

Unclassified

TAD/CA/APM/WP(2010)10

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

26-Apr-2010

English - Or. English

TRADE AND AGRICULTURE DIRECTORATE
COMMITTEE FOR AGRICULTURE

Cancels & replaces the same document of 23 April 2010

Working Party on Agricultural Policies and Markets

TRANSFORMATION OF FOOD PRODUCTION AND DISTRIBUTION SYSTEMS: DRAFT REPORT

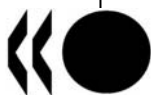
17-20 May 2010

This document is submitted to the 51st Session of the Working Party on Agricultural Policies and Markets for DISCUSSION under item 9b of the draft agenda.

Contact person: Linda Fulponi (e-mail: linda.fulponi@oecd.org)

JT03282416

Document complet disponible sur OLIS dans son format d'origine
Complete document available on OLIS in its original format



TAD/CA/APM/WP(2010)10
Unclassified

English - Or. English

(Note by the Secretariat)

This report, prepared by Professor Jo Swinnen and Kristine van Herck of Leuven University, synthesizes the evolution of the agro-food system over the past several decades. It describes the key changes and drivers of the evolution in the processing and retailing sectors that constitute main actors of modern food supply chains. In particular, it reviews studies undertaken on this transformation with a focus on the transition experiences of the farm sectors of Eastern European countries as well as in a number of developing countries in Asia and Latin America. The evidence on the impacts of this transformation for small farmers is examined and the authors find that it has brought numerous direct and indirect benefits to these p producers. This report is part of the project on structural adjustment in agricultural commodity markets under the 2009-10 PWB of the COAG under Output Area 3.2.2. It was scoped in a note presented at the APM meeting in October, 2009 [TAD/CA/APM/WP(2009)19]. It is submitted for information and discussion.

TABLE OF CONTENTS

TRANSFORMATION OF FOOD PRODUCTION AND DISTRIBUTION SYSTEMS	4
Executive summary	4
1. Introduction	6
2. Transformation of the agro-food industry	6
3. Concentration and market power	8
4. The restructuring of the procurement system.....	9
4. Implications of transformation for primary producers	12
5. Concluding observations	16
REFERENCES	19
TABLES	25
FIGURES.....	32

TRANSFORMATION OF FOOD PRODUCTION AND DISTRIBUTION SYSTEMS

Executive summary

1. Over the past two decades the agro-food industry has undergone major changes in structure and behaviour and more are likely as the sector becomes more globalised, interconnected and interdependent. Advances in information technology, biotechnology and changing consumer demands as well as shifts in market structure will continue to shape the future of the food economy. The concentration and consolidation underway in the sector reflects the experience of non-food sectors, where foreign direct investment, technology, global competition and new financial arrangements have redesigned the economic environment and incentive structure. The transformation has been happening at both the national level and in international markets. This report provides an overview of the recent empirical literature on this subject, with a special focus on selected transition and developing countries where the changes have been most rapid and profound.

2. Changing lifestyles, demographics and rising incomes as well as education levels have brought an increase in consumer demands for quality, safety and variety as well as value. More recently, the demand for sustainably produced products is increasing because of growing concerns about climate change and biodiversity. The retail sector responds by offering new products and passes on new product specifications to their suppliers, whether these are manufacturers or agricultural producers.

3. A key change in the food economy over the past decade has been the growing concentration in the retail sector in almost all OECD, and even non-OECD, economies. Concentration of the retail sector is more than a national chain phenomenon as multinational retailer groups are investing across the globe, from Europe to Latin America and Asia. With greater control of domestic retail markets and strengthening international positions, retail groups are becoming the dominate player in the agro-food system, able both to wield bargaining power and to extract beneficial trading terms from suppliers. This development has influenced procurement markets, by changing both the scope and form of market power.

4. The transformation of the industry provides both opportunities and risks for suppliers. While impacts of the transformation on the larger and more mature OECD farm producers may be limited and marginal, in other less advanced countries, such as in transition and developing countries, the impacts appear to be more significant. In these countries, the food systems are expanding, modernizing and reorganizing all at the same time, bringing significant challenges to all players.

5. Those producers who are able to comply with the more stringent quality requirements as well as any minimum requirements for production scale will benefit from access to modern supply chains (*i.e.* primarily contract farming and vertical coordination) with more stable markets and incentives for investments and expansion. Thus a modernized food system can provide medium and long economic growth opportunities. Those who do not have the capacity to meet growing demands due to a lack of financial and physical capital or technical skills, risk exclusion from mainstream agro-food sector and the associated economic benefits.

6. The welfare and income effects of this global transformation for smallholders in emerging and transition economies have been overall quite positive. This is the case for both those included in the modern supply chains but also for those who are not as these benefit from spillover effects, such as increased demand for labour, farm and non-farm and for other goods and services. Downstream firms often introduce vertically coordinated farm assistance programs to address small farmers' constraints regarding credit and technical assistance, providing means to integrate these farmers into the supply chain. Being integrated into the supply chain means, in most cases, higher productivity, output and income, access to new technologies and innovations to upgrade quality. This process can also reduce gender inequality; contribute to reduce farmers' health risks and improving the environment.

7. Governments, particularly in transition and development countries, can take action to stimulate the participation of small and poor farmers in modern supply chains. Governments can help reduce the transaction costs of dealing with small farms, enhance competition in the sector and facilitate small farm bargaining power. Effective approaches have involved investment in rural infrastructure, provision of supplier assistance programs and development of well functioning markets.

1. Introduction

8. The transformation of food production and distribution systems has emerged as an issue of global importance. Structural change in the production and distribution food system raises a number of questions for adjustment opportunities or strategies of individual producers as well as having impacts on commodity markets. What have been the main drivers of the transformation downstream? How are these being transmitted upstream; that is, what are the economic mechanisms employed? What impacts might these have on the behaviour of supply, demand and price in commodity markets? Has there been a change in capital, labour and land use on farms? Which producers have been successful in adapting to changes and what were the key factors determining their success? How were the outcomes conditioned by the initial configurations of land, labour, technology and access to finance? How has the transformation of these systems affected quality, productivity, investment and incomes of farms?

9. To better understand the dynamics and effects of the downstream sector on producers and sector performance in terms of supply, demand and prices overall, this report reviews a rapidly growing body of empirical research at the sector and farm level. This review includes a large set of case studies and original survey work from transition and developing countries where the pace of change has generally been the most rapid and profound, among other countries, Poland, Hungary, Russia, Slovenia, Slovakia, Albania, Romania, Kazakhstan, China and India. These surveys include information on farms, agri-business and rural households to get a broad view of the drivers of change and the resulting impacts.

10. Finally, the report offers some concluding observations, on modern supply chains (i.e. primarily the impacts of contracting and vertical coordination) based on the experiences of these transition and developing countries, on the process of adapting to new demands by the agro-food industry, as well how changes in regulation in food systems (e.g. changes in food safety and quality standards) affect production and trading systems both domestically and internationally.

2. Transformation of the agro-food industry

Stages in the transformation of the agro-food industry

11. The transformation of the agro-food industry, which includes processing, wholesale, and retail, has taken place in two stages over the past 40 years in the transition and developing countries. The first stage, “pre-liberalization/pre-globalization,” took place mainly in the period before 1980s-1990s. It involved public sector governed food system transformation. This was most extreme in the Communist system where the government managed all stages of the food production and distribution system (Rozelle and Swinnen, 2004). However, also in other regions, the government played an important role in the supply chain. For example, in Africa, the governments invested in parastatal organizations that provided both inputs to the farmers and purchased their outputs. In general, the period was characterized by government investment in the “modernization” of the food supply chain, to shift from a traditional small-scale informal agro-food industry, to a large-scale formal sector; examples include government investment in municipal wholesale markets and state-run retail chains.

12. The second stage, “liberalization/globalization,” started in the 1990s and continues today. This stage has seen food trade double, induced by trade liberalization and improvements in logistics. In addition, liberalization of food processing and foreign direct investment (FDI) in the retail sector spurred massive FDI and competitive domestic investments. In Eastern Europe, for example, FDI in the food and beverage industry, doubled in the period 2003-2007 (Figure 1). In combination with socioeconomic factors, such as income increases and urbanization, the private investments in the sector and later also the consolidation of the processing and retail sector spurred a “supermarket revolution” and transformation of the sector.

Phases in the transformation of the agro-food industry in transition and developing economies

13. Super-imposed on those two stages, there exist three “broad phases” of agro-food industry transformation, with the timing dependent on the region: (1) transformation of the wholesale industry, mainly in the 1960s to early 1990s; (2) transformation of the processing industry, mainly in the 1970s through the 1990s; and (3) transformation of the retail industry, mainly in the 1990s and 2000s.

14. The restructuring of each industry segment was driven by three similar sets of determinants (Reardon *et al.* 2009): (1) policy interventions such as public investments, market liberalization, trade liberalization and FDI liberalization; (2) demand side factors such as urbanization, rising incomes, and reduction in consumers’ transaction costs due to more refrigerators, roads, and vehicles; and (3) FDI and competitive domestic investments fueled by agro-food industry entrepreneurs seeking economies of scale, scope, and specialization.

Wholesale sector

15. The transformation in the wholesale sector generally took place in three stages. First, in the 1970s-1980s, increased investment in diffusion and upgrading of wholesale markets and market information systems led to a rapid spread of public wholesale markets, mainly in Latin America and Asia (excluding China). These investments were important to reduce transaction costs for small farmers to gain access to growing urban markets and to integrate markets to decrease price and supply volatility for urban consumers (Abbott, 1967). Second, in the 1990s–2000s, wholesale markets became more deregulated to allow greater entry and competition. Examples include Fafchamps *et al.* (2006) for India, Natawidjaja *et al.* (2007) for Indonesia, Koc *et al.* (2007) for Turkey, and Reardon *et al.* (2007) for Mexico.

16. Finally, in the 2000s, the restructuring of the wholesale sector continued through (1) increasing consolidation in certain markets, both in rural wholesale (for vegetables in West Java, Indonesia, see Natawidjaja *et al.*, 2007), within urban wholesale markets (for fruit in Mexico, see Reardon *et al.*, 2007), and over wholesale markets (for vegetables in China, see Huang *et al.*, 2007); (2) multinationalisation of wholesale and logistics, moving into new countries or provinces as “follow sourcing” for their modern retail clients (Reardon *et al.*, 2007); and (3) the emergence of “specialized and dedicated wholesalers” specialized in a certain product categories who used vertical coordination to ensure that supply met the requirements of the food industry clients further downstream (Reardon and Berdegué, 2002).

Processing sector

17. Similar to the wholesale sector, transformation of the processing sector can be described in three stages. First, in the 1970s –1980s, the government had some control over the processing sector. This was of course standard in planned economies, but also a characteristic of most developing countries, where there was substantial government intervention (e.g. African parastatal processors). Second, in the 1980s and especially the 1990s, the processing sector was liberalized and privatized, followed by rapid product differentiation and proliferation of private small and medium-sized processing companies. That proliferation was encouraged by a massive increase in the consumption of processed foods spurred by rising incomes, urbanization, and concomitant increases in the opportunity cost of women’s time in the 1990s, for example in Asia (Pingali, 2006).

18. In the second half of the 1990s and 2000s, the restructuring of the domestic processing sector continued (Wilkinson, 2004), showing: (1) rapid consolidation in specific product markets, with many mergers and acquisitions of small and medium companies; (2) multinationalization under massive inflows of FDI in the 1990s and 2000s; and (3) specialization among the surviving smaller niche processors. These trends are illustrated for the sugar sector in Slovakia (Gow and Swinnen, 1998), the dairy sector in Poland

(Dries and Swinnen, 2004), the dairy sector in Brazil and Argentina (Farina and Reardon, 2000; Gutman, 2002), and the general food processing sector in India (Bhavani *et al.* 2006).

Retail Sector

19. The most recent wave, and maybe even the most important one, is the transformation of the retail sector, which has two main stages. First, in the 1970s-1980s, some national governments invested in state-run retail chains, such as in China, India, Russia, Mexico and Zambia (e.g., Jha, 1992; Reardon *et al.* 2009). Second, in the mid 1990s and early 2000s, there was rapid development of the diffusion of supermarkets. This retail development was driven by large amounts of FDI (spurred by the liberalization of retail FDI in many countries in the 1990s) and competitive domestic private investment, by privatization of retail parastatals, by trade liberalization, by rising incomes and urbanization, and by procurement system changes (discussed below). The spread of modern retail supermarkets occurred earliest in South America, East Asia (excluding China), and North-Central Europe and South Africa; then in Central America and Mexico, Southeast Asia, and South-Central Europe; and finally, and most rapidly, in China, India, Russia, Vietnam, and is now emerging in Southern/Eastern Africa. In the transition countries, the emergence and spread of modern supply chains was found to be closely and positively related to the reform process because of the need to secure property rights, macro-economic stability and contract enforcement (Figure 2) (Dries *et al.*, 2004).

20. The importance of the modern retail sector (hypermarkets, supermarkets, discount stores) rapidly increased. Figure 3 presents the recent growth of modern retail sector in Romania. In 2003 only 19% of the food purchases happened through modern supply chains, while in 2007 this percentage increased to 55%. In the Czech Republic, Slovakia and Croatia, the importance of modern supply chains also rapidly increased (Figure 4). Table 1 shows that the average market share of modern retail in Eastern Europe went from 40% to 49% in first wave countries from 1999 to 2002; in the second wave countries the share jumped from 9 to 24% over the same period, and from negligible to 1-2% in third wave countries.

21. In Asia, there was also massive growth of the the retail sector. In China, there was only one supermarket in 1990, while by 2002, there were 53 000 supermarkets and convenience stores (Table 2) (Hu *et al.*, 2004). In Thailand, annual growth in the number of modern food outlets was 11% in 2001 and 2002 (USDA, 2002). In the Philippines, the number of supermarkets has increased from 496 in 1994 to 3989 in 2001, a 30% annual growth (Digal and Concepcion, 2004). Indonesia has seen the number of supermarkets and hypermarkets grow from 237 in 1989 to 1400 in 2002 (Chowdhury *et al.*, 2004). Overall, modern retail sales increased significantly in almost all transition and developing countries (Table 3).

3. Concentration and market power

22. In the literature, it is generally acknowledged that consolidation is taking place in the food industry, in high income and emerging economies. Most of this process is through mergers and acquisitions, and it applies both to food processing and retail companies (Dobson *et al.*, 2003; McCorrison, 2006; Messinger and Narasimhan, 1995). Large food companies are also increasingly going global through foreign direct investments, thereby increasing concentration outside their home markets (Clarke *et al.*, 2002). However, the empirical evidence on the extent of consolidation is less straightforward.

23. For example, the data reveal little concentration in food manufacturing at the global level for packaged food sales. The top fifty food manufacturers have a combined market share of less than 20% in global packaged food retail sales (Gehlhar, 2008). However, high concentration rates do occur for some specific products or in specific regional markets. This is largely driven by a few big multinational food manufacturers, such as Unilever, Nestle, and Danone who are selling products that exhibit pronounced

brand loyalty and are market leaders in many countries (Dobson *et al.* 2001). As Gehlhar (2008) reports, food manufacturers tend to strategically focus on specific product lines “where they have inherent advantages”.

24. The concentration and market power of the retail sector is a relatively recent phenomenon. In fact, until the 1970s, even in the US and Europe, the food retailing sector was largely fragmented compared to the food manufacturing sector. For example, Sexton and Lavoie (2001) cite a summary report of the US National Commission on Food Marketing (1966) which argued that especially in grocery manufacturing, concentration had reached “undesirable high levels”. Meanwhile, Dobson and Waterson (1997) mention that in 1961, the leading five firms controlled only 8-9% of national retail goods sales in the UK. This rose to 14% in 1982, and to 22% in 1992. Concentration has since increased. In the US, the combined market share of the four largest grocery retailers increased dramatically over the past two decades: from 14% in 1984 over 22% in 1994 to 55% in 2001 (Brunn, 2006; Kinsey, 1998). Clarke *et al.* (2002) report that by the mid 1990s, food retail concentration in the EU had become considerably higher than in the food manufacturing industry: the 20 largest firms account for 40 % of the aggregate retail food turnover in the EU, while the corresponding figure for the food manufacturing sector was only 15%. At the end of the 1990s, the average five-firm concentration ratio in the grocery retailing sector was close to 50% in the EU-15, but with substantial variation among EU member states. For food retail in general, Germany, the UK and Hungary have relatively high concentration ratios, with market shares held by the largest five food retailers (*i.e.* the C-5 concentration ratios) at a level of over 70% in 2006 (London Economics, 2008). More recent figures by Einarsson (2007) show that the grocery market is even more concentrated in northern Europe: the three-firm concentration ratios for 2004 are Denmark (91.2 %), Finland (79.6%), Iceland (81%), Norway (82%) and Sweden (91.2%). For Eastern Europe, Dries *et al.* (2004) provide evidence of consolidation in the retail sector and indicate that it has been mainly multinational retailers that have invested in the region.

25. The growth of global food chains has increased market opportunities for farmers in transition and developing countries. Moreover, in the presence of market imperfections and contract enforcement problems, efficiency premiums in vertically coordinated contract arrangements may provide additional benefits for farmers. Increased competition is likely to benefit farms by improving contract conditions, but may incite additional costs as contract enforcement becomes more complicated (Swinnen and Vandeplass, 2009). For example, empirical evidence on contracting 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 (Swinnen *et al.* 2007). In Kazakhstan and Kyrgyzstan, the cotton chain is characterized by strong competition among private gins buying cotton seeds from small farms for processing, with much better conditions for farmers. In contrast, Poulton *et al.* (2004) conclude that in the African cotton supply chain strong competition has led to contract breakdowns. The only places where studies have found farmers to be consistently exploited is in monopolized systems, such as in Uzbekistan, Tajikistan (and Turkmenistan).

4. The restructuring of the procurement system

26. The transformation of the agro-food industry induced major changes in the product procurement systems of the retail sector. Modern procurement systems have fundamentally changed the market facing farmers.

27. Procurement system modernization includes (Reardon & Berdegué, 2002) two important elements: (1) a shift from no standards or public standards to private standards for quality and safety; and (2) a shift from spot markets relations in traditional wholesale markets to vertical coordination mechanisms.

Shift toward increasing private standards

28. Generally, growing demand for high standards is a natural consequence of income growth. In recent years it has been reinforced by several additional events. For example, international campaigns on societal concerns (child labour, animal rights), NGO activities expressing growing concerns about climate change and the loss of biodiversity and several food safety issues (dioxin, BSE, FMD, malathion) have all contributed to a rising demand for high quality, safe, sustainable and traceable products in the production chains of many nations (Xiang *et al.* 2009). These changes in consumer demands have resulted in an increase of food standards (Figure 5).

29. The demand for higher food standards has changed the way of doing business along the food chain (Kinsey, 2003). Food standards are no longer only introduced and regulated by the government, but also by processing and retailing companies, who develop their own private corporate standards (Swinnen and Vandemoortele, 2008). Fulponi (2007) illustrates the importance of private corporate standards based on a survey of 16 leading food retailers. About 90% of retailers reported that the standards they required for doing business were higher than those set by the public authorities, and about one-half reported that they were significantly higher (Figure 6).

30. Although high standards emerged initially in more advanced countries, they affect the transition and developing countries through several channels. Standards are imposed on imports from transition and developing countries and hence on the production practices in the exporting countries (Jaffee and Henson, 2004; Unnevehr, 2000). Trade liberalization in the transition and developing countries led to an increase in the participation of these countries in world agricultural trade. In addition to an increasing volume of global agricultural trade, the structure of this trade also changed considerably during the past decades. There has been an increase in the share of high-value products – mainly fish and fish products, and fruits and vegetables – in world agricultural trade (Table 4). Especially in developing countries, high-value exports increased while the importance of traditional export commodities – such as coffee, cocoa, and tea – has decreased (Aksoy, 2005).

31. The liberalization of investment regimes attracted foreign investment in the agri-food industry. An example is the rapid growth of modern retail chains (“supermarkets”) in transition and developing countries (Reardon and Swinnen, 2004). These modern retailing companies have begun to set standards for food quality and safety in the sector wherever they are doing business (Dolan and Humphrey, 2000; Henson *et al.*, 2000). This rising foreign investment in processing and retailing in developing countries introduced new and higher food standards, as buyers are making new demands on local producers in order to serve the high-end income consumers or to minimize transaction costs in supply chains (Reardon *et al.*, 2003a).

Shift towards vertical coordination mechanisms

32. Until twenty years ago, vertical coordination of food supply chains was widespread in transition and developing countries. This was most extreme in the socialist countries where all stages in the food production and distribution were coordinated and determined by the central command system (Rozelle and Swinnen, 2004). The state also played an important role in food supply chains in developing countries (e.g. African parastatal organizations).

33. In the 1980s and 1990s, countries in the transition region, liberalized input and output markets and privatized farms and processing companies, which caused vertical coordination along the supply chain to collapse. In many developing countries, privatization and market liberalization led to the decline of input and credit supply to farms as it dissolved the services previously provided by various government-

controlled agricultural institutions, cooperative unions and parastatal processing companies without first ensuring a replacement private sector infrastructure was in place.

34. As a result of the privatization of the food supply chain, processing companies faced a lack of quality supplies for several reasons. Farms may not be willing to supply their output to the processor because they fear not being paid once they deliver the product (Gow and Swinnen, 1998). Farms may not be able to supply because they cannot access basic production factors (feed, fertilizer, seeds, capital, etc.). Farms may only supply poor quality products because: (a) they lack the necessary inputs to improve the quality; and (b) they lack expertise and know-how for producing high quality.

35. A strategy to address these problems typically involved some form of vertical coordination. 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 input supply programs, investment assistance programs, trade credit, bank loan guarantee programs, extension and management advisory services. Fees for these assistance programs are typically deducted at time of delivery. Enforcement of the payments is controlled by effectively linking output and input markets - assistance programs are restricted to farms supplying to the company and part of an (implicit) contract between the farm and the company.

36. Over the past ten years, the importance of vertical coordination of the supply chain has been rapidly increasing in the transition and developing countries. In the Czech Republic, Slovakia and Hungary, 80% of the corporate farms, who dominate production in these countries, sold crops on contract, and 60-85% sold animal products on contract. These shares are considerably higher than in the US.¹ Besides offering a guaranteed market to farmers in transition and developing countries, these contracts often also include farm assistance programs. In surveys of dairy processors in several Eastern European countries, Dries *et al.* (2009) and Swinnen (2005) find that most processors offer at least one type of farm assistance programs and many of them offer multiple types (Table 5).

37. Further east in the transition region, a survey of agro-food processors in five CIS countries (Armenia, Georgia, Moldova, Ukraine and Russia) found that food companies which used contracts with suppliers grew from slightly more than one-third in 1997 to almost three-quarters by 2003 (Gorton and White, 2007). The food processors in the sample indicated that they offer substantial farm assistance programs to their farmers (Table 6). The most important programs are prompt payments (47% of the processors offer this program), transport (45%) and credit provision (39%). Similar findings hold for the cotton sector in Kazakhstan, where Swinnen *et al.* (2007) found that 89% of the contracting farmers receive credit from the processor (Figure 7).

38. In South and Southeast Asia, there has been a sharp increase in contract farming during the past 20 years (Gulati *et al.*, 2007). Typical contract farming commodities are poultry (broilers in particular), dairy and high quality fruit and vegetable production. In Thailand, for example, virtually all commercial produced broilers are produced under contract, whereas the corresponding figure for the Philippines is 80% (Delgado *et al.*, 2003).

39. Finally, in Latin-America, vertical coordination is widespread over many different agricultural commodities and includes various contractual arrangements ranging from purely marketing contracts to production contracts with provision of inputs, credit, technical assistance and marketing assistance (Dirven, 1996) (Table 7).

¹ At the end of the 1990s, 31% of the crop production and 56% of the animal production were produced under contracts in the US (Swinnen, 2007).

4. Implications of transformation for primary producers

40. In the past ten years, many studies have analyzed the dynamics and effects of the downstream sector on producers and thus sector performance in terms of supply, demand and prices based on case studies and original survey work. In this section, we review empirical evidence from case studies and surveys on the impact of the transformation of the agro-food industry in transition and developing countries. We distinguish between effects on production (efficiency) and effects on welfare (equity).

Efficiency effects

41. The impact of modern supply chains has emerged through various channels, including horizontal (or cross company) spillover effects and vertical (or household and farm) spillover effects. Horizontal spillovers emerged when domestic companies started copying management innovations from international companies, such as farm assistance programs, which increased the availability of such programs for suppliers dealing with these companies (Dries and Swinnen, 2004; Gorton and White, 2007; Dries *et al.*, 2004). Vertical (or household/farm) spillovers occur through both direct and indirect effects. Directly, the change in procurement systems and the introduction of farm assistance programs improved farmer access to credit and inputs, which had a positive impact on productivity, quality and farm investments.

42. Indirectly, contracting reduce production and marketing risks. Processing firms involved in modern supply chains reduce the production risk by providing their farmers of the necessary inputs, working capital and technical assistance. By linking input and output markets, the marketing risk of farmers is reduced since the processing firms provide a guaranteed output market, often at guaranteed prices. Reduced production and marketing risks improves stability of a farm income, which is an important benefit for producers operating in high risk environments and in the absence of insurance markets.

43. A number of studies provide evidence that risk reduction is important for farmers engaged in modern supply chains. There is a study on India in which Birthal *et al.* (2005) find that for milk, broilers and fresh fruits and vegetables, farm profits of contract farmers are higher through lower production and marketing costs for contract farms compared with independent smallholders (Table 8). Also in South Asia, Herath and Weersink (2009) found that the production costs of Indian tea producers significantly decreased after the introduction of modern supply chains. Finally, there are a series of studies that show that guaranteed market access (to output and input markets) and guaranteed prices are the most important motives to engage in contract farming. For example, survey results from the Czech Republic, Slovakia and Hungary, indicate that, at the end of 1990s, the main motivations for farms to contract were guaranteed sales and - although to a lesser extent - guaranteed prices (Table 9).

Impact on output and productivity

44. As noted above, farmers have benefited through effects on output and productivity of the commodity under contract through better access to inputs, timely payments, and investment support. Case studies of the sugar and dairy sector in East Europe show how contracts and farm assistance programs resulted in dramatic increases in output and yield (Gow *et al.* 2000; Dries and Swinnen, 2004). For example, in Slovakia the introduction of contracts caused sugar yields to increase from 32.5 ton/ha with 14 % sugar content in 1992 to an estimated 45 ton/ha with 16.5 % sugar in 1997 (Gow *et al.*, 2000).

45. Similar findings result from a survey of CIS agri-business enterprise executives by White and Gorton (2007) in five CIS countries (Armenia, Georgia, Moldova, Russia and Ukraine). In this study, processors were asked to estimate the impact on agricultural yields and product quality for each of the contract support measures that they had introduced. The mean impact for each contract support measure was an increase of 9.1% in yield. The measures with the greatest impact on yields were specialist storage

(especially cooling equipment in the dairy sector), veterinary support and physical inputs (Table 6). Market measures such as prompt payments, guaranteed prices, and market access also had large positive effects.

46. In India, FAO reported on a project in which a company provided contracts to 400 farmers in northern India to grow selected varieties of tomatoes for paste. They found that yields of contracted farmers were 64% higher than those that produce for the spot market (FAO, 2001).

47. In addition to the beneficial effects on output and productivity of the commodity under contract, there are potential spillover effects on other commodities. Receiving farm assistance programs, such as extension services, for one commodity can lead to better management techniques and better input use for all produced commodities, including the ones not under contract. An example of this is provided by Minten *et al.* (2009) based on a case study of fruit and vegetable production in Madagascar. One company that exports fruit and vegetables to five retail chains in the EU contracts with almost 10,000 very small farmers in order to have sufficient supplies. Minten *et al.* (2009) found for this case of contracting, that in addition to the positive welfare effects, there were also significant effects on improved technology adoption, better resource management and spillovers on the productivity of the staple crop rice.

Impact on quality

48. The emergence of modern supply chains has also led to substantial improvements in the quality of the output as processing and retail companies are demanding high quality products. Evidence of these changes in quality can be found in the Eastern European dairy sector (Dries *et al.*, 2009). Figure 8 shows how milk quality rose rapidly following the transformation of the milk supply chain in Poland in the mid 1990s, in Bulgaria at the end of the 1990s and in Russia in 2000. In Poland, the share of the market held by the highest quality milk producers increased from less than 30% on average in 1996 to around 80% on average in 2001. In Bulgaria, the share of highest quality producers increased from 17% on average in 1997 to 34% in 2003 and the share of the lowest quality milk decreased from 20% in 1997 to 10% in 2003. In the Russian Campina factory, the share of the highest quality milk producers increased from 6% in 2000 to 55% in 2004, while market share of the lowest quality producers fell from 37% to less than 10% over the same period.

Impact on investments and household wealth

49. The transformation of the supply chain has had a positive effect on farm investments. Loans provided by the processing companies and loan guarantee programs have significantly increased farmer access to credit and facilitated farm investment. In Poland, more than three quarters (76%) of all surveyed dairy farmers made investments in the years after the transformation of the supply chain, including many small farmers of less than 10 cows (Dries and Swinnen, 2004). There are several farm assistance programs that stimulate investments, including loans provided by the dairy companies to make dairy specific investments. In Poland, dairy farmers used such loans from to invest in enlarging and upgrading the livestock herd (30%) and cooling tanks (56%). There is also assistance to farmers in the form of bank loan guarantees assistance in accessing inputs (mainly feed) by directly lowering input costs or by reducing the transaction costs in accessing inputs.

50. Improvement of a farmer's cash flow and access to capital also benefits investments in other farm and non-farm activities, because it reduces financial constraints, especially in the presence of capital market imperfections. Other farm assistance programs, such as extension services, can lead to productivity spillovers on other crops for example through better management techniques and better input use.

Welfare and distributional effects

While there is a consensus in the literature that the emergence and spread of modern food supply chains is profoundly changing the way food is produced and traded in transition and developing countries, with important positive implications for the production, there is still debate on the welfare implications. There are four potential welfare concerns with vertical coordination, namely the distribution of rents in the supply chain, the exclusion of smallholders and poor farmers from modern supply chains, gender related issues and health concerns.

Rent distribution in the food supply chain

51. Due to the introduction of modern supply chains, farmers have better access to credit, inputs and markets due to the introduction of linked contracts while processors have better access to sufficient quantities of high quality products. This implies that productivity and income increases for the supply chain as a whole. However, a key question examined in the literature is. who benefits from this increase in efficiency and total income and more specifically; do farmers receive a fair share of these rents?

52. If the processing firm or retail company can set the terms of the contract such that it captures most or all of the rents, the productivity growth may not benefit farmers; and contracting may even bestow additional monopoly power upon the processing company. In this perspective, contract-farming has often been criticized as being a tool for agro-industrial firms and food multinationals to exploit unequal power relationships with farmers and extract rents from the chain (Warning and Key, 2002). In a study on Kenya, Minot and Ngigi (2004) demonstrated that modern marketing chains put intense pressure on smallholders (although smallholders were still participating). Even more extreme, in the case of Côte d'Ivoire, almost all of the fruit and vegetables being produced for exports were being cultivated on large industrial estates owned by wealthy industrialists. However, the empirical results from the studies covered in this literature review suggest that farmers often benefit in many ways from contract farming and vertical coordination (e.g. Dries and Swinnen, 2004; BIRTHAL *et al.*, 2005; Gulati *et al.*, 2007; Herath and Weersink, 2009; Minten *et al.*, 2009; Maertens *et al.* 2008).

Participation and exclusion of smallholders

53. A key concern in the debate on the welfare implications is that the emergence and rapid spread of modern supply chains in transition and developing countries will push a large share of farmers and in particular poor, small farmers, out of the market as retailers and food-processing companies prefer to contract with larger and wealthier farmers. This can potentially affect the way income is distributed within the rural economy and can exacerbate existing patterns of economic stratification (Warning and Key, 2002). Small farmers are most vulnerable because there is an important fixed transaction cost component in exchanges between farms and retailers, making it less desirable for retailers to deal with many small farmers than with a few larger suppliers. Also, a certain level of new investment is often needed to meet contract requirements and small farms are more constrained financially, either because they do not have sufficient personal resources or because they have problems accessing external funds in imperfect rural financial markets.

54. However, in many cases food processors have little choice but to work with smaller producers. While in most developed countries production is dominated by larger farm operations, in many developing countries small farms represent the major share of the potential supply base. In such cases, retailers and food processors have successfully integrated these small operations into the supply chain This is the case, for example, in the dairy sector in Poland and Romania, and in many other sectors in Eastern European countries (Swinnen, 2005).

55. Case studies from transition countries suggest 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, contract enforcement may be more problematic, and hence costly, with larger farms. Processors repeatedly emphasized that a farmers' "willingness to learn, take on board advise, and professional attitude are more important than size in establishing fruitful farm-processor relationships". In some instances, small farms may have substantive cost advantages. This is particularly the case in labour intensive, high maintenance, production activities with relatively small economies of scale. Finally, processors may prefer a mix of suppliers rather than depend too heavily on a few large suppliers.

56. The empirical evidence on exclusion of poor, small farmers and the welfare effects is mixed. In the early literature, there were several studies that confirmed the prediction that small and poor farmers are systematically excluded from the supply chain, which negatively affected their incomes (Farina and Reardon, 2000). For example, several studies in Latin America and Africa argued that small farmers were being left behind in the supermarket-driven horticultural marketing and trade (Dolan and Humphrey; 2001; Humphrey *et al.*, 2004; Key and Runsten, 1999; Reardon *et al.*, 2003a; Weatherspoon *et al.*, 2001). Likewise, Weatherspoon and Reardon (2003) reported that the rise of supermarkets in Southern Africa failed to help small producers who were almost completely excluded from dynamic urban markets due to quality and safety standards.

57. In contrast, recent research suggests a more nuanced picture of the effect of vertical coordination on small farm exclusion. In fact, surveys in Eastern Europe and the CIS found little evidence that small farmers have been excluded from supply chains (Dries and Swinnen, 2004; Dries *et al.*, 2009). In the CIS, the vast majority of companies have the same or smaller suppliers in 2003 than in 1997 (Swinnen, 2005). Minten *et al.* (2009) and Maertens and Swinnen (2009a) found that poor rural households experienced measurable gains from supplying high quality horticulture commodities to global retail chains in Madagascar and Senegal. In addition, Maertens and Swinnen (2009a) and Maertens *et al.* (2008) show that much of the welfare benefits for the poor can come through their participation in the labour market, which is ignored by most other studies. They found in Senegal that initially exports of fruits and vegetables were mainly based on contracts with farming households. However due to increasingly stringent food standards, vertical coordination changed towards fully integrated production on agro-industrial holdings. This has decreased contract farming and increased employment on agro-industrial farms. The study suggests that contract farming was highly beneficial for households, but more so for those households with more land, livestock and other assets. Agro-industry employment in Senegal did not appear biased with the poorest households participating. The income effects of this employment were significant although less than those from contract farming (Figure 9).

58. In China, Wang *et al.* 2009 found that despite the emergence of supermarkets in urban areas, there has been almost no penetration of modern supply chains into farm communities. In the area around Beijing, less than 6% of the purchases of horticultural products from farmers were by partners involved in modern supply chains - either supermarkets, professional suppliers or processing firms. In Shandong, where they studied producers of tomatoes and cucumbers, the share is even smaller (around 1%). Similar findings are reported by Huang *et al.* 2008, who found that almost all producers in Shandong were selling their apples and grapes into traditional marketing channels and not through modern supply chains.

59. One can conclude that, in general, companies tend to source from larger farmers, although there are exceptions to this pattern where small farmers dominate the agrarian structure. For example in the Czech Republic and Slovakia, where fruit and vegetable suppliers are mostly large farms, the retail sector preferred to contract with them because they were better able to deliver good quality and to finance investments themselves. But, even when companies source from larger farms, it is crucial to integrate the labor market effects in the welfare analysis. The few studies that did incorporate employment effects, show important welfare gains in rural households from wage employment on these farms. When companies

source product, they search for suppliers with the requisite non-land assets such as irrigation, management skills, farm equipment, and access to paved roads. Small farmers often lack credit, inputs, or skills, and therefore companies often introduce vertically coordinated farm assistance programs to address those constraints and to integrate these farmers in the supply chain. For example, in Croatia and Serbia, where fruit and vegetable suppliers are mostly small farms, supermarkets have introduced input assistance and supplier investment support (Reardon *et al.*, 2003b; Dries *et al.*, 2004).

Gender issues

60. An issue which has received little attention so far in the discussion on modern supply chains and welfare is gender; and the few studies that exist give mixed results. There is a body of literature that claims modern supply chains entail detrimental gender effects. Dolan (2001) points to the fact that female farmers are disadvantaged in contract farming schemes in the Kenyan export horticulture sector and Barrientos *et al.* (2001, 2003) indicate that female farm workers are exploited in the South African deciduous fruit sector.

61. However, these studies do not take in account the labour market effects that can occur in the presence of modern supply chains. Maertens and Swinnen (2009b) report, based a study of the supply chain for fresh fruit and vegetables in Senegal, that the emergence and spread of modern supply chains across developing countries is associated with direct beneficial effects for rural women and reduced gender inequalities in rural areas. They found that women benefit to a greater extent and more directly from large-scale estate production and agro-industrial processing, and from the creation of employment in these modern agro-industries than from high-value smallholder contract farming.

Farmers' health

62. In the 1980s and 1990s, the increase in export intensity of fresh fruit and vegetables and the export markets' demand for aesthetic attributes such as color, shape and spotlessness has encouraged farmers in transition and developing countries to rely increasingly on heavy amounts of pesticides (Ohayo-Mitoko, 1997; Thrupp *et al.*, 1995). This heavy reliance on pesticides has been accompanied by increased incidence of pesticide related acute and chronic illnesses.

63. However, the recent introduction of high food standards in modern supply chains has led to a reduction in the use of pesticides and consequently also a substantial improvement of farmers' health. For example, in Kenya, Asfaw *et al.* (2009) found that the adoption of GlobalGAP standards has a positive and significant impact on farmers' health both in terms of reduction of pesticides related to acute poisonings and its associated cost of illness. Farmers who adopt GlobalGAP standards experienced 70% less incidences of acute illness and spent about 50-60% less on restoring health compared with non-adopters (Asfaw *et al.*, 2009).

5. Concluding observations

64. Global food production and distributions systems have undergone tremendous changes in recent decades, particularly in in transition and developing countries. Companies and farms have been privatized, markets liberalized, and food supply chains integrated into the global economy. Over the past ten years, the impact of modern supply chains on primary producers has been rapidly increasing in the transition and developing countries in response to changing consumer demands regarding food quality and safety and the structural changes in the food supply chain, primarily through greater contracting and vertical coordination..

65. The studies reviewed in this report show that, while there is consensus that modern food supply chains (primarily increased contracting and vertical coordination) have important positive implications for production, much less survey-based research has been done on the welfare impacts of that transformation for farmers. Two questions examined but that require further analysis to draw any conclusions include the degree to which small farms and farm workers are included/excluded in this transformation process and the extent to which such inclusion raises incomes and/or modernize farming practices.

66. The existing studies indicate mixed results. Some studies have indicated that small and poor farmers have been systematically excluded from the modern supply chains, which negatively affected their incomes. Other studies suggest a more positive impact with little evidence of exclusion and positive welfare effects for farmers participating in contracting and vertical coordination schemes.

67. Findings on the welfare and income impacts of modern supply chains are also nuanced. Small producers often lack the necessary resources or human skills to adapt to new requirements but processing and distribution companies often introduce vertically coordinated farm assistance programs to address these constraints and integrate these producers in the supply chain. In some cases, smaller farms participating in modern supply chains were found to have received substantial positive welfare effects in the form of higher incomes through increased productivity and output; but also through the opportunity to invest in new technologies and innovations to upgrade the quality of their products in order to comply with the higher food standards of modern supply chains. In addition, some studies suggested that participation in modern supply chains reduced gender inequalities in rural areas and reduced the use of pesticides, thereby improving farmers' health and the local environment. When companies source from larger farmers, it is important to account for labor market effects in the analysis. The few studies that did so indicate important welfare gains in rural households from wage employment on these farms.

68. In this perspective, the emergence and rapid growth of modern supply chains offers opportunities to contribute to sustainable economic, societal and environmental development of rural areas in transition and developing countries. Private investments in the agro-food industry and the development of modern supply chains can lead to substantial innovation, including the transfer of new technologies, within the food and agriculture system in transition and developing countries, which can provide an (at least partial) response to three issues. First, innovations in the supply chain of transition and developing countries is needed to substantially increase productivity, which is necessary to respond to the growing demand for feed, food and non-food uses of agricultural raw materials. Second, by responding to the growing demand for high food standards, the adoption of alternative, more environmentally friendly production practices makes sure that productivity increases happen in an environmentally sustainable way. Finally, innovation can contribute to economic growth and play an important role in poverty alleviation.

69. While recognising the need for more research into these matters, the studies reviewed here suggest a number of ways in which governments can facilitate equity and efficiency gains in modern supply chains. *Reduce the transaction costs*: The main disadvantage of contracting with small farmers is that it substantially increases the transaction costs for the processing or retail companies. Governments can help to reduce these transaction costs by improving rural infrastructure to improve market access for remote areas, ensure reliable electricity service and provide adequate cooling and storage facilities. Investment in intermediary institutions, such as farmer associations and produce collection points, also help reduce transaction costs between farm and input supplier/processor. In addition, farmer associations can enhance producer bargaining power vis-à-vis suppliers and processors.

- Enhance competition: Competition tends to induce processors, retailers, and input suppliers to provide more supplier assistance programs and it constrains rent capture by up- or downstream companies. Competition in food supply chains can be maintained by ensuring domestic

competition policies are diligently applied to the sector while pursuing regulatory reforms and liberal trade policies that lower barriers to entry.

- Enhance bargaining power of (small) farmers: Governments can offer a number of different means of support to smaller operators such as measures to increase the transparency of contracts, provide for dispute settlement arrangements, provide market benchmarks for price negotiations, training in contract rights/obligations. Establishing production quality control centers enhances the bargaining power of suppliers by ensuring standardised payments for given levels of product quality.

REFERENCES

- Abbott, J. C. (1967), “The development of marketing institutions”, In H. M. Southworth, & B. F. Johnston (Eds.), *Agricultural development and economic growth* (pp. 364–399). Ithaca: Cornell University Press.
- Aksoy M.A. (2005), “The Evolution of Agricultural Trade Flows”, In Aksoy M.A. and J. C. Beghin (eds.), *Global Agricultural Trade and Developing Countries*, The World Bank, Washington D.C.
- Asfaw, S., Mithöfer, D. and H. Waibel (2009), “Food-Safety Standards and Farmers Health: Evidence from Kenyan’s Export Vegetable Growers”, Contributed paper at the International Association of Agricultural Economists Conference, Beijing, China, August 16-22, 2009.
- Barrientos, S., Dolan, C. and A. Tallontire (2001), “Gender and Ethical Trade: A Mapping of the Issues in African Horticulture”, Institute of Development Studies, University of Sussex, UK.
- Barrientos, S., Dolan, C. and A. Tallontire (2003), “A Gendered Value Chain Approach to Codes of Conduct in African Horticulture”, *World Development*, Vol. 31(9), pp. 1511-1526.
- Birthal, P., Gulati, A. and P.K. Joshi (2005), “Vertical Coordination in High-Value Food Commodities: Implications for Smallholders”, MTID Discussion Paper No. 85, International Food Policy Research Institute, Washington D.C.
- Brunn, S.D. (2006), “Wal-Mart World: The World’s Biggest Corporation in the Global Economy”, Routledge. 424 pp.
- Chowdhury S, Gulati A. and S.E. Gumbira (2004), “High-value Products, Supermarkets and Vertical Arrangements in Indonesia”, MTID Discussion Paper, International Food Policy Research Institute, Washington, D.C.
- Clarke, R., Davies, S. Dobson, P., and M. Waterson (2002), “Buyer Power and Competition in European Food Retailing”, Edward Elgar Publications, 220p.
- Digal, L. and S. Concepcion (2004), “Regoverning Markets: Securing Smallholder Producer Participation in Restructured national and Agri-food System: The case of The Philippines”, International Institute for Environment and Development, Project Regoverning Markets.
- Dirven, M. (1996), “Agroindustria y pequeña agricultura. Sintesis comparative de distintas experiencias (LC/R.1663)”, Santiago de Chile, CEPAL.
- Dobson, P.W. and M. Waterson (1997), “Countervailing Power and Consumer Prices”, *The Economic Journal*, Vol. 107(441), pp. 418-30.
- Dobson, P.W., Clarke, R., Davies, S. and M. Waterson (2001), “Buyer Power and its Impact on Competition in the Food Retail Distribution Sector of the European Union”, *Journal of Industry, Competition and Trade*, Vol. 1(3), pp. 247-81.

- Dobson, P. (2003), "Buyer Power in Food Retailing: The European Experience", OECD paper, Paris.
- Dobson, P.W., Waterson, M. and S.W. Davies (2003), "Concentration in European Food Retailing", *Journal of Agricultural Economics*, Vol. 54(1), pp. 111-25.
- Dolan, C. and J. Humphrey (2000), "Governance and Trade in Fresh Vegetables: The Impact of UK Supermarkets on the African Horticulture", *Journal of Development Studies*, Vol. 37, pp. 147-176.
- Dolan, C. (2001), "'The Good Wife's Struggle over Resources in the Kenyan Horticulture Sector", *Journal of Development Studies*, Vol. 37(3), pp. 39-70.
- Delgado, C., Narrod, C., Tiongco, M., Chatterjee, A., delos Reyes, A. and C. Narrod (2003), "Policy, Technical, and Environmental Determinants and Implications of the Scaling-up of Broiler and Swine Production in the Philippines", Annex I, Final Report of IFPRI-FAO Livestock Industrialization Project: Phase II. International Food Policy Research Institute, Washington D.C.
- Dries, L. and J.F.M. Swinnen (2004), "Foreign Direct Investment, Vertical Integration and Local Suppliers: Evidence from the Polish Dairy Sector", *World Development*, Vol. 32, pp. 1525-1544.
- Dries, L., Reardon, T. and J.F.M. Swinnen (2004), "The Rapid Rise of Supermarkets in Central and Eastern Europe: Implications for the Agrifood and Rural Development", *Development Policy Review*, Vol. 22(5), pp. 525-556.
- Dries, L., Germenji, E., Noev, N. and J.F.M. Swinnen (2009), "Farmers, Vertical Coordination, and the Restructuring of Dairy Supply Chains in Central and Eastern Europe", *World Development*, Vol. 37, pp. 1742-1758.
- Einarsson, A. (2007), "The Retail Sector in the Nordic Countries: A Comparative Analysis", *Bifrost Journal of Social Science*, Vol. 1, pp. 31-42.
- Fafchamps, M., Vargas-Hill, R. and B. Minten (2006), "The Marketing of Non-staple crops in India, Report for the World Bank, Washington D.C.
- Farina, E. and T. Reardon (2000), "Agrifood Grades and Standards in the Extended Mercosur: Their Role in the Changing Agrifood System", *American Journal of Agricultural Economics*, Vol. 82, pp. 1170-1176.
- FAO (2001), "Contract farming: Partnerships for Growth", FAO Agricultural Services Bulletin No. 145, FAO, Rome.
- Fulponi, L. (2007), "The Globalization of Private Standards and the Agri-food System", In Swinnen, J.F.M. (ed.), "Global Supply Chains, Standards, and the Poor", Wallingford, Oxfordshire: CABI Publishing.
- Gehlhar, M. (2008), "Global Food Markets: Global Food Industry Structure", USDA/ERS Briefing rooms, March 26, 2008.
- Gorton, M. and J. White (2007), "Transformation and Contracting in the Supply Chains of the Former Soviet Union: Evidence from Armenia, Georgia, Moldova, Ukraine and Russia", in Swinnen, J.F.M. (ed.), "Global Supply Chains, Standards and the Poor", Wallingford, Oxfordshire: CABI Publishing.

- Gow, H. and J.F.M. Swinnen (1998), "Up- and Downstream Restructuring, Foreign Direct Investments, and Hold-up Problems in Agricultural Transition", *European Review of Agricultural Economics*, Vol. 25(3), pp. 331-350.
- Gow, H., Streeter, D. and J.F.M. Swinnen (2000), "How private contract enforcement mechanisms can succeed where public institutions fail: The case of Juhocukor a.s.", *Agricultural Economics*, Vol. 23(3), pp. 253-265.
- Gulati, A., Minot, N., Delgado, C. and S. Bora (2007), "Growth in High-value Agriculture in Asia and the Emergence of Vertical Links with Farmers", In Swinnen, J.F.M. (ed.), "Global Supply Chains, Standards, and the Poor", Wallingford, Oxfordshire: CABI Publishing.
- Gutman, G. (2002), "Impact of the Rapid Rise of Supermarkets on Dairy Products in Argentina", *Development Policy Review*, Vol. 20(4), pp. 409-427.
- Henson, S., Loader, R., Swinbank, A., Bredahl, M. and N. Lux (2000), "Impact of Sanitary and Phytosanitary Measures on Developing Countries", Working Paper, The University of Reading.
- Henson, S. (2006), "The role of public and private standards in regulating international food markets", Paper presented at the IATRC summer symposium: Food regulation and trade, institutional framework, concepts of analysis and empirical evidence, Bonn, 28-30 May 2006.
- Herath, D. and A. Weersink (2009), "From Plantations to Smallholder Production: The Role of Policy in the Reorganization of the Sri Lankan Tea Sector", *World Development*, Vol. 37(11), pp. 1759-1772.
- Hu, D., Reardon, T., Rozelle, S., Timmer, P. and H. Wang (2004), "The Emergence of Supermarkets with Chinese Characteristics: Challenges and Opportunities for China's Agricultural Development", *Development Policy Review*, Vol. 22, pp. 557-586.
- Huang, J., Dong, X., Wu, Y., Zhi, H., Nui, X., Huang, Z. and S. Rozelle (2007), "Regoverning Markets: The China Meso-level Study", Center for Chinese Agricultural Policy, Chinese Academy of Sciences, Beijing.
- Huang, J., Wu, Y., Zhi, H. and S. Rozelle (2008), "Smallholder Incomes, Food Safety and Producing, and Marketing China's Fruit", *Review of Agricultural Economics*, Vol. 30, pp. 469-479.
- Humphrey, J., McCulloch, N. and M. Ota (2004), "The Impact of European Market Changes on Employment in the Kenyan Horticulture Sector", *Journal of International Development*, Vol. 16, pp. 63- 80.
- Jaffee, S. and S. Henson (2004), "Standards and Agro-Food Exports from Developing Countries: Rebalancing the Debate", Policy Research Working Paper No. 3348, World Bank, Washington D.C.
- Jha, S. (1992), "Consumer Subsidies in India: Is Targeting Effective?", *Development and Change*, Vol. 23(4), pp. 101-128.
- Key, N. and D. Runsten (1999), "Contract farming, Smallholders, and Rural Development in Latin America: the Organization of Agroprocessing Firms and the Scale of Outgrower Production", *World Development*, Vol. 27, pp. 381-401.

- Kinsey, J. (1998), "Concentration of Ownership in Food Retailing: A Review of the Evidence about Consumer Impact", The Retail Food Industry Center, Working Paper 98-04.
- Kinsey, J. (2003), "Emerging Trends in the New Food Economy: Consumers, Firms and Science, OECD paper, Paris.
- Koc, A. A., Codron, J.-M., Tekeliog̃lu, Y., Lemeilleur, S., Tozanli, S., Aksoy, S., Bignebat, A. C., Demirer, R., and N. Mencet, (2007), "Component 1 Regoverning Market Programme: Restructuring of Agrifood chains in Turkey", Turkey National and Local Meso Study, Department of Economics, Akdeniz University, Antalya, Turkey.
- London Economics (2008), "The Evolution of the High-Volume Retail Sector in Europe over the past 5 years: Final Report", Consultative Commission on Industrial Change.
- Maertens, M., Colen, L. and J.F.M. Swinnen (2008), "Globalization and Poverty in Senegal: A Worst Case Scenario?", LICOS Discussion Paper No. 217, Leuven.
- Maertens, M. and J.F.M. Swinnen (2009a), "Trade, Standards, and Poverty: Evidence from Senegal", World Development, Vol. 37, pp. 161-178.
- Maertens, M. and J.F.M. Swinnen (2009b), "Gender and Modern Supply Chains in Developing Countries", LICOS Discussion Paper No. 231, Leuven.
- McCorrison, S. (2006), "Imperfect Competition and International Agricultural Commodity Markets", In Sarris, A. and D. Hallam (eds.), "Agricultural Commodity Markets and Trade: New Approaches to Analyzing Market Structure and Instability", Cheltenham: Edward Elgar Publishing Limited.
- Messinger, P. R. and N. Chakravarthi (1995), "Has Power Shifted in the Grocery Channel?" Marketing Science, Vol. 14(2), pp. 189-223.
- Minot, N. and M. Ngigi (2004), "Are Horticultural Exports a Replicable Success Story? Evidence from Kenya and Côte d'Ivoire", EPTD Discussion Paper No. 120, IFPRI, Washington, DC.
- Minten, B., Randrianarison, L. and J.F.M. Swinnen (2009), "Global Retail Chains and Poor Farmers: Evidence from Madagascar", World Development, Vol. 37, pp. 1728-1741.
- Natawidjaja, R., Reardon, T., Shetty, S. Noor, T.I., Perdana, T., Rasmikayati, E., *et al.* (2007). Horticultural producers and supermarket development in Indonesia. UNPAD/MSU/World Bank. World Bank report no. 38543. The World Bank, Washington D.C.
- National Commission on Food Marketing (1966), "Food from Farmer to Consumer", US Government Printing Office, Washington D.C.
- OECD (2001), "Market Concentration in the Agro-food Sector: Selected Economic Issues", OECD, Paris.
- OECD (2006), "Supermarkets and the Meat Supply Chain: The Economic Impact of Food Retail on Farmers, Processors and Consumers", OECD, Paris.
- Ohayo-Mitoko, G.J.A. (1997), "Occupational Pesticide Exposure among Kenyan Agricultural Workers: An Epidemiological and Public Health Perspectives", PhD dissertation, Wageningen Agricultural University, Wageningen, 1997.

- Pingali, P. (2006), “Westernization of Asian Diets and the Transformation of Food Systems: Implications for Research and Policy”, *Food Policy*, Vol. 32, pp. 281–298.
- Poulton, C., Gibbon, P., Hanyan-Mlambo, B., Kydd, J. Maro, W., Larsen, M.N., Osorio, A., Tschirley, D. and B. Zulu (2004), “Competition and Coordination in Liberalized African Cotton Market Systems”, *World Development*, Vol. 32(3), pp. 519-536.
- Reardon, T. and J.A. Berdegúe (2002), “The Rapid Rise of Supermarkets in Latin America: Challenges and Opportunities for Development”, *Development Policy Review*, Vol. 20(4), pp. 317–334.
- Reardon, T., Timmer, C. P., Barrett, C. B. and J. Berdegue (2003a), “The Rise of Supermarkets in Africa, Asia, and Latin America”, *American Journal of Agricultural Economics*, Vol. 85, pp. 1140-1146.
- Reardon, T., Vrabec, G., Karakas, D. and C. Fritsch (2003b), “The Rapid Rise of Supermarkets in Croatia: Implications for Farm Sector Development and Agribusiness Competiveness Programs”, Report for USAID. DAI and Michigan State University.
- Reardon, T. and J.F.M. Swinnen (2004), “Agrifood Sector Liberalization and the Rise of Supermarkets in Former State-controlled Economies: Comparison with Other Developing Countries”, *Development Policy Review*, Vol. 22(4), pp. 317-334.
- Reardon, T. and C.P. Timmer (2005), “Transformation of Markets for Agricultural Output in Developing Countries since 1950: How has thinking changed?” In Evenson, R., Pingali, P. and T.P. Schultz (eds.), “Handbook of Agricultural Economics (Vol 3A): Agricultural Development: Farmers, Farm Production, and Farm Markets”, Elsevier, Holland.
- Reardon, T., Berdegúe, J.A. (2006), “The retail-led transformation of agrifood systems and its implications for development policy”, *Rimisp-Latin American Center for Rural Development*.
- Reardon, T., Berdegúe, J. A., Echanove, F., Cook, R., Tucker, N., Martinez, A., *et al.* (2007), “Supermarkets and Horticultural Development in Mexico: Synthesis of findings and recommendations to USAID and GOM”, Report submitted by MSU to USAID/Mexico and USDA, Washington D.C.
- Reardon, T., Barret, C.B., Berdegúe, J.A. and J.F.M. Swinnen (2009), “Agrifood Industry Transformation and Small Farmers in Developing Countries”, *World Development*, Vol. 37(11), pp. 1717-1727.
- Rozelle, S. and J.F.M. Swinnen (2004), “Success and Failure of Reform Insights from the Transition of Agriculture”, *Journal of Economic Literature*, Vol. 42, pp. 404-456.
- Senauer, B. and L. Venturini (2001), “The Globalization of Food Systems: A conceptual Framework and Empirical Patterns”, Working Paper 05-01, The Food Industry Centre, University of Minnesota.
- Sexton, R.J. and N. Lavoie (2001), “Food Processing and Distribution: An Industrial Organization Approach”, In Gardner, B.L. and G.C. Rauser (eds.) *Handbook of Agricultural Economics*, Vol. 1B. Amsterdam: North Holland – Elsevier.
- Swinnen, J.F.M. (2005), “When the Market Comes to You - Or Not. The Dynamics of Vertical Coordination in Agro-Food Chains in Europe and Central Asia”, Report, The World Bank, Washington D.C.

- Swinnen, J.F.M., Sadler, M. and A. Vandeplas (2007), “Contracting and Rent Distribution in Supply Chains: Theory and Empirical Evidence from Central Asia”, In Swinnen, J.F.M. (ed.), “Global Supply Chains, Standards, and the Poor”, Wallingford, Oxfordshire: CABI Publishing.
- Swinnen, J.F.M. (ed.) (2007), “Global Supply Chains, Standards and the Poor”, CABI publishing, Oxford.
- Swinnen, J.F.M. and T. Vandemoortele (2008), “The Political Economy of Nutrition and Health Standards in Food Markets”, *Review of Agricultural Economics*, Vol. 30, pp. 460- 468.
- Swinnen, J.F.M. and A. Vandeplas (2009), “Market Power and Rent in Global Supply Chains”, Plenary Paper at the International Association of Agricultural Economists Conference, Beijing, China, August 16-22, 2009.
- Thrupp, L.A., Bergeron, G. and W. F. Waters (1995), “Bittersweet Harvest for Global Supermarkets: Challenges in Latin America's Export Boom”, Natural Resources Institute, Washington D.C.
- Unnevehr, L. (2000), “Food Safety Issues and Fresh Food Product Exports from LDCs”, *Agricultural Economics*, Vol. 23, pp. 231-240.
- USDA (2002), “Thailand Retail Food Sector Report”, GAIN Report. Foreign Agricultural Service, U.S. Department of Agriculture, Washington D.C.
- Warning M. and N. Key (2002), “The Social Performance and Distributional Impact of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal”, *World Development*, Vol. 30(2), pp. 255-263.
- Wang, H., Dong, X., Rozelle, S., Huang, J. and T. Reardon (2009), “Producing and Procuring Horticultural Crops with Chinese characteristics: The Case of Northern China”, *World Development*, Vol. 37, pp. 1791-1801.
- Weatherspoon, D. D., Cacho, J. and R. Christy (2001), “Linking Globalization, Economic Growth and Poverty: Impacts of Agribusiness Strategies on Sub-Saharan Africa”, *American Journal of Agricultural Economics*, Vol. 83, pp. 722 -729.
- Weatherspoon, D. D. and T. Reardon (2003), “The Rise of Supermarkets in Africa: Implications for Agrifood Systems and the Rural Poor”, *Development Policy Review*, Vol. 21, pp. 333-
- Wilkinson, J. (2004), “The Food Processing Industry, Globalization, and Developing Countries”, *Electronic Journal of Agricultural and Development Economics – e-JADE*, Vol. 1(2), pp. 184–201.
- Xiang, T., Huang, J., Kancs, d. and J.F.M. Swinnen (2009), “Standards Driven Rural Development: A General Equilibrium Model with Market Imperfections”, Contributed paper at the International Association of Agricultural Economists Conference, Beijing, China, August 16-22, 2009

TABLES

Table 1. Waves of retail transformation in Eastern Europe

Indicators	Year	First Wave				Second Wave			Third Wave	
		CZ	HU	PL	SK	CR	RO	BU	RU	UK
Retail Development										
% modern retail in total	1998	54	46	27	34	19	3	5	-	-
	2002	55	48	44	49	42	8	23	1-2	<1
Foreign food retail sales per urban resident (USD)	2002	808	503	302	377	93	64	148	4	2
% income spent in foreign food retailers	2002	14	10	7	8	2	3	8	0.2	0.3
Reform & Development										
Reform progress EBRD	1998	3.5	3.7	3.5	3.3	3.0	2.7	2.8	2.5	2.5
	2002	3.4	3.7	3.5	3.3	3.5	3.1	3.3	2.9	2.7
EU membership	2004	2004	2004	2004	2004	-	2007	2007	-	-
GDP/capita (USD)	1998	5500	4600	4100	4000	4800	1900	1550	1800	800
	2002	6700	6600	4900	4400	5000	2100	2000	2400	850
Income category		Upper middle	Upper middle	Upper middle	Upper middle	Upper middle	Lower middle	Lower middle	Lower middle	Lower middle
Demography										
% urban population	2002	75	65	63	58	59	56	68	73	68
% females in workforce	2002	64	52	60	63	60	62	71	64	62
Male/female labor force	2002	1.2	1.3	1.2	1.2	1.2	1.2	1.1	1.2	1.2

Source: Dries *et al.* (2004)

Table 2. Development of supermarkets in China (1994-2002)

Year	Stores		Sales		Share in total national retail (%)
	Number	Annual Increase (%)	USD bn	Annual increase (%)	
1994	2500	-	0.38	-	0.18
1995	6000	140.0	0.96	167	0.38
1996	10000	66.7	3.61	275	1.21
1997	15000	50.0	5.06	40	1.54
1998	21000	40.0	12.05	138	3.43
1999	26000	23.8	18.07	50	4.82
2000	32000	23.1	26.51	47	6.50
2001	40500	26.6	37.11	40	8.20
2002	53100	31.1	55.13	49	11.20

Source: Hu *et al.* 2004

Table 3. Growth in modern retail sales by region (%)

	South America	Central America	Mexico	Southeast Asia	South Asia	East Asia Transition	Europe CIS	Central Europe & Baltics	Southeast Europe	Sub-Saharan Africa	South Africa	North Africa	Middle East
2002	-37	4	-8	21	32	50	56	17	62	7	-18	19	7
2003	-9	15	-7	19	49	36	54	25	43	11	51	30	24
2004	8	-5	2	8	40	19	47	16	39	-3	22	19	17
2005	18	-1	8	9	57	19	30	9	15	3	3	12	10
Average	-5	3	-1	14	44	31	47	17	40	4	14	20	15
Real GDP Growth Rate	3	3	2	5	7	9	7	4	5	4	4	5	4

Region	Countries
South America	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela
Central America	El Salvador, Guatemala, Honduras and the Dominican Republic
Southeast Asia	Indonesia, Malaysia, Philippines and Thailand
South Asia	India and Pakistan
East Asia Transition	China and Vietnam
Europe CIS	Moldova, Russia and Ukraine
Central Europe & Baltics	Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia
Southeast Europe	Bosnia and Herzegovina, Bulgaria, Croatia, Romania and Serbia
Sub-Saharan Africa	Côte d'Ivoire, Ghana, Kenya and Tanzania
North Africa	Algeria, Morocco and Tunisia
Middle East	Egypt and Lebanon

Source: Reardon and Berdegue (2006).

**Table 4. The changing structure of world agricultural trade, 1980-2000
(% of total exports)**

Product classification	World Exports		Developing country exports		Industrial country exports	
	1980/81	2000/01	1980/81	2000/01	1980/81	2000/01
Tropical products						
Coffee, cocoa, and tea	8.5	5.4	18.3	8.5	2.5	3.6
Nuts and spices	1.3	1.5	2.4	2.8	0.7	0.8
Textile fibres	5.9	2.8	8.0	3.3	4.5	2.6
Sugar, confectionary	6.4	3.1	10.5	4.3	3.9	2.3
Subtotal	22.0	12.7	39.2	18.9	11.6	9.3
Temperate products						
Meat	11.9	12.0	7.2	6.0	14.8	15.4
Milk products	5.0	5.2	0.3	1.1	7.9	7.6
Grains	16.9	9.9	9.3	7.0	21.6	11.6
Animal feed	7.7	6.4	7.5	8.5	7.7	5.3
Oil and oil seeds	4.7	4.8	4.6	5.5	4.8	4.4
Subtotal	46.3	38.3	28.8	28.1	56.9	44.2
Seafood, fruits, and vegetables						
Fish and seafood	6.0	12.2	6.9	19.4	5.5	8.0
Fruits and vegetables	13.7	18.9	14.7	21.5	13.1	17.3
Subtotal	19.8	31.0	21.6	41.0	18.7	25.4
Other processed products						
Tobacco, cigarettes	2.8	4.2	2.6	3.3	3.0	4.8
Beverages	4.7	8.6	1.1	3.6	6.9	11.5
Other products	4.4	5.1	6.7	5.2	3.0	5.0
Subtotal	11.9	17.9	10.4	12.1	12.8	21.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Aksoy (2005).

Table 5. Farm assistance programs offered by dairy companies in Central Europe

Company Name	Credit – specific	Credit - general	Input supply	Extension service	Veterinary service	Bank loan guarantee
POLAND**						
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
BULGARIA						
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)
lotovi	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
Meggle	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
SLOVAKIA						
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(2000)	N	Y(1998)
Tatranska	Y(2001)	N	Y(2000)	Y(2000)	N	N
Nutricia Dairy	Y(2000)	N	N	N	N	Y(2000)
ROMANIA						
Danone	Y		Y	Y		Y
Friesland	Y		Y	Y		Y
Promilch	Y		Y	Y		Y
Raraul	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: Swinnen (2005).

Table 6. Distribution and Impact of Contract Support Measures in 5 CIS countries (Armenia, Georgia, Moldova, Russia and Ukraine)

Measure	% of sample offering particular support measure	Ave. % change in farm yields due to measure	Ave. % change in farm output reaching high standards due to measure
Prompt payments	46.7	11.4	12.0
Transportation	45.0	6.8	5.7
Credit	38.8	9.3	8.8
Physical inputs	33.3	12.4	14.2
Quality control	31.7	7.6	17.2
Guaranteed prices	23.3	11.1	8.9
Agronomic Support	21.7	6.5	5.0
Farm loan guarantees	18.3	6.8	6.0
Machinery	16.7	5.0	4.0
Specialist storage	15.0	10.0	8.3
Harvest / handling	11.8	9.3	5.4
Business / financial management	10.0	6.2	4.2
Market access	10.0	11.2	14.2
Veterinary support	8.3	17.0	17.0
Investment loans	6.7	5.5	5.0
Average		9.1	9.5

Source: White and Gorton (2007).

Table 7. Vertical coordination in Latin-American agri-food chains

Product	Destination	Contracting					Vertical Integration
		Marketing	Technical assistance	Credit	Inputs	Management	
Tomato(paste)							
Nicaragua	Domestic	X					
Paraguay	Domestic						
Ecuador	Domestic						X
Mexico	Domestic	X					X
Peru	Domestic						X
Fruit &Vegetables							
Guyana	Domestic	X					
Ecuador	Domestic	X					
Trinidad & T	Domestic	X					
Mexico	Export	X	X	X	X	X	X
Guatemala	Export	X	X	X	X	X	X
El Salvador	Export	X	X	X	X		
Peru	Export	X					X
Chicken							
Trinidad & T	Domestic	X	X	X	X		X
Jamaica	Domestic	X		X			
Tobacco							
Chile	na	X	X	X	X		
Guatemala	na	X	X	X	X		
Sugarcane							
Nicaragua	Exp&Dom	X	X		X		X
Guatemala	Exp&Dom						X
Sesame Seed							
Nicaragua	Export	X		X			
Guatemala	Export	X					
El Salvador	Export						
Malt. barley							
Chile	Domestic	X	X		X		
Peru	Domestic	X		X	X		
Rice							
Trinidad & T	Domestic	X	X		X		
Paraguay	na	X		X			
Dominican R	na	X					
Dairy							
Trinidad & T	Domestic	X	X	X			
Jamaica	Domestic	X					
Ecuador	Domestic	X					

Source: Dirven (1996).

Table 8. Production and transaction cost of milk, broiler and vegetable production in contract and non-contract farming in India (Rs/ton)

Commodity	Contract farming			Non-contract farming		
	Production cost	Transaction cost	Total cost	Production cost	Transaction cost	Total cost
Milk	5,586	100	5,686	5,728	1,442	7,170
Broiler*	808	38	846	27,322	90	27,412
Vegetable**	1,485	35	1,520	1,630	437	2,067

Note: For broiler, the firm provides free chicks, feed and medicines to the contract farmers. Vegetable costs refer to spinach.

Source: BIRTHAL *et al.* (2005).

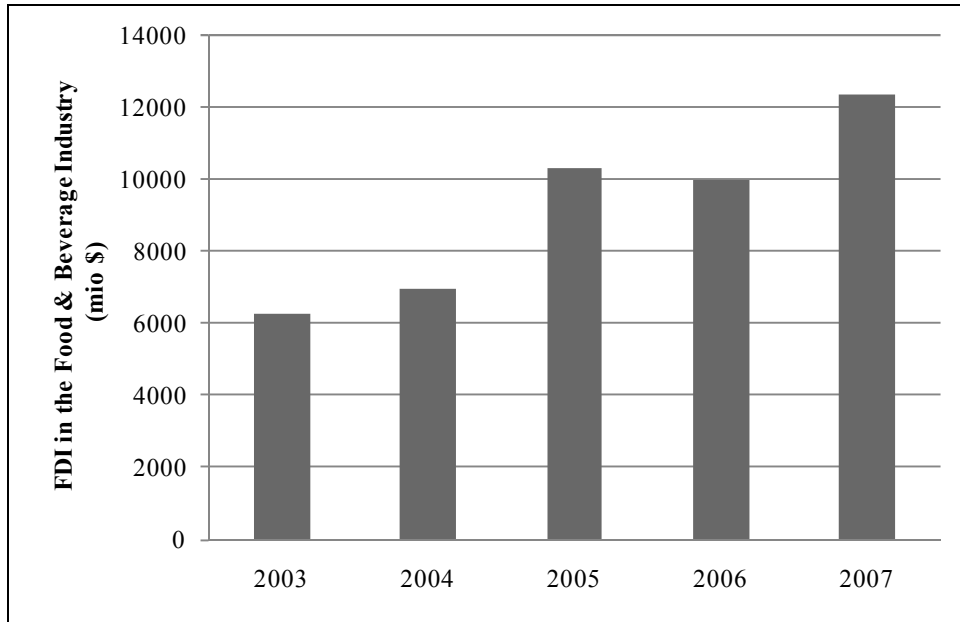
Table 9. Contract Motivations for farms in Central Europe

Most Important Reason for Contracting (%)	Czech 1999	Slovak 1999	Hungary 1997
Higher prices	9	8	10
Stable prices	7	22	33
Guaranteed sales	64	50	43
Pre-payment	7	13	3
Access to credit	0	0	9
Access to inputs and assistance	7	6	2
Other	6	2	0

Source: Swinnen (2005).

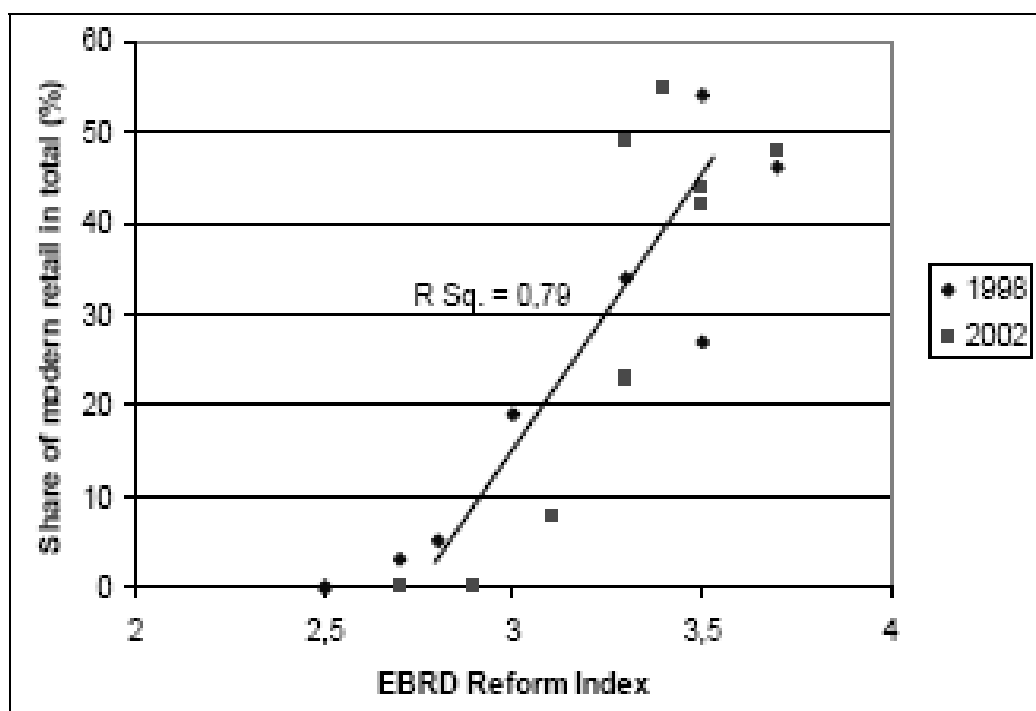
FIGURES

Figure 1. FDI in the Food & Beverage Industry in Eastern Europe



Source: World Investment Reports (Various years)

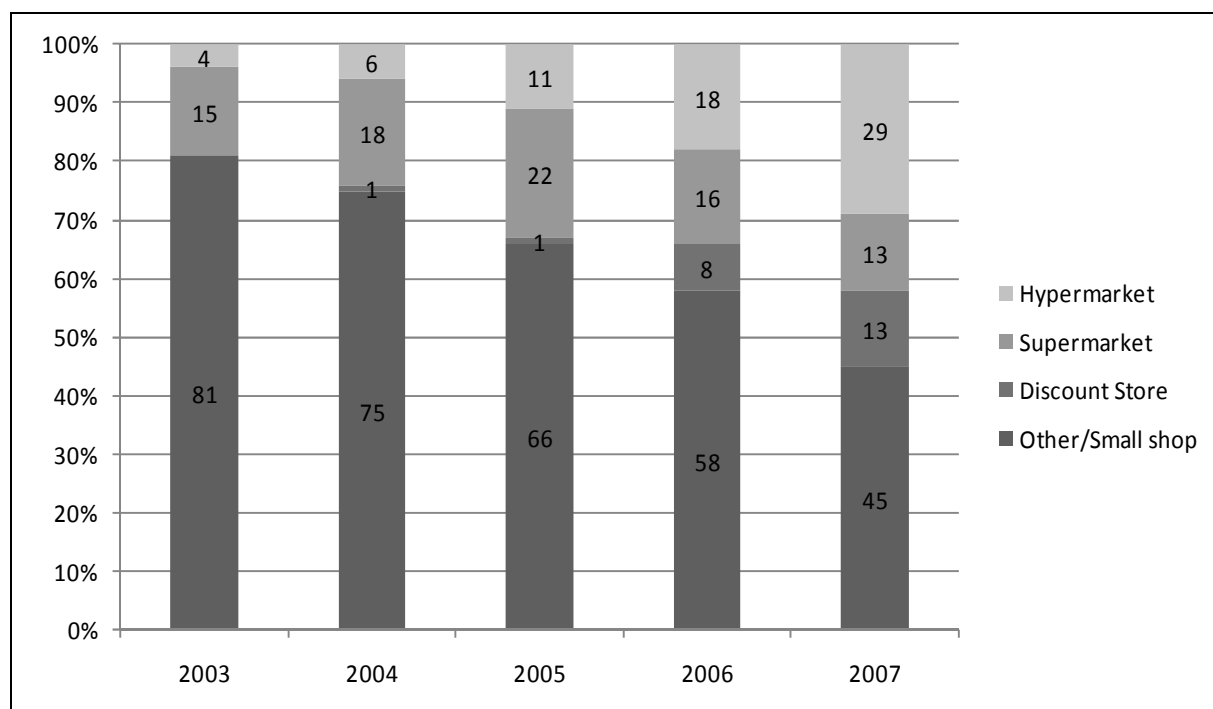
Figure 2. Share of the Modern Retail Sector in Total and Reform Progress



* 1998 and 2002 data for Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, Ukraine.

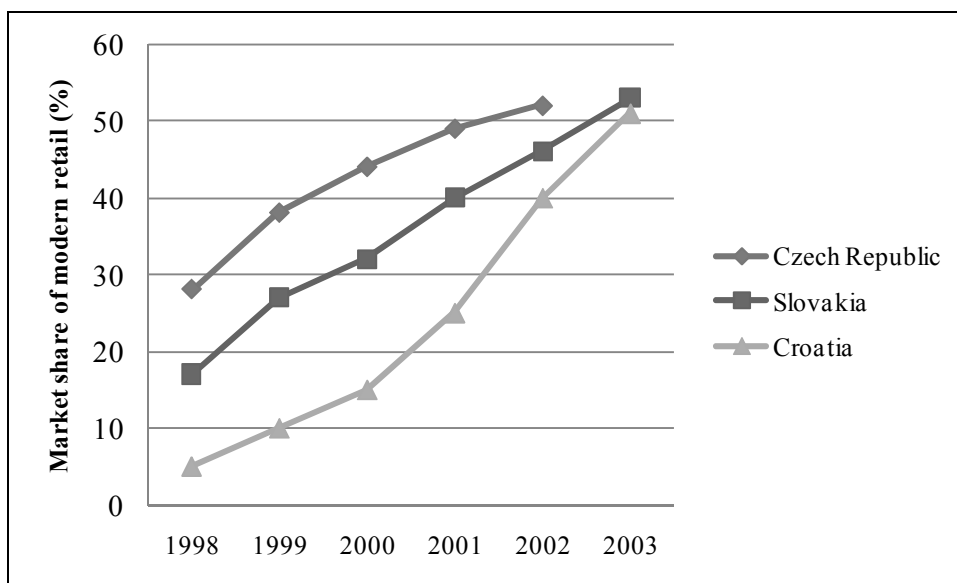
Source: Dries et al. (2004)

Figure 3. The Main Shopping Place for Food in 2008 in Romania



Source: Shopping Monitor Central & Eastern Europe 2009 (survey by Incoma GfK).

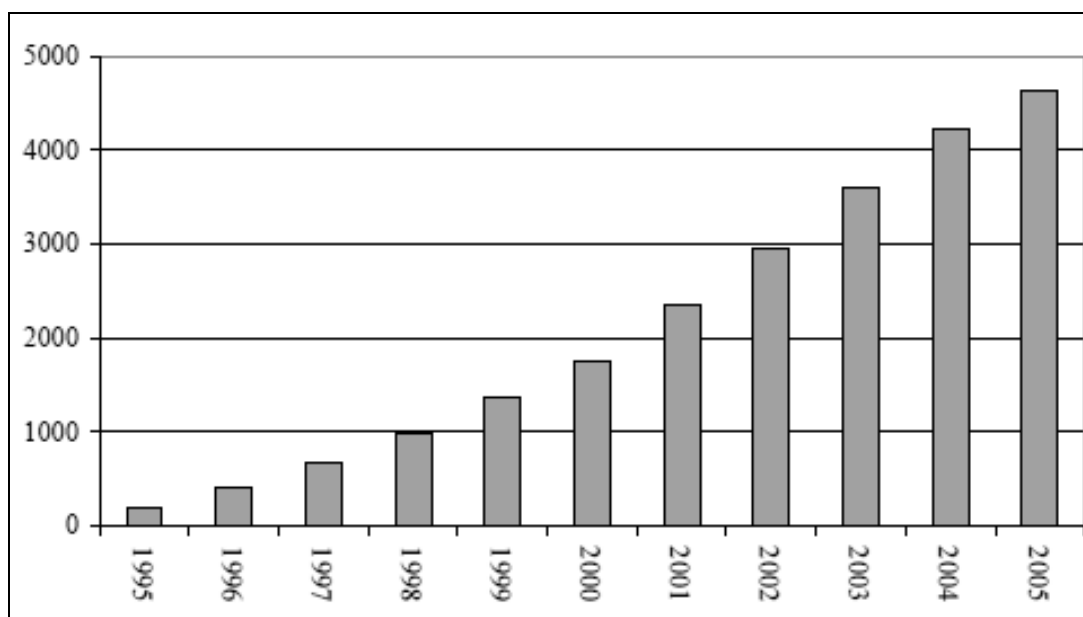
Figure 4: The Spread of the Modern Retail Sector*



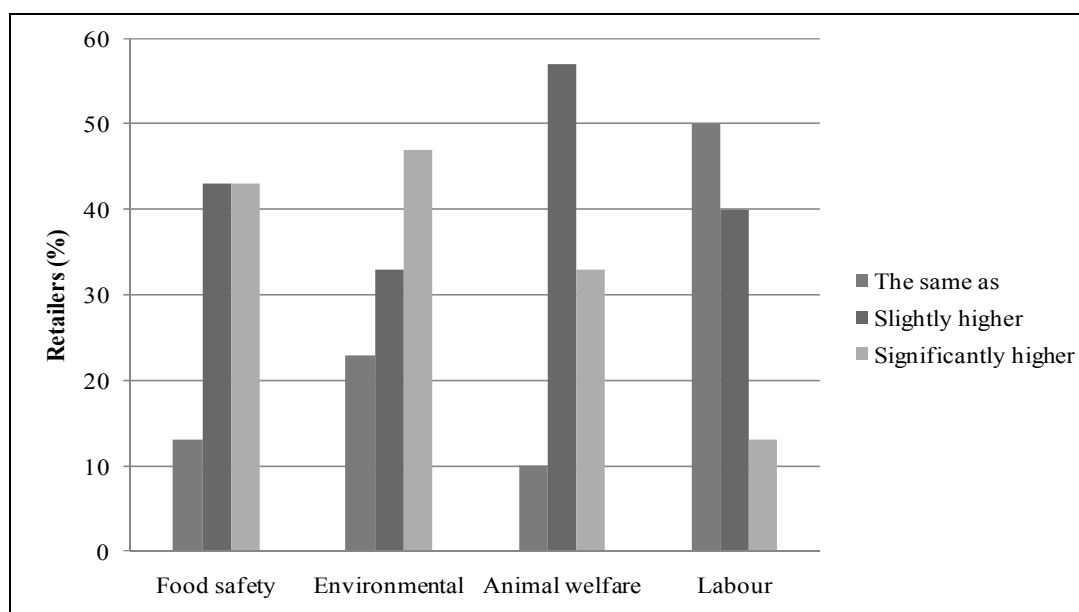
* The modern retail sector comprises hypermarkets, supermarkets, and discount stores

Source: Dries et al. (2004)

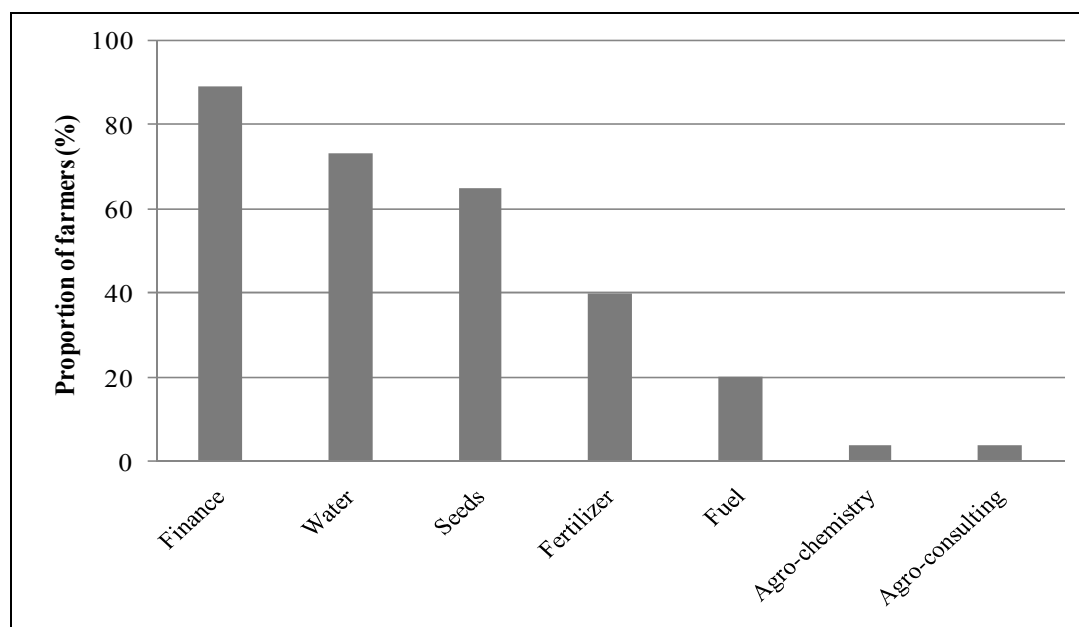
Figure 5. Notification of new SPS measures to the WTO, 1995 to 2005



Source: Henson (2006)

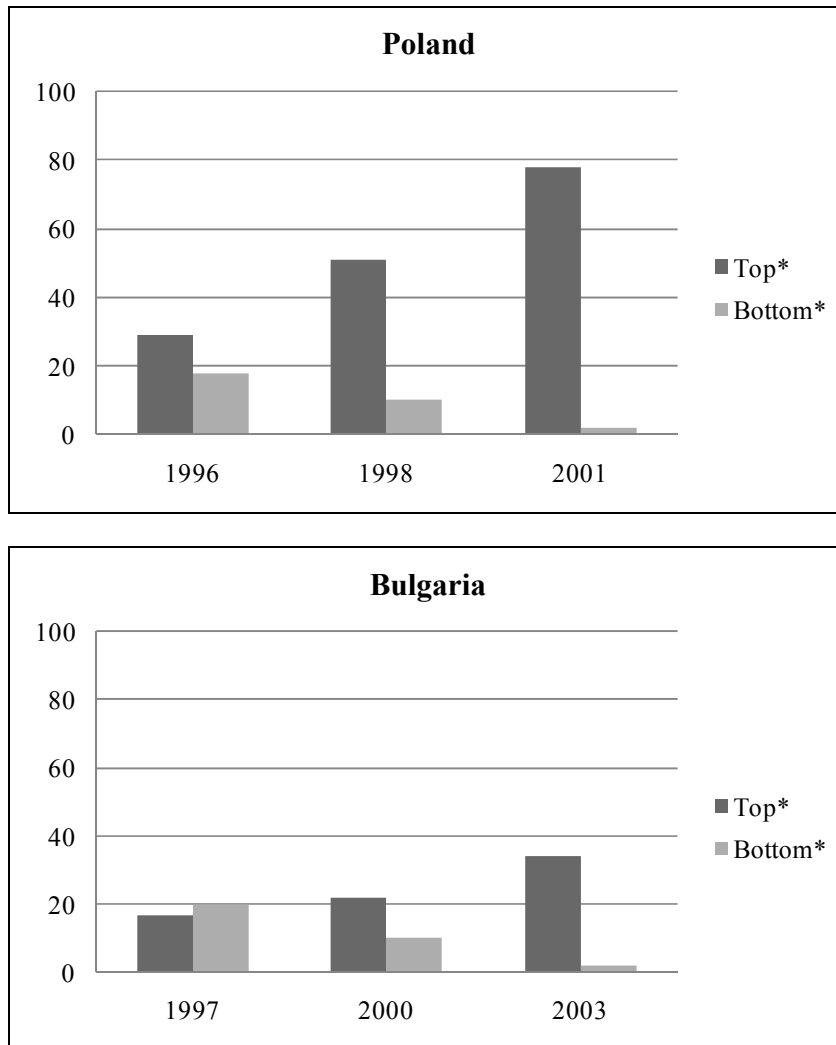
Figure 6: Retailers' Self Assessed Standards compared to those of the Government

Source: Fulponi (2007).

Figure 7. Proportion of farmers receiving specific aspects of farming assistance from cotton gins in Kazakhstan in 2003

Source: Swinnen *et al.* (2007).

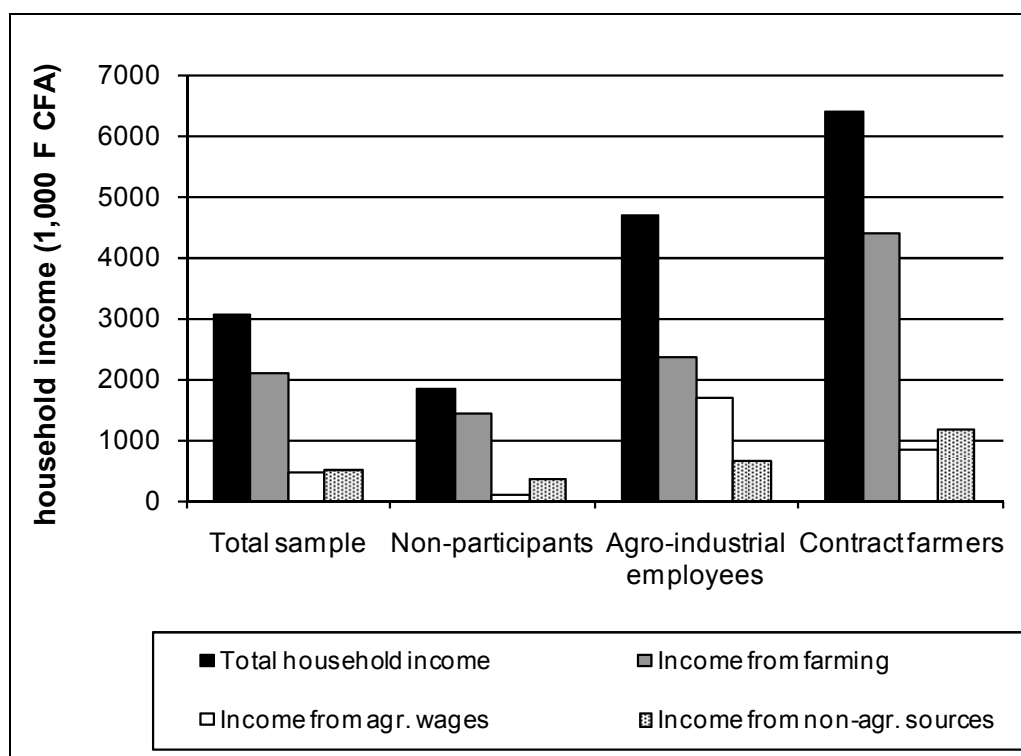
Figure 8. Change in Milk Quality in Eastern Europe



*Average share in total milk supply; **milk deliveries to the Campina factory in Stupino

Source: Dries *et al.* (2009)

Figure 9: Income effects of bean exports in Senegal



Source: Maertens and Swinnen (2009a)