

THE IMPACT OF THE GLOBAL FINANCIAL AND ECONOMIC CRISIS ON THE AGRO-FOOD SECTOR OF CENTRAL AND EASTERN EUROPEAN AND CENTRAL ASIAN COUNTRIES

J. Popp¹, N. Potori², R.G. Garay³
Erika Dobo⁴, Mahesh Kumar Singh⁵, and
Ajay Kumar Singh⁶

THIS paper assesses the impacts of the global financial and economic crisis on the agro-food sector of Central and Eastern European, Caucasus and Central Asian countries on the basis of research conducted in Hungary, Ukraine, Armenia and Kyrgyzstan. It summarises the results of a study of which the objective was to propose policy options to the Food and Agriculture Organisation of the United Nations and other public authorities which can be applied to lessen the undesirable effects of the current or future crises in the sector. Results of interviews of stakeholders were analysed in the context of primary economic data and policy recommendations were formulated.

Key Words: *Financial and Economic Crisis, Agro-food Sector, Central and Eastern Europe, The Caucasus and Central Asia.*

Introduction

Among developing regions, Eastern Europe and Central Asia has been hit hardest by the global crisis. For several countries, a combination of international support, adjustment programmes, and perhaps even private sector debt restructuring will be needed to avoid large-scale defaults. Growth plummeted from 7.6% in 2007 to 4.7% in 2008, and was projected to be -5.6% in 2009 driven by a collapse in capital inflows, a sharp deterioration in terms of trade, and contraction in both domestic and external demands. The robust domestic demand that supported growth throughout 2007 and through the first three quarters of 2008 began to wane at the height of the crisis in September 2008. In several countries with data available for the first quarter of 2009, output deteriorated further on a year-on-year basis. Economic activity continued to shrink in Hungary (4.7%), Lithuania (13.6%) & Latvia (17.9%), while Romania and Russia recorded negative growth for the first time (6.4% and 9.4%, respectively). Poland, the only economy to show resilience, posted a GDP increase of 1%. See World Bank (2009) for a comprehensive overview of the financial and economic crises in the region.

This paper assesses the impacts of the global financial and economic crisis, hereinafter 'crisis', on the agro-food sector of Central and Eastern European, Caucasus and Central Asian countries on the basis of studies conducted in four representative countries, namely: Hungary, a central European country and a member of the European Union (EU) (Potori et al., 2011); Ukraine, a large eastern European

¹ Deputy Director General, Research Institute of Agricultural Economics (AKI), Budapest, Hungary and Professor and Vice Dean, Faculty of Applied Economics and Rural Development, University of Debrecen, Debrecen, Hungary.

² Head of Department & Director, Research Institute of Agricultural Economics (AKI), Budapest, Hungary

³ Research Scholar – Agricultural Policy Department, Research Institute of Agricultural Economics (AKI), Budapest, Hungary

⁴ Doctoral Student, Szent Istvan University, Godollo, Hungary.

⁵ Professor, Szent Istvan University, Godollo, Hungary and Director, Tata Consultancy Services.

⁶ Coordinador – MHROD, Department of Commerce, Delhi School of Economics, University of Delhi, Delhi, India and Hony. President – Governing Body - Society for Human Transformation and Research, Delhi School of Professional Studies and Research, (Approved by AICTE and affiliated to GGS Indraprastha University), India.

country occupying a strategic position between the EU and the Russian Federation (Artiushyn et al., 2011); Armenia, located in the Caucasus region on the border of eastern Europe and western Asia (Urutyanyan and Zohrabyan, 2011); and Kyrgyzstan, located in central Asia (Undeland et al., 2011).

