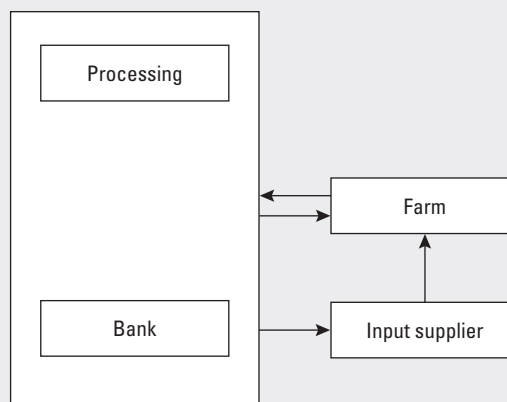
Source: Top Agrar, 2004

Another interesting VC model is discussed in Van Berkum’s report on the developments in the Romanian dairy sector (see Box A2.4). He reports the case of Danone, an international food company, which has developed an expensive finance scheme for farms, including a triangular structure with input suppliers. But Danone goes further than most other

BOX A2.4**How Food Processors Become Financial Institutions: Loans and Collateral in Contracting with Danone in Romania**

Danone has made prefinancing inputs a corner stone of its farmer-development program in Romania. The company supports farmers who are aiming at improving their business through investments in inputs like (spare parts of) field machinery and milk installations, and through purchases of feed compounds (concentrates), milk powder (as cattle feed), and detergents (of milking equipment). A farmer may apply for these inputs only after he has delivered good quality milk to Danone for at least 6 months, and when he has a certain minimum size. Furthermore, together with the requests for inputs one needs to submit a business development plan. If Danone accepts the plan, the company and the farmer make a contract. Dependent on the investments to be made, Danone agrees to buy the farmer's estimated milk production 1, 2, or a maximum of 3 years in advance and pays the farmer a sum of money that he is supposed to invest in the inputs agreed on. Danone normally takes the farm house and the land as guarantee for nondeliverance of milk or breach of contract. Danone then provides a security to input supplying companies, who are then willing to deliver the inputs to the farmers. The contract is signed in a notary's deed.

Danone offers this assistance only to medium and larger farms, with a minimum of 20 cows. In the Romanian context, which is dominated by two-cow farms, this severely limits the impact of the program.



Source: Van Berkum (2004).

companies as it takes collateral itself from farms for medium-term investments for which it provides loans.

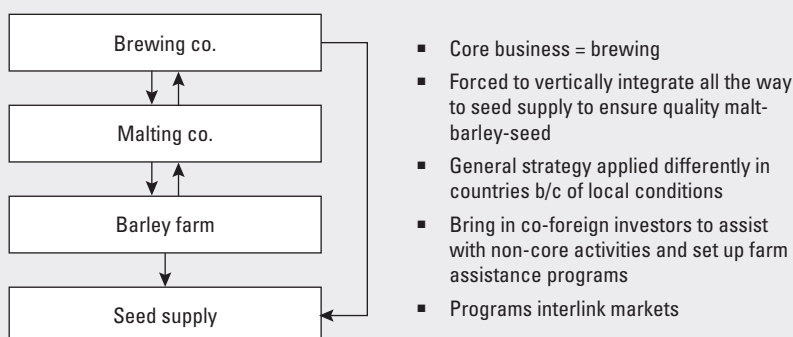
Multiple Stages

Another example of complex VC is where the VC includes multiple stages, sometimes more than three, which complicates the enforcement problems. This is the case, for example, with brewery investments or some cotton chains (see Box A2.5).

Interbrew, a multinational brewery holding that made extensive investments in ECA countries, has introduced contracts with barley farms via malting companies and international consultants. In this strategy, it collaborated with foreign malting companies to ensure high-quality malt, to be arranged from imported malt or barley if possible and otherwise from domestic barley producers. For this, Interbrew put up an amount of capital to prefinance import and breeding of high-quality seeds, training of barley specialists to supervise the barley growing via international consultants, etc. In Russia, this VC strategy included international experts managing the actual barley farms.

BOX A2.5

Four-Stage Models: Brewery Investments



An alternative version of this model is where the malting company is the driving investor, often in collaboration with brewing companies. For example, Soufflet, a large international malting company, signed a framework agreement with EBRD for investments in several ECA countries where it contracts with barley farms to provide high-quality

barley. These strategies are linked to EBRD financial investments by international brewers, such as EFES, who use Soufflet's malt, e.g., in Russia.

As should be clear by now, VC is not a black or white issue. It is, instead, a choice of a set of institutional arrangements that vary between a spot market arrangement and full ownership of the supplier by the processor (or vice versa). The examples discussed so far are of an intermediate form whereby there is more coordination than a spot market, but less integration than full ownership.

In most cases it implies some form of output contracting in one direction and technology, input, and marketing assistance the other direction. However, in some cases the vertical integration has gone much further.

Full Vertical Integration: Ownership

The most extreme version is when processing or trading companies actually *take ownership over the farm and fully integrate it in their company*. This is what happened in some cases in some of the CIS countries. For example, both in Russia and in Kazakhstan VC took extreme forms as traders and processing companies took over ownership of farms.

In the northern wheat belt of Kazakhstan, many bankrupt farming cooperatives have been taken over by grain trading and investment companies after 1998, when the government imposed bankruptcy proceedings. Box A2.6 presents several of these cases. Grain companies are now one of the dominant types of farming in the north of the country. These are companies that have been acquired by specialized grain production and trading companies with substantial financial resources, usually accompanied by vertical interests in the grain marketing process. Examples of this organization mode are shown in Case nos. 2 (Bisco-Trade) and 3 (Zhambul farm). Food companies are also investing in farming: Case no. 1 (Arai JSC) is an example of this category. In several cases the farms that are managed by these integrated companies are very large; sometimes more than 100,000 hectares of farm land (see, e.g., Case no. 2).

Chain-Based Financial Instruments

Several of these institutional innovations that we have reviewed so far can be considered as nontraditional methods for providing financing to farms, which have developed to overcome specific constraints in transitional economies. Contracts and incentive structures have been designed to overcome working and investment capital constraints, a weak collateral base, information and enforcement problems, etc.

BOX A 2.6

Integrated Grain Companies in Kazakhstan

Case No. 1: Perelyevsky Cooperative Farm incurred debts since 1992 to the budget (tax, tax arrears penalties, and pension contributions) and to the Arai Joint Stock Company (JSC) food complex, which had contracted the entity to supply wheat. The livestock population fell from 7800 in 1986 to 1700 in 1996. After bankruptcy, the farm was auctioned in 1997 and Arai JSC acquired all assets. The farm now forms a branch of Arai JSC, an integrated complex of companies comprising grain, meat, and milk production and the production of alcohol, soft drinks, and beer. Land shares have been formally transferred to Arai JSC by all former owners in return for a commitment for regular wage income for all employees. Conditions improved radically after the takeover with an influx of working capital and investment. The full former labor force has been retained on the farm. The cattle herd has been rebuilt to 4200, and the company produces wheat on 4000 hectares of land.⁴⁰

Case No. 2: Bisco-Trade is an investment grain company which has taken over several bankrupt farms. The acquisitions followed poor experiences with contract farming as contracts could not be enforced through the courts. The company could choose from a large number of bankrupt farms which the company could choose among as most were in desperate conditions. It currently owns 11 farms covering 220,000 hectares. In 1999, the company cultivated 120,000 hectares of wheat and barley, with the remainder left fallow as part of the rotation.

Case No. 3: Ivolga ISC, a large grain trading company owns 23 farms, most of them acquired after farm bankruptcies. The company's farms produce grain, vegetables, and potatoes. The company owns 12 grain terminals and elevators.

Case No. 4: Agrocenter was one of 20–30 companies contracting farms in the wheat growing belt, which together contracted for one-half of all the cultivated wheat area in Kazakhstan. In 1998, the company contracted 11 former state farms totaling about 400,000 hectares. The company provided spare parts, chemicals, and seeds and met the wage bill for an agreed employment level. In 1999, these mechanisms led to large outstanding debts, when farms had accepted inputs on a barter basis but were hit by the drought and unable to deliver to pay off their input loans. The difficulties experienced with contract and debt management following the 1999 drought caused Agrocenter to withdraw from contract farming in 1999.

Source: Gray (2000).

40. The company has discontinued financing of the basic social services that are legally the responsibility of the raion authorities (notably teachers' salaries). However, it uses its leverage as a major taxpayer to the raion to obtain assurances that raion obligations are in fact met (unlike in most neighboring entities). The company has undertaken a major investment in gasification of the entity, including housing and heating for the school and other facilities.

In this last part of this section, we present three additional ways of how processors, and in one case the government, have tried to overcome these problems in practice.⁴¹

Lending to farmers without collateral through associations

In Romania, the farmers association ISPA created a joint venture with a private milk processor ProMilch in Romania, and became majority shareholder. ISPA provides loans to small farmers with the assistance of a Dutch fund—received from Rabobank on very attractive terms. It provides small loans to farmers who want to invest in animals, (re-)construction of stables and/or equipment. Farmers qualify for a loan through an interview in which they have to indicate their business plan. An average loan is around Euro 400, with a maximum of Euro 2000. ISPA loans are to be repaid after a 6–18 month grace period for animals, and 4-year grace period for construction investments.

Farmers do not have to provide any collateral; the milk delivered is considered the “collateral.” Eligibility criteria for loans include several elements. First, the farmer needs to have a durable relation with ISPA. In practice, ISPA requires a delivery period of at least 6 months but preferably 1 year. Important is that a farmer uses an appropriate fodder base at his farm and agrees upon a commitment for further expanding the farm. ISPA personnel, who generally have a close contact with all individual members, need to confirm the assessment on eligibility. The requirements are, however, not too strict and subject to ISPA staff assessments. Trust and reliability are important. ISPA deals with the default risk by having a solidary liability of both the loan beneficiary and the milk collection centre staff who guarantee for the reliability of the loanee (Van Berkum, 2004).

41. An interesting new instrument with potential importance for transition countries has been developed in Brazil. The Cédula de Produto Rural (CPR) is a tradable Production Certificate offered by the Banco do Brasil to Brazilian farm producers, cooperatives, and cattle ranchers. Producers can sell the CPRs they have been issued to commodity buyers, by trading them in domestic commodity exchanges or by selling them through e-commerce with other Banco do Brasil customers. For producers who choose to trade their CPRs, they act like forward contracts. The producer granting the CPR receives cash immediately from the Banco do Brasil, in an amount determined by prices on futures markets or by price averaging, in exchange for a promise to pay the amount, through the delivery of physical produce or money, to the buyer of the CPR at a fixed date (when the contract “matures”) sometime within 1 year from the date of issuance, at the end of the current harvesting or processing cycle. The value of the CPRs depends on the type of commodity, the phase of production, and indices of historical production and technical capacity. Today, the Banco do Brasil offers a majority of all credit financing in Brazil. In 2004, 40% of the credit it issued was granted to agribusiness companies. A significant and fast-growing portion of this credit—3 billion Reals (\$965 million) in 2004—was issued as CPRs.

Leasing

Leasing can be seen as a specific kind of financial contracting between input suppliers and farms. The system was developed in the ECA region to overcome collateral problems. Often leasing was introduced by agribusiness companies supplying equipment and farm machinery to sell their products to farms that could not come up with the necessary collateral for loans. Even when the companies selling the equipment had sufficient financial means to introduce the system, problems with enforcement may prevent the system from developing. If the company cannot reclaim the equipment in case of nonpayment by the farm it will not be willing to provide the leasing contract. In many ECA countries this is a serious constraint.

There is little information on how important private sector leasing has become in the agrifood chains, since there are no formal statistics on this. Ad hoc discussions and interviews with agribusiness companies suggest that it is being used in many ECA countries, and it appears as an instrument with large potential in transition environments, as was illustrated by the Russian dairy case we discussed earlier (see Box A2.3).⁴²

Reverse factoring

Innovations are taking place in financing supply chains in Western countries, with potentially important spillovers for transition countries. For example, Rabobank International has developed a financial instrument (reverse factoring, RF), which is designed to finance the supply chain (supplier-retailer/processor) and to make use of the better credit ratio of

42. Also in leasing, the Russian government has taken an active role. *Rosagrosnab* is a large government-designed leasing program for agricultural equipment, which had major problems and was revised later. Government funds were allocated and managed by *Rosagrosnab*, which entered into leasing agreements with the oblast-level suborganizations, which in turn entered into subleasing agreements with local (rayon) level agrosnabs. The latter leased equipment to farm producers. Farms were asked for upfront cash payments of 30% of the value of the leased equipment, followed by 3–5 years of additional payments, ending in a transfer of ownership. However, the heavy handed government involvement was problematic. The large number of intermediate organizations resulted in high prices for farmers. The centralization of purchasing and allocation decisions also meant that farmers had very limited choices as to the type or manufacturer of the equipment they could lease. Lack of competition meant that machine producers and lessors had no incentives to improve their efficiency or quality standards. Significant problems also existed in the ability of the leasing companies to repossess equipment in cases of nonpayment. Often farmers did not realize that they would not assume ownership until the end of the lease, and in other cases where local officials were able to block attempts by leasing firms to repossess their equipment. As a consequence, the leasing program was modified in 2001 (Csaki et al., 2002).

the retailer/processor to address the working capital needs of suppliers. For suppliers under contract, or short listed by the retailer or processor, the bank prepays the supplier to address their working capital constraints, quasiguaranteed by promissory notes provided by the retailer/processor based on delivery contracts.

This system is thought to be particularly useful with new requirements being imposed on the supply chains, related to traceability/transparency, fair trade, biosecurity, etc., to address constraints imposed on suppliers, which they may not be able to address by themselves. In addition, the instrument could be seen as a risk-mitigating instrument as the risks are being distributed between more agents in the chain. These issues of overcoming financial constraints and distributing risk among partners in the chain are very similar to the issues we discussed in the “complex contracts” section in this report.

While Rabobank International is just introducing this system in Western Europe to selected companies, the principle of the financing scheme seems particularly interesting for transition countries, where processors and retailers are often in a much better position to get access to bank loans than suppliers are, for a number of reasons including collateral base, loan history, lower transaction costs, transparency, etc. Currently, a study is being implemented by the World Bank to look into this and related schemes for financing farms and small suppliers in developing and transition countries.

Warehouse receipt systems

Warehouse receipt systems (WHR) have proven to be a successful instrument in providing finance in the supply chains for transition countries, in particular for storable commodities such as grains. Such systems are now actively and successfully operating in several ECA countries. The benefits can be large. 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.

Interestingly, informal WHR systems have developed without waiting for the necessary government regulations. For example, in Ukraine in 2002, banks were making contracts with elevators who held 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 WHR 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-WHR system” has developed and is widely used to collateralize inventories (e.g., of grains and oilseeds) in a number

of transactions (Csaki et al., 2002).⁴³ These quasi-WHRs were commonly used in preexport or preimport transactions and in domestic agribusiness transactions. These transactions would involve inspection by a bank or international organization that issued credits and assumed responsibility for losses until the commodity was transferred. Domestically, the use of stored commodities as collateral in credit agreements was somewhat less sophisticated. Loans were often extended based on political or personal relationships.

In the absence of a regulatory system, there are important enforcement problems. In both Ukraine and Russia, there were problems in enforcing informal storage contracts with elevators or warehouses. In Ukraine, farms claimed they were cheated by elevators in both quantity and quality of their deliveries and oilseed crushers had problems retrieving their seeds from the elevators (EBRD, 2002). In Russia, banks use their own collateral inspectors to physically inspect the warehouses and may post their own security guards at the warehouses. In times of high uncertainty, such as during and immediately after the 1998 crisis, the banks insisted on higher collateral requirements and combining warehouse receipts with other collateral, unless loans were guaranteed by the government. Often the transactions were based on warehouse acceptance receipts from the Soviet times ("form 13"), which was subject to manipulation and fraud. Yet, the fact that such systems developed and spread widely despite these imperfections, indicates the huge gains in efficiency from institutions supporting exchange and the large potential for better regulated systems (Csaki et al., 2002).

Russian-Style Vertical Coordination

*Agroholdings*⁴⁴

After the 1998 Russian financial crisis, several factors coincided to cause profound changes in the vertical organization of the Russian agrifood system. First, the dramatic devaluation of the ruble profoundly changed the competitive position of domestic production compared to imports. Second, trading and processing companies faced an acute shortage of raw materials as imports became very expensive, while local supplies were either not available or of low quality. Third, growing social tensions put pressure on local and regional authorities to look for a solution to the

43. The devaluation of the ruble following the 1998 Russian financial crisis resulted in significant losses to participants who held quantities of stored commodities through these programs, temporarily limiting them. However, the programs began to re-emerge in 1999–2000 with even greater domestic bank participation.

44. See Gataulina et al. (2004) and Rylko (2002) for more details.

continued crisis in agriculture and rural areas. Fourth, due to changed macroeconomic incentives and exchange rate realignments, a number of Russian nonagricultural companies became interested in investing in the food industry.

In a number of regions, local authorities encouraged Russian companies to invest in the agrifood system by offering privileges and guarantees. A number of large companies, including large industrial conglomerates such as the Stoylensk Ore Mining and Processing Plant, “Norilsk Nickel” and Gazprom, invested in the food industry and agriculture through vertically integrated business models.

As a consequence of this process, the largest industrial holding, Gazprom, became the largest agricultural holding as well, with 91 agricultural enterprises in its structure controlled by 25 Gazprom daughter holdings. Some of these daughters were unprofitable because they controlled mostly bankrupt agricultural enterprises that held large debts.

The vertical integration process is most active in the Belgorod and Orel regions. In Belgorod, more than two-thirds of all agricultural enterprises are part of such integrated companies. By 2002, these companies used almost 80% of the land while employing 25% of the farm workers.⁴⁵ In the Orel region, the three largest holdings used 41% of all arable land and employed 25% of all people employed in agriculture. The total share of vertically integrated holdings in resource use and regional output is around 50%.

To illustrate the size and scope of the holdings, Box A2.7 lists several cases.

Benefits offered by local and regional authorities included budget financing and cheap credit in the Orel region and land assets, acquired by forcing landowners to cede land shares as capital in new companies, in the Belgorod region. The first holding in Belgorod was created in December 2000 after the Governor of the region “asked” the head of the Stoylensk Ore Mining and Processing Plant to invest in agriculture. Land owners, through the exchange of land shares that they used as capital,⁴⁶ owned 49% of the company and investors owned the remaining 51%. In Orel, the regional governor, an influential politician, also played a key role in launching the process of vertical integration. His influence allowed companies to secure financial resources and external investment against securities of the local authorities.

45. Compared to an average of less than 25% in other regions of the Central Black Earth region.

46. Thus, the new company de facto owns all the land.

BOX A2.7**Agroholdings in Russia****Case 1: Orel Niva holding**

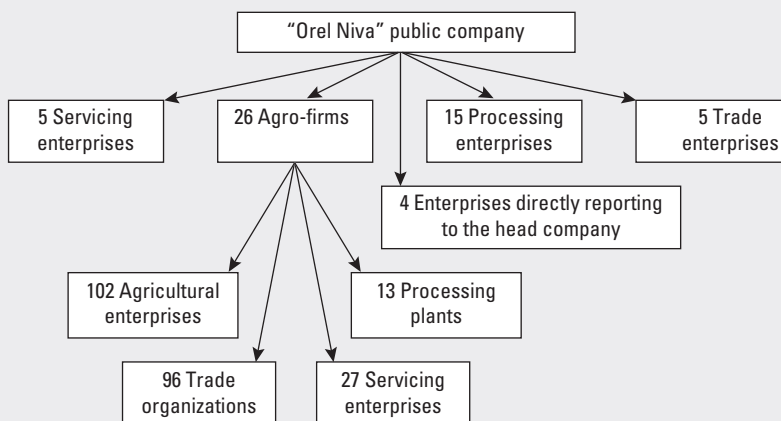
Orel Niva controls 337,000 hectares of land and employs 16,000 workers. It processes 200–300,000 tons of wheat. Its activities include 102 large farms, 28 processing plants, 100 trade organizations, 32 service enterprises, etc. (see Box A2.8 for a scheme of the structure of the company).

Case 2: Pshenitsa-2000 Orel holding

This holding received a significant (40 million US\$) capital injection from Germany including new machinery, etc. The company controls almost 100,000 hectares of land and employs more than 3000 employees. Despite massive investments profitability is poor and debts have accumulated over recent years.

Case 3: Orel Agro holding

Orel Agro employs 12,000 people and controls around 200,000 hectares of land. Its activities include, except for many grain farms, dairy and pig production, animal and dairy processing companies, grain elevators, etc.

BOX A2.8**Structure of “Orel Niva Public Company”**

Source: Gataulina et al (2004)

The leading motive of the regional authorities in Orel for assisting in the creation of agrofirms and large regional holdings was “to actively employ methods of state control to preserve and develop the agroindustrial sector of the region, to rehabilitate bankrupt agricultural enterprises, to provide the enterprises with fixed and current assets, and to restore the broken integration links.” The Orel region was to become a model for developing a regional agricultural sector under market conditions but with a strong controlling role of the state.

Impact of VC on Russian agroholdings

The creation of huge agroholdings in Russia has significantly affected the performance of the farms. Interestingly, the results appear to be quite mixed. Gataulina et al.’s (2004) study finds are that vertical integration has contributed to:

- A better supply of inputs to farms.
- Growth in output and productivity.
- Poor financial results.
- Important heterogeneity among the farms. Some of the integrated farms with good management seem to have performed very well.

The three holdings in the Orel region, which are described in Box A7, all operate between 100,000 and 300,000 hectares of land. Their main agricultural activity is grain production. Grain productivity in the Orel region has increased strongly since their creation in the late 1990s, increasing by 62% from 1999 to 2002 (an average of 20% per year), helped also by strong increases in real grain prices.

However, the profitability of grain, milk, and pork for these vertically integrated farms has been decreasing during the same period (see Table A2.1). The holdings performed consistently below the regional average (see Table A2.2). Moreover, they have accumulated substantial debts since their creation.

TABLE A2.1. Performance Indicators for the Agrofirms of the “Orel Agro-Complex”

Indicators	1999	2000	2001	2002
Profitability of agricultural activity, %	25.5	25.3	20.3	4.7
Profitability of crop production, %	74	49	32	12
Grain yield (kg/hectare)	1180	1640	1710	2160
Grain yield, index	100	139	145	183
Profitability of milk sales, %	27	26	3	–18
Profitability of meat sales, %	47	18	21	12
Profitability of pork sales, %	–8	–27	–21	–32

Source: Gataulina et al. (2004).

TABLE A2.2. Performance Indicators of Agricultural Enterprises of the Three Largest Holdings in the Orel Region Compared to Regional Averages of all Farms (2002)

Indicators	Orel Niva	Orel Agro- Complex (12 agro-firms)	Wheat— 2000	Region average*
Grain profitability, %	8	13	–45	19
Profitability of sold milk, %	–6	–11	–4	2
Profitability of sold pork, %	–39	–23	–38	–25

*Average values for large and medium enterprises in the region (per Goskomstat database for 2002).

Source: Gataulina et al. (2004).

Hence, while the vertical integration process seems to have contributed to sometimes spectacular growth in output and yields, the profits of the vertically integrated farms seem to have been worse or not better than those of nonintegrated farms. In both the Belgorod and Orel regions, farm debts accumulated over the 2000–2002 period, particularly on the vertically integrated farms. For example, in 2002, among the 149 agricultural enterprises vertically integrated in 19 holdings in Belgorod only 39 were profitable, down from 84 in 2001. The main problem is the same problem that plagued the Soviet-style agroholdings: poor allocation of resources, bad management, and the imposition of social and political objectives on economic institutions.

A key problem with management is the authorities' interference with production plans and with decisions relating to which activities (and companies) should be maintained by a holding, sometimes imposing unprofitable activities and companies on the holding.

Through direct and indirect state ownership, there is significant involvement of the state in the management of the agroholdings and agrofirms in both the Orel and Belgorod regions. Some of the holdings receive(ed) significant budgetary support from the regional governments. However, even the management of "private" holding companies "need to take into account that any reorganization of agricultural business cannot avoid coordination with local authorities," which have their own objectives and preferences. Holdings of all types "have to accept certain social obligations," which can negatively affect their profits knowing that "in return, authorities grant agroholdings certain privileges."

For example, Orel Agro holding receives interest-free loans from the Orel regional government in return for supplying grain (175,000 tons in 2002) to the regional food reserve fund at prices set by the regional authorities. The regional administration also determines minimum prices and marketing margins for milk. It also "requests a mandatory submission of production-financial plans on a form provided by the Ministry of

Agriculture of the Russian Federation. They insist on their own figures and values, most often arable lands and gross charges, cattle population, volumes supplied to processing factories; and in doing so they show little concern [whether] the firms' resources match the values under discussion. Ignoring the demands expressed by the [local authorities] can lead to displeasing results, therefore most often the decisions are passed on a consensus basis."

Another example is the case of "Soskovo" public company, an agrofirma⁴⁷ created on the foundation of the district dairy plant in 1999, the management of the company planned to incorporate only the best dairy farms from the region to create a good raw material (supply) base. However, following a "strong request from the authorities," three agricultural organizations with a "very weak financial position" (essentially bankrupt farms⁴⁸) were also integrated into the firm.

Yet, Soskovo is a very interesting case study. It shows that in some cases, where good management is present, dramatic improvements in performances of companies can take place within these vertically integrated structures. The management improvements have yielded spectacular results. Between 1999 and 2003, labor efficiencies and farm yields increased dramatically on each of the Soskovo farms despite significant reductions in numbers of employees. Yields increased for every product type in each of the farms, with an average increase in yields across all farms and products of 176%, i.e., 44% per year. Due to these increases, the profitability of the farms also increased.

However, the management of Soskovo, which explained the success of this case, appeared more exceptional than typical. This explains why the overall holding story is less successful. There are problems of sustainability and replicability of this model as the management position is unclear and since the personality of management seems to be a key factor.

The overall conclusion is that the re-creation of vertical integration in these Russian regions by local authorities has coincided with a strong increase in yields while at the same time not increasing profits probably because the misallocations are also reintroduced. However, allocating causality requires further analysis since the yield increase is not higher than that of nonintegrated farms in the region. Hence, it is not clear what the impacts have been.

47. An agrofirma is a more integrated structure and is typically a unit within an agroholding.

48. According to the study, based on evidence of the public company executives, in these enterprises no wages have been paid for 3 years, land was not cultivated, only one tractor was operational, land remained unfertilized, in several enterprises no turnover of cattle took place during several year's time. The discipline of workers was extremely low.

ANNEX 3

Vertical Coordination with Small Farmers

In most transition countries, farms vary widely in size and organization, from small household plots, over family farms, to large cooperatives or farming companies. For example, in Slovakia, almost all land is used by large farming corporations, while in countries such as Albania, Azerbaijan, etc., almost all land is used by small individual farms. Other countries have large differentiations internally by region or commodity. For example, in Kazakhstan, the northern regions are dominated by vast grain-producing farming corporations, while the cotton areas in the south are dominated by very small household farms. In Russia, the vast majority of the land is used by large farms, but around 60% of agricultural output is produced by household plots.

A key concern is that this process of VC will exclude a large share of farmers, and in particular small farmers. There are three important reasons for this.

First, transaction costs favor larger farms in supply chains. There is an important fixed transaction cost component in costs of exchanges between farms and companies, making it more costly for companies to deal with many small farmers than with a few larger suppliers.

Second, another reason that may reinforce the first factor is that when some amount of investment is needed in order to contract with or supply to the company, small farms are often more constrained in their financial means for making necessary investments, either because they do not have sufficient own resources or because they have problems accessing external funds in imperfect rural financial markets.

Third, an additional reason is that small farms typically require more assistance from the company per unit of output, because they are more likely to lack essential management capacity or because they are less likely to have at least some of the investments themselves. For example, before the

vertical integration process started, large dairy farms in Slovakia had cooling tanks and dairy specialists, while small Polish dairy farms had neither.

The concern of the exclusion of small farmers is voiced often and raised in many studies, in particular also in the emerging literature on the impact of the growth of modern supply chains, which emphasize the shift to larger preferred suppliers and the exclusion of small farms (e.g., Reardon and Berdegúé, 2002).

However, what *empirical evidence* do we have on the exclusion of small farms from vertically integrating supply chains? We looked at empirical evidence from transition countries and from emerging and developing countries. Interestingly, the two sets of empirical evidence show a largely consistent picture. Our studies and interviews with companies generally confirm the main hypotheses coming out of global observations:

1. Transaction costs and investment constraints are a serious consideration.
2. Companies express a preference for working with relatively fewer, larger, and modern suppliers.
3. Empirical observations show a very mixed picture of actual contracting, with much more small farms being contracted than predicted based on the arguments above.

Empirical Evidence

The CIS study by White and Gorton looked at both the share of small farms in contracting relationships with suppliers and at the terms and conditions of the contracts. They find no evidence that small farmers have been excluded over the past 6 years in developing supply chains. In the vast majority of cases companies have the same or more small farmers in 2003 than in 1997. In fact, 57% of the processors had more small suppliers in 2003 than in 1997. Moreover, the processing companies indicate, on average, that they are not likely to cut suppliers in the future. Interestingly, for those that expect to deal with less suppliers in the future, this expectation is based mostly on choices made by farmers themselves who may move out of small-scale agriculture and into more rewarding activities either inside or outside agriculture as the economy is improving.

In terms of the supplier assistance that small farmers receive, White and Gorton find evidence that better and more assistance seems to go to larger farms, although there is significant variation with the type of assistance.⁴⁹ For example, there is little difference in the provision of quality control,

49. They define "small farm" as having less than five cows (in dairy) or operating less than 1 hectare.

guaranteed prices, agronomic support, prompt payments, or even farm loan guarantees between small and large suppliers. However, the majority of companies operate a minimum supplier size for providing credit, physical inputs, machinery, etc.

In his study on the Romanian dairy sector, van Berkum also finds that VC does not exclude small farmers from the supply chains and that all major companies contract with small farmers, but that more sophisticated supplier-assistance programs tend to be more available for larger farms.

In other countries, we find similar conclusions. For example, most dairy companies in Slovakia place conditions on farms to gain access to these offered programs, meaning that not all suppliers have equal access. Three out of six interviewed companies said that farms need to have a minimum size to qualify for investment support; one indicated that only the bigger and better quality suppliers were allowed to use the (forward) credit program; one only offers investment programs to “financially healthy” farms.

In Bulgaria, two domestic dairies indicate that they set a minimum size for farms to qualify for their programs. A third claims that small producers are not interested in investments and do not apply for support. Danone explicitly limits assistance programs to contracted suppliers. Meggle’s programs are limited to large suppliers by default since only farmers with large milk quantities can deliver to Meggle.

In Poland, we did not find such differential treatments and found that VC and increased quality requirements had positively affected the survival and growth of small dairy farms. Two hundred and eighty-three households in the sample delivered milk to dairy processing companies in 1995. Of these, only 36 (13%) stopped delivering milk between 1995 and 2000. Ten of them (4%) stopped producing altogether while the rest kept some cows for home consumption. Hence, 87% continued delivering to dairies despite radical restructuring of the dairies and tightened quality demands. (Moreover, some of those who stopped delivering might have stopped anyhow: the average age of those who stopped producing is 56 years, compared to 45 years for the entire sample.)

Often, supplier programs differ to address the characteristics of these varying farms. For example, in case studies of dairy processors in Moldova, Poland, and Romania, we find that 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 microrefrigeration units.

In the crop sector, Gow and Swinnen (2001) report how oilseed processors and brewing/malting companies in Central Europe (Hungary and Slovakia) used several different contract types to deal with different farms and regions. The contracts differed, reflecting differences in enforcement

problems and transaction costs. For example, several companies contracted directly with larger farms and with so-called integrators, who in turn contracted with smaller farms.

Studies from other regions show a similar mixed picture. While many reports indicate the general preference of companies to work with fewer and larger suppliers, there are many cases where companies actually contract with a mixture of large and small farms or even primarily or exclusively with a large group of small farms (e.g., Bivings and Runsten, 1992; Glover and Kusterer, 1990; Von Braun et al., 1989). Key and Runsten (1999) document how, even within the same industry, a variety of contractual models coexist with some companies contracting with large suppliers only, and others with both large and small suppliers, and yet others where the contracting has changed over time.⁵⁰

Furthermore, empirical evidence indicates that companies in reality work with surprisingly large numbers of suppliers and of surprisingly small size. Even studies pointing at challenges facing small farmers in evolving modern supply chains find that small and medium farmers can be successfully integrated in the chains, with processing and trading companies actively investing in institutions and infrastructure to reduce transaction costs, such as collection centers. Some examples are given here.

In a recent report on the impacts of the growth of modern retailing in Central America, Berdegúe et al. (2003) document that 70% of the suppliers for Hortifruti, a highly developed specialized retail FFV supplier in Costa Rica, are small farmers (who passed the selection process and benefited from extended supplier assistance), working via intermediate packers who aggregate supplies, and that this suppliers group has been very stable over the past 5 years. The same thing occurred in Nicaragua, an even poorer country, where the supply chain invested in a system of collection centers in rural areas to collect small and poor farmers' products.

Friesland Romania, a subsidiary of the Dutch FCDF group, entered the Romanian market in 2000, and 3 years later processed approximately 200–250 tons of milk per day, in five factories. The company has simple contracts with approximately 40,000 small farmers from whom it purchases milk through 1050 collecting points and from some 600 larger farms (Van Berkum, 2004). Friesland owns the collection points and has upgraded them by investing in cooling and inspection facilities.

50. The evidence in Key and Runsten (1999) on contracting in the Mexican vegetable industry indicates that most processing companies were contracting with small and large suppliers when the demand was high compared to the supply, and thus prices high, but that small suppliers were cut first when the market became less profitable. This suggests that as the processing companies come under pressure they tend to shift to larger growers and cutting off the small suppliers in a strategy to economize on transaction costs.

A recent study on VC in Chinese modern retail supply chains (Hu et al., 2004) also yields evidence on contracting with large numbers of small suppliers. They give the example of Beijing SanLu Vegetable Co. started contracting with farmers in 1999 for its Beijing supermarkets and for exports. It started with 300 farms in 1999, with average farm size of one-sixth of a hectare. By 2003, it was contracting with 4500 farms with an average size of one-third of a hectare. All the farms receive seeds, technical assistance, information on prices and market developments, and guaranteed prices for specific qualities. In addition, SanLu invested in collection centers in the main production sectors to reduce transaction costs.

Another example from this study is Xincheng, a food processing enterprise that produces packaged fresh vegetables for the Shanghai urban wet-markets. In 1997, Xincheng began to supply supermarkets and by 2003, it was supplying 500 supermarkets owned by domestic and foreign chains. Until 1998, Xincheng relied on the wholesale markets for raw materials, implying paying wholesale margins, inconsistent quality, and risk of food-safety problems. As of 1998, Xincheng shifted toward contracting supplies directly. It has contracts with 4200 individual farmers in the rural area near Shanghai. It supplies the farmers with seed, fertilizer, pesticide, and technical assistance. All their output, produced according to Xincheng quality and safety standards, is sold to Xincheng, and the cost of the inputs is deducted from the output price. Since 2000, Xincheng also rented 1000 hectares of land, built greenhouses on it, and hired 200–300 farmer migrants from poor areas inland to operate the farm, under similar contracts as the farmers, except for land.⁵¹ At this moment, Xincheng sources 15–20% of its vegetables from its own greenhouses and hired workers, and 50% from the 4200 outgrowers. The balance, 30%, is bought from wholesale markets.

Finally, our Kazak cotton study also yields evidence of processor contracting with thousands of small farms, many of whom receive prefinance and other inputs from the processors. To reduce the transaction costs, the gins have themselves invested in collection centers at various localities throughout the cotton-producing areas.

An alternative mechanism of overcoming transaction costs is using existing cooperatives as an instrument for reducing transaction costs. For example, in Poland, Danone has its own suppliers but also purchases milk from a Polish dairy cooperative, with many small suppliers, for further processing the milk into higher value products. Here, Danone makes use of the cooperative to reduce transaction costs in its dealings with small suppliers.

51. Xincheng has recently started a similar operation 500 km to the south, in order to have counter-season vegetables in Shanghai's winter.

Why Contracting with Small Farmers?

Hence, despite the apparent disadvantages noted earlier, the empirical evidence suggests that VC with small farmers is widespread. The question is why? There are several reasons.

First, the most straightforward reason is that companies have no choice. In some cases, small farmers represent the vast majority of the potential supply base. For example, over 95% of Romanian dairy “farms” have one to two cows. These farms have 83% of all milking cows in Romania. Only 0.25% of all farms with cows have 10 cows or more, with only 5% of the total herd of milking cows on these farms. Similarly, in countries such as Poland, much of the dairy supply is in very small farms. Hence, any dairy processor needs to deal with small farms by necessity, focusing, for example, on investments in collection points, etc. rather than on-farm equipment.

Van Berkum (2004) writes:

Although the larger farmers have some privileges in assistance programmes with respect to investment funds eligibility, there are no signs that the present vertical coordination arrangements in the Romanian dairy supply chain exclude small farmers. Despite high transaction costs dairies are willing to collect the milk from small plots, largely through collection points. The two foreign dairies interviewed in the survey explicitly indicated to like to reduce the number of small-scale suppliers and work with larger suppliers. Yet, the problem is that there are only very few dairy farms with more than 5 cows in Romania. For the moment, dairies have to accept this situation until restructuring and consolidation in the sector starts off. In the meantime, the larger dairies are keen to assist their supplying farmers in improving their conditions for producing higher quality milk by providing advice, improving access to inputs including investment means and enhancing access to output markets. Farmers who are willing to learn and develop get chances to further develop their business.

Second, our case studies suggest also that company preferences for contracting with large farms are not as obvious as one may think. While processors may prefer to deal with large farms because of lower transaction costs in, e.g., collection and administration, contract enforcement may be more problematic, and hence costly, with larger farms. In several interviews company managers indicated that (smaller) family farms were less likely to breach contracts or to divert company investments than large cooperatives or farming companies. White and Gorton (2004) also conclude in their study that processors repeated emphasized that farms’ “willingness to learn, take on board advice, and a professional attitude were more important than size in establishing fruitful farm-processor relationships.”

Third, in some cases small farms may have substantive cost advantages. This is particularly the case in labor-intensive, high-maintenance, production activities with relatively small economies of scale. For exam-

ple, Key and Runsten (1999) present evidence that small farmers' production costs in Mexican vegetable contract production were 45% lower than that of specialized farms owned by the processing companies. Costs were lower primarily because of imperfections in labor and land markets. Small farmers had significantly lower labor costs because of access to unremunerated family labor for which markets are missing, and much lower costs of supervising, transporting, and recruiting labor input; and because they did not pay any government benefits. Land rents were lower because of restrictions in land markets constraining formal renting by large farms. And also pest control costs were lower due to better crop monitoring and thereby lower chemical use. Further, small farmers' yields in vegetable production were 20% higher than on the firm's own farms.

Fourth, processors may prefer a mix of suppliers in order not to become too dependent on a few large suppliers. For example, Caudron et al. describe the difficulties of retailer Metro in Morocco in contracting with modern large shippers. Metro caters for hotels in tourist areas and other high-standard food outlets and requires high product quality and packaging. Metro has contracted informally with "Domaine Douiet," one of the very few Moroccan FFV exporters. Douiet has committed to provide Metro with fixed volumes of high-standard FFV (such as cherry tomatoes sold in a transparent plastic box). However, Metro has not been successful in enforcing full compliance with the terms of contract and faced several shortages of produce, in particular in periods of high export prices when the supplier found it more profitable to export. As a consequence, these retailers have started to contract with groups of smaller growers and in some cases, when those groups did not exist, to stimulate their creation.

Fifth, processing companies differ in their willingness to work with small farms. Evidence indicates that some processing companies work with small suppliers even if others do not—this may reflect the processing companies' own roots as cooperative organizations.

For example, in the Romanian dairy sector, Friesland, and especially ISPA and Raraul seem to be more inclined to work with small farms than Danone, reflected in the way they assist small suppliers and invest in overcoming transaction costs (see Table A3.1). All of them contract many small-scale holdings and most of them also contract large-scale farmers. Friesland and Danone have outsourced the transportation of milk to independent conveyors but Friesland has invested significantly in collection centers. Raraul and Promilch/ISPA take care of the collection and transport themselves.

ISPA, a dairy association, takes further initiatives to provide its members with basic farm-level support on matters of key importance (feeding, milk quality, and hygiene) and a secure market outlet. Furthermore,

TABLE A3.1. Contracts partners and arrangements for collection and transport

Arrangement	Danone	Friesland	Promilch/ISPA	Raraul
Contracting small farmers	X	X	X	X
Contracting large farmers	X	X		X
Owning collection centres		X	X	X
Arranging transport to farm-collection centre			X	X
Arranging transport to collection centre—dairy			X	X

Note: X means “yes” or “applicable to.”

Source: van Berkum.

by investing in further processing, this association adds further value to raw milk and strengthens the market position of its members. This example shows that small-scale farmers may have future perspectives when effectively organised.

Key and Runsten (1999) also find that small farm inclusion may depend on company strategies in Latin America. They also document how some processing companies in the Mexican vegetable industry continue to work with small local suppliers even when others do not (any more). These companies continue to work with small farms because they have been able to design and enforce contracts that both the small firms and the companies find beneficial. The firm benefits from the low-cost production on small farms, significantly lower than on large farms, while providing inputs, assistance, and credit in a way that minimizes the firms’ transaction costs. The latter is done by providing credit without collateral; by restricting the number and the location of the farms (farms have to be located along roads where they are easily accessible for company agronomists) and by demanding that farms come to the company to pick up seeds and fertilizer and to deliver the harvest.

That said, even companies willing to invest in upgrading small farms only go so far, and tend to have a strategy in the long run to upgrade part of their supply here to larger, more efficient, and fewer suppliers. Yet, in countries like Poland, Romania, and many CIS countries dominated by household dairy production, “large” is a relative concept. As Van Berkum (2004) puts it: “In Romania, large farms are farms with more than five cows.”



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