The paper proposes policy options to the Food and Agriculture Organisation of the United Nations (FAO) and other public authorities (including those in countries represented in the study) which can be applied to lessen the undesirable effects of the current or future crises in the agro-food sector. As the data available to assess the impacts of the crisis on the sector in the region were limited, the research took the form of interviews of stakeholders in selected supply chains, the results of which were analysed in the context of primary economic data. The research also sought to gather useful country-specific, qualitative information on rural incomes, poverty and food insecurity/malnutrition, on exports and on other factors beyond the supply chain. Factors which were independent from the crisis (i.e., legal environment, weather, etc.) have also contributed to the state of the agro-food sector in every country. As far as possible, their impacts have been distinguished from those of the crisis. Although the results of the study are not necessarily applicable to all of the agro-food sectors and countries in the region, they are indicative of the present trends and thus provide an adequate basis for drawing conclusions and recommending policy options.

Methodology

The supply chains were selected as having a significant share in the country's production output, and/or of its trade. The fact that the choice of supply chains should facilitate the analysis of the impact of the crisis on poor farmers was also taken into account. Wheat was included as a commodity from all countries as it is a major crop which is widely traded internationally. The others were sunflower (produced at the small household level in Kyrgyzstan), grape/brandy (a revitalised sector in Armenia), pigmeat (an important traditional sector both in Hungary and Ukraine), and milk (an important element of the diet in Kyrgyzstan and a significantly increasing sector in Armenia).

The research focused on the effects of the economic downturn, indirect or direct credit constraints, trade and trade credit impacts on production and consumption. Credit issues included trade financing, payments, investments and foreign direct investment. Partly through the choice of supply chains and partly through the structure of the interviews, the impact of the crisis on poor farmers was taken into account. The overall research questions addressed in the study were therefore: (a) what are the key factors affected by the financial and economic downturn?; (b) to what degree have the key factors been affected?; (c) has the downturn affected different sectors or different parts of the supply chain in different ways?; and (d) what policy options can be recommended? To address these questions, a common framework was adopted for all interviews, as follows:

- What is the current state of the agro-food sector compared to three years ago (i.e., 2006)?
- What are the principal factors causing changes to the state of the agro-food sector?
- What strategies have businesses adopted to cope with these changes?
- How is the situation likely to change?
- Policy responses and recommendations.
- Other issues.

Interviews were conducted with representatives from all tiers of each supply chain. Besides agricultural producers, the impacts of the crisis were discussed with input suppliers, processors, integrators, traders, and retailers. Participants of the survey were major players in these supply chains with respect to market share, annual income, etc., and the interviewees were key informants who were able to provide an overview of the chain. The selection of interviewees was the responsibility of the country representatives, since they have the specific local knowledge, and preference was given to companies that are vertically integrated in the supply chain.

Representatives of banks and government officials were also interviewed in each country. The government sector covered those who are related to policy making and implementation, especially government officials, and also decision makers and/or government advisors. Some additional guidelines given to project partners were as follows:

- Farmers were to be representatives of business oriented entities.
- A small number of NGOs (e.g. farmers' organisations) may also be included (possibly one per sector), as may a representative of a consumer organisation.
- Banks can also include foreign investors and international donor money (if appropriate).

Results

The findings of the research were as follows.

Wheat and Sunflower Supply Chains (Four Countries)

The crisis had no significant impact on grain production in most countries in the 2008/09 crop year. Although it became more difficult to obtain money from the banks even if credit applications were approved, wheat farmers, in general, were still able to finance their businesses. But consecutive above-average world wheat crops in 2008/09 and 2009/10 boosted supplies while use was constrained by the slow-down in the global economy, deteriorating farmer confidence significantly in comparison with the first half of 2008. However, in most cases, this had more to do with the decline of producer prices or the general macroeconomic environment than with the crisis directly.

However, as farmers became less sure of their financial situation (partially due to the decrease of remittances in some countries) and the scant precipitation failed to support crop growth in most regions of Central Europe, Eastern Europe, and Central Asia during the last months of the 2008/09 crop year, sales volumes of all inputs, in particular of fertilisers and crop protection products, started going down. In most Central and Eastern European countries, the demand for agricultural machinery was noted to have dropped back significantly too. In some Central Asian countries, even the purchase of fuel for the harvesting and the following sowing season represented a problem.

Due to the limited selling opportunities and to the bearish wheat market outlook, arable farmers favoured further cost saving production technologies in the first half of the 2009/10 crop year. Grain producers began to look for cheaper seeds and agrochemicals and some changed their crop rotation to reduce the need for inputs. Land lease contracts were terminated, mostly on less fertile parcels in marginal areas. The aims at cost savings were not only reflected in the choice of technology but also in production decisions: in the autumn of 2009, winter wheat plantings declined in many of the Central and Eastern European and Central Asian countries.

Most market leading multinational input suppliers and traders use EUR or USD based credits provided by their parent companies with substantially lower interest rates than bank credits in national currencies. The increase in interest rates of parent company credits was described as insignificant during 2008 and 2009. As opposed to the multinationals, domestic input distributors, integrators, processors, and traders as well as arable farmers who sell their grain in the market largely depended on external credits. These stakeholders reported the review and modification of already approved credit applications, the re-evaluation of their collaterals, stricter credit conditions and increased credit charges in all countries. In general, banks prolonged the process of credit approvals, carried out more cautious risk analyses and shifted decision making to a higher level. Notwithstanding these changes in the procedures, credit applications were more often declined, even when the value of offered collaterals was several times above than that of the credit amount. The funds of some banks shrunk to such an extent that even their customers with high reputation and excellent credit history faced difficulties in accessing credits. Banks preferred not to finance grain inventories any more, and even refused public warehouse receipts as collateral (e.g., in Hungary).

The bulk of the individual wheat farmers tried to exist without credit. These market players usually took short-term loans from integrators to cover their variable costs but, due to the crisis, these external financial sources became more expensive too. Smallholders use financial lease and bank credits almost exclusively for implementing relatively large-scale investments (i.e., buying a new machine or constructing a new grain store, etc.). Integrators often claimed that, as a consequence of the increasing liquidity problems, low crop prices and weak demand, payments by farmers were overdue by far more than a month. Distributors became more careful about which producers to supply and put tough audit checks in place.

Increased foreign exchange risks represented a serious challenge for most businesses in the wheat supply chain of every country. Outside the EU, notably in Central Asian countries, input prices are often set and credits are often provided in USD, whereas the revenues of farmers and processors are in national currencies.

Vertically integrated enterprises with strong business ties and sufficient capital reserves were said to be less impacted by the financial and economic crisis. Agricultural holdings were also thought of as die-hards since their structure allows for expenses and financial flows to be optimised, and funds to be redistributed when necessary.

In both the Central and Eastern European and the Central Asian region, most stakeholders in the wheat supply chain postponed their investments. However, in the new EU member states, farmers and processors tried to complete their already running investment projects partially financed from EU funds, but within an extended time period, whenever it was possible. Despite the cold investment climate, to secure their future market positions, some of the large agricultural holdings in Ukraine were desperate to spend more especially on the development of their logistics (new river terminals, grain stores, etc.) while well managed bakery firms in Hungary pursued product development and strengthened their marketing efforts. Large and financially sound enterprises were expected to carry out acquisitions of the weaker ones with attractive regional sales markets, raw materials base, storage facilities, etc.

Due to their liquidity problems, processors preferred to buy grains and flour on a daily basis and held smaller stocks, thereby trying to transfer the cost of storage on to stakeholders upstream. To reduce costs, many input suppliers and processors shortened working weeks, sent workers on paid or even unpaid leave, or cut wages. The major agrochemical factories in Ukraine were reported to operate at only half capacity. More attention was paid to energy use and outdated machinery was disposed of whenever it was possible. Millers and bakers turned towards cheaper low quality raw materials such as feed wheat. As a consequence, the quality of most bakery products, in particular of bread in the low price segment declined significantly, especially in Ukraine.

While large processors had to cut production, many of the smaller ones were forced to close their businesses¹. Due to the financial and economic downturn, the unfavourable macroeconomic and legal environment, many tried to avoid paying taxes and social contributions (e.g., in Hungary). Processors faced extra difficulties in countries still in transition where the importers of raw materials are few and have a strong bargaining power (e.g., in Armenia), because the decrease in world market prices were not transmitted entirely. Mills in Ukraine tried to limit the increased risks in the flour business by pursuing other, mostly unrelated business activities which are good examples of diversification.

As regards grain trading, in 2009, the prompt buying of grains became dominant, while forward contractors preferred deliveries in 3-6 months rather than 6-12 months as before. This made markets more nervous and greatly increased price volatility. Many of the foreign buyers aimed to cover their needs from their domestic markets as much as possible, thereby minimising grain imports. Large grain importers in some countries, also within the EU, became more sensitive to

swings in the foreign exchange rates and cancelled tenders more often than before. This made the organising of logistics very difficult for exporters. In addition, business trust between farmers and traders weakened considerably. With the creditability of buyers declining, and due to their liquidity problems, most suppliers demanded pre-payment or other guarantees. Banks and thus traders too turned their attention from country risk to individual company risk. Regarding risk management, traders, in general, aimed to reduce credit risk on clients, to secure payment conditions and to use credit insurance whenever possible. Traders experienced difficulties in obtaining credit to cover the cost of their stocks, therefore, in most countries, only limited quantities of grain were procured in the 2009/10 crop year, and these could be stored for only a short time. Not only were grain prices low but, due to their increased fluctuations, and also because of the exchange rate volatility, banks valued grain inventories of traders considerably below their futures markets quotations.

Although traders, due to weakened bargaining position of farmers and integrators, were quite often referred to as winners in the crisis situation, opportunist grain dealers, whose number increased in recent years when prices were high, were expected by professional market players to go out of business as they were less able to pay to producers and finance inventories even at low prices. This was thought to be beneficial for most of the stakeholders because transaction costs may decline; however, many individual arable farmers could suffer from being cut off from their main source of financing. Indeed, in some countries (e.g., Armenia) buyers' payments were several months overdue.

In Ukraine, local authorities can set limits of profitability for production of lean-formula bread (flour, yeast, salt, and water) weighing over 500 gm as well as limits of trade mark-ups to the wholesale price of that bread's producer. About 50% of bread made in Ukraine is subject to such regulation.

Grape/brandy Supply Chain (Armenia)

Farmers were generally affected by the higher prices of inputs. Those who were able to market their products, stated that prices were much lower in 2009 compared to 2008. However, there were many farmers who were not able to sell because of the limited demand by processors. Moreover, the processors often failed to make timely payments and farmers needed to obtain loans to continue farming and the availability of these was limited by the banks. Hence, most of the farmers used up all their personal funds living at a subsistence level.

Due to the crisis, processors and traders were affected by an approximately 30-50% decline in the sales volume of cognac and other processed goods. All the grape processors over 90% of their were sold production outside of Armenia, particularly to Russia, hence the decline in sales volume was mainly a result of reduced foreign demand. On the one hand, the AMD depreciation helped most of the grape processors as a large portion of their products was exported. On the other, many processors stated that their costs increased due to high raw material prices, high inventory costs and expensive credit. Many small companies which were not major players went out of business or were on the verge of bankruptcy, while the big players in the market were surviving with hope. The outlook for the sector as a whole was uncertain and largely dependent on the global economic situation. The long term outlook for those that survived the crisis was good, however, because of the vanished small-scale competitors from the market.

Pigmeat Supply Chain (Hungary and Ukraine)

Although the pre-crisis situation of the pig breeding sector was different in Hungary and in Ukraine the perception of the crisis was similar and at most points in the chain the impact has been somewhat less so far than most stakeholders expected. In Hungary a significant increase in pig prices, 14% in the first half of 2009, and the demand driven market put producers in a favourable position. The compound feed price dropped by 24% and energy prices by 7%. Even though veterinary products are partly imported, as in Ukraine, producers paid only 8% more for them at the start of

2009 than a year previously. The input suppliers interviewed had not noticed a big decrease in the domestic demand for their products but they did note astonishing price volatility and an unpredictable income situation. The perceived problem was the solvency of some domestic buyers, apparently because the banks were not financing production. On the other hand, expensive or lacking financial sources did not allow suppliers to finance producers as before. Their response to the crisis was not to supply customers who were considered to be a risk, as well as cost-cutting.

In Ukraine the situation was slightly different. Input suppliers to the pig breeding sector, producers of compound feed and suppliers of veterinary preparations found themselves in a difficult position. Before the crisis, their services were used mainly by small pork producers and households. Large pig-breeding complexes had their own veterinary units and compound feed plants. However, the sudden devaluation of the UAH slashed demand from small pork producers in early 2009. This concerned both veterinary preparations, which are almost completely imported, and mixed feeds that include valuable imported components and additives (minerals and vitamins, proteins, and amino acids). A move by small entities away from mixed feeds to simple grain in pig raising made feed plants alter their recipes towards lower costs and poorer quality. However, even those products did not secure much increase in demand. As a result, feed plants curtailed production, shut down, cut staff or moved workers to part-time work, and reoriented towards production of feed for poultry.

Hungarian pig farmers were expecting serious consequences when the economic-financial crisis developed but in fact seasonality, i.e., the classical pig cycle, had a stronger impact than the crisis. There was a significant deficit in the market and feed prices had declined, resulting in higher prices and higher margins for pig farmers in the first three quarters of 2009. Though prices were at an acceptable level, buyers began to delay their payments, thereby weakening the liquidity of pig farmers towards input suppliers who were requiring prompt payments. In order to avoid using credit, some farmers extensified their production and owed more to input suppliers. Concerning streamlining of operations and cost cutting in production, adjustments in such a short time were not possible for pig farmers. However, on the input side salaries were frozen and people were laid off. The feeding of on-farm produced grain and scraps became more common. Whenever possible farmers preferred cash transactions because money transfers had been delayed. Investments were postponed, even EU regulated compulsory investments for manure storing and handling, which are the conditions of future operation. Those who were not capable of financing these investments were expected to quit farming in 2009. The pig stock in June 2009 was 14% less than a year earlier, 10% less enterprises and 20% less individual farms were holding pigs than in the previous year. By contrast, the number of pigs raised by private households was thought to have increased. Those who endure believed if the necessary investments can be completed, their competitive disadvantages will not become greater. There were worries that stakeholders operating illegally would benefit from the crisis. Interviewees were not aware of any specific government policy measures which had been taken in response to the crisis.

Livestock changed in the opposite way in Ukraine. The pig population as of 1st October 2009 had increased by 8.0% over the previous year, to 7.462 million. The growth of pork output by Ukrainian agricultural producers was promoted by a considerable decrease in meat imports due to the dramatic devaluation of the UAH. Besides, controls on meat smuggling were rather tough. As a result, imported pork, which created competition in the domestic market, decreased. This secured a growth in meat prices and a higher demand for meat produced by domestic manufacturers. Despite the decline in people's purchasing power, pork prices in Ukraine remained high: as of 1st October 2009, the purchase price of pigs in live weight was 10-15% higher than 12 months earlier. A drop in demand in early 2009 was temporary and was rather easily survived by most producers, especially agro-holdings. The profitability of pig farming was minus 27-20% in 2007-2008 whilst in 2009, positive profitability (2-4%) was forecasted for the entire branch. Agricultural enterprises and complexes could increase their pig population in Ukraine, as of 1st October 2009 the number was 17.4% greater to the same date last year. Rural households also reacted flexibly. Cheap feeds

encouraged pig population growth in household backyards. As of 1st September 2009 the pig population in households had increased by 1.6% compared to the same period of 2008.

The crisis impacted the supply of raw materials for Hungarian processing. Processors reported that not only the pig market but also the entire meat sector was in a better and more stable situation than the crisis would suggest. It seemed that the consumption of basic food did not decrease to the same extent as of other products, therefore, the drop in consumption had a smaller effect on producer prices. The supply of live slaughtering pigs had been decreasing in Europe independently of the crisis, and prices jumped from HUF 240 to 330 HUF per kg in the year to August 2009. The peak producer price was unrealistic, and in the Hungarian pig market live-pig imports started to increase again in the second half of 2009.

The vast majority of processors agreed that retailers' private label products undoubtedly benefited from the changes in consumer behaviour (consumers had become even more price sensitive). In the retail chains, the share of private label products was growing, and was thought to have reached 60% of the total sales. Although it was recognised that banks have had to re-evaluate credits, none of the processing companies in the survey had been significantly affected, but they consider that they had good credit histories. Some processors who were already struggling before the crisis failed at the end of 2008. Retailers tried to delay payments a bit more often. Processors cut back on spending where possible, but invested in improving efficiency. They laid off some employees but recognised that if they were to expand production in the future, it could be extremely difficult to find skilled and experienced work force on the labour market. The increase in the rate of VAT was to the advantage of the illegal market players in the food supply chain. Processors and traders also claimed that in Hungary the retail sector was in favour of the financial crisis because they had a stronger negotiating position with the suppliers.

Due to the decline in people's income and aggravation of the economic situation in Ukraine, meat demand and consumption in 2009 declined by about 5-10%. Additionally a sharp shift towards less expensive poultry meat occurred. An especially acute diminution in demand for meat was seen in the first ten months of 2009 which caused a decline in pork output. By the middle of the year, people adapted themselves to the new conditions, and the demand for pork slightly increased. Processing enterprises found themselves in a somewhat worse position relative to pork producers. First of all, demand for products in more expensive and more profitable segments had dropped. On the other hand, meat products in the low-price segment and, to a considerably lesser extent, in the medium-price segment, became highly sought after in 2009. The devaluation of the UAH, together with higher energy prices, resulted in a considerable increase of costs of meat product output (almost 50% of raw meat and all ingredients such as spices, additives, casing, etc., for sausage production were imported). However, processing enterprises could not adequately increase prices of their products since a change of prices of cheap meat products was subject to endorsement by the State Price Inspectorate (c.f. also wheat). As a result, the profitability of processing enterprises fell to a minimum. According to managers of processing enterprises, most pork producers supplied pigs for processing only against prepayment, while retailers delayed payments for meat products sold.

In response to the crisis, suppliers tended to replace quality meat with cheap chicken products, and reduced support personnel. Their product range also changed. For example, the output of prepared meat products decreased by 30% (because people cook much more foodstuffs at home). According to estimates by Ukrmyaso National Association of Meat and Meat Product Makers, up to 50% of meat-processing enterprises were expected to be shut down in 2009 because of shortage of finance. Small and medium-sized enterprises facing a lack of floating assets could be especially affected.

Milk Supply Chain (Armenia and Kyrgyzstan)

The dairy supply chain was largely impacted by the crisis. Dairy farmers and processors were affected by higher input prices, and declining demand in both local and international markets. The

price of milk and dairy products at the retail chains did not drop as compared to 2008, while the procurement price for milk from farmers went down at least two times. Interviewees claimed that to alleviate the adverse affects of the crisis, no significant policy measures were introduced.

In Armenia, the crisis had perhaps the most impact on agricultural producers. Most of the dairy farmers operated at a loss. The price of milk declined by about 20% relative to 2008, and there was still a large surplus in the market. It was not only the case that farmers were paid less for milk, but payments were delayed by up to three months. Farmers looked for alternatives to make a profit from their cattle, thus most of the remaining cows were held rather for the production of calves. This was more cost efficient and farmers hoped to profit more from meat than from milk. Without any government support dairy farmers were thought to give up production in large numbers, threatening the whole dairy supply chain which has strategic importance in the country.

In Kyrgyzstan, smallholders, who produce the bulk of the milk and who generally own two or three cows, complained about the price of milk falling two times in 2008-2009, and that even direct sales at local markets were often unprofitable. Whilst there may be regional differences, households generally consume about 40% of their milk production and sell the remaining 60% (during the summer). During the winter, with yields falling heavily, most households consume all their own milk. The sector employs some 1,400 workers, principally in a number of large dairy farms around Chui Oblast, which supply 80% of exports. These large farms were also impacted by the crisis.

Although the milk prices declined in Armenia compared to last year, some of the processors, being socially responsible, purchased milk at higher prices than the competitors. Many milk processors stated that their cost increased due to the high cost of utilities, raw material prices, and interest rates. In addition, the raw material prices increased in AMD as a result of the 3rd March exchange rate policy. The major investment most of the interviewed firms consider was the acquisition of modern technology that was energy efficient, and will cut utility costs. On top of all the problems already threatening the operations of processing firms, actions by government were not matched with what is needed under the current crisis situation. However, they were optimistic about the future.

There are more than 390 dairy processing enterprises in Kyrgyzstan but the sector was dominated by several medium and large enterprises. These companies processed 85-88% of the milk which came onto the market, and the remaining share is processed through small local companies. Generally, in the past few years, the output of the dairy industry had been decreasing. Exports of milk decreased in 2008 in comparison to 2006 almost six times. The stakeholders most affected by the global financial and economic crisis were thought to be dairy farmers. Traders and processors also experienced problems but their losses were partly covered by farmers.

The demand for Armenian dairy products on the export markets decreased. Russia, the main export destination of Armenian dairy products, was highly impacted by the crisis. The restriction of dairy products shipped to Russia through Georgia as a consequence of the recent war created additional problems for Armenian dairy exporters. Dairy products had to be transported either through Iran or by air which increased transport costs significantly.

Retailing (Four Countries)

As a consequence of the crisis, consumer purchasing power declined drastically in many countries in the region. This is illustrated by the example of Tesco Global Kft. in Hungary where FMCG (fast moving consumer goods) sales dropped by 12% year on year in November 2009². In Ukraine, one out of every five retail chains, including giants like Velyka Kyshenya, had to close their less profitable stores as a consequence of increasing accounts payable, growing energy prices, rents and credit charges, and dearer utility services³. On the other hand, most of the discount chains (e.g. Ukrainian Retail, ATB-Market, etc.), targeting consumers with average or below average

income levels, and some of the large multinational retail chains, offering a wide choice of private label products or pursuing an aggressive expansion policy, were able to strengthen their market positions. *Nota bene*: retail chains targeting high income level consumers, such as Yeritsyans and Sons in Armenia, were less impacted by the economic downturn, because the preferences of the social strata they provide service for changed little. In Armenia, the demand for flour decreased by 20-30%.

Price is the most important factor in the purchasing decisions of consumers, and it became even more so in the crisis. Thus, in general, the crisis impacted first the demand of goods/brands which can easily be substituted by less expensive alternatives. Many food products belong to this category and, in general, consumers at least in Central and Eastern Europe are believed to be less loyal to brands than their Western European counterparts. For these reasons, and also because competition was very tough due to the presence of many retail chains in some of the countries, the choice of relatively cheap food products increased, and special price offers became more frequent. Consequently, suppliers of low priced mass products had to deliver greater volumes while others needed to change their production structure. The demand for private label products increased considerably, and these will definitely have a larger share of turnover in the future. It was also underlined that, due to the crisis, consumers were spending less on high value added processed goods, while the demand for basic foods (e.g. flour, sugar, many lower value added bakery products, fruits, and vegetables) remained rather stable.

Quite often, the calls for tenders by multinational retail chains for the production of private label food products are international. Experience in Central and Eastern Europe showed that suppliers in Poland and the Czech Republic were less affected by the crisis than in Hungary or Slovakia, where the impacts were more severe either due to the macroeconomic instability, or to the introduction of the euro. Retailers claimed that contract terms and conditions with suppliers did not alter, and stakeholders were expecting no major changes in front and back margins in the near future. It was pointed out that in some sectors, production and processing had long been facing difficulties, and thus, the decline of production and sales was only partly due to the crisis.

In some countries, protectionist and even nationalist rhetoric has inevitably gained some popularity. For example in Hungary, to increase the proportion of domestically produced goods on the shelves of retail chains, and to regulate contract conditions, a new Ethical Codex was drafted by the Ministry of Agriculture and NGOs, and signed by most of the stakeholders. However, the initiative did not prove to be effective, and thus, remained a mere symbolic step towards farmers, and the processing industries battered inter alia by the crisis, mainly because the Codex failed to provide a clear definition of 'domestically produced' goods. (It was also heavily criticised by the Hungarian Competition Authority). Notwithstanding the failure of efforts like this, the preference of domestic goods by consumers increased in 2009, mainly due to the devaluation of the national currencies. This trend was observed in Hungary as well as in Ukraine.

In many countries (including Hungary, Ukraine, Armenia, Kyrgyzstan), the direct marketing of agricultural goods increased substantially. This was particularly true for milk and basic dairy products, in which case the declining purchasing power of the consumer, and the oversupply on the dairy market shortened the distribution chain, especially in rural areas. Another development has been a reversal in the decline in the number of pigs kept by rural households as part of a move towards greater economic self-sufficiency, and this has negatively impacted on retail sales.

Banks and Lending Institutions (Four Countries)

Owing to the varying degrees of integration into the world economy of the four countries in the study, the different ownership profile of the banks, and the contrasting fiscal approaches of national governments, in this section developments in the four countries are reviewed separately.

Banks in Hungary tended to lower their credit/deposit ratio. They looked more carefully at the total credit portfolios of enterprises, and required a much higher share of own sources (at least 10-15% for the financing of 20-25% of a project), even when an investment was supported from EU funds. The placing of investment credits declined by 5-10%. The total debt of the agribusiness sector had dropped by around 5-10% by mid-2009, but started to increase again in August. Credit conditions were made tougher and the maximum amount of credit per hectare land was cut from HUF about 100,000 (EUR 374) to HUF 70,000 (EUR 262). Credit costs increased markedly, by 2.0-2.2% to 12-14 %. With the devaluation of the HUF, there was an increase in loan defaults, especially with those in foreign currencies (e.g., CHF). Banks cleared their portfolios and lowered their operational costs by quitting their less profitable activities and cutting their staff. Many did not take on new customers but they were not worrying about the crisis radiating to the agro-food sector. According to the interviewees, small enterprises will be excluded from credit granting in the future. Banks reckoned the market environment would be unpredictable for the next 2-3 years, thus the returns on most investments could be judged as rather dubious.

Ukrainian banks and other financial institutions became hostages of a credit boom in foreign currency in 2006-2008. UAH devaluation caused failure to repay loans by many bank clients. This in turn led to banks in many cases not being able to return deposits. As a result, in late 2008 a moratorium on deposit refund obligations was introduced. Despite this measure, a number of banks went bankrupt. In 2009, banks provided UAH 3.3 billion (EUR 0.3 billion) worth of new loans to agrarian sector enterprises. Interest rates on bank loans increased to 16.5-30.0% (including loans for agricultural enterprises). The number of banks willing to grant credit to the agrarian sector decreased, and the ones who still provided such loans demanded more rigid conditions. Due to the crisis, many agrarian sector borrowers faced debt servicing problems. According to the Ministry of Agrarian Policy of Ukraine, more than 3,400 applications on loan restructuring, amounting to almost UAH 12 billion (EUR 1 billion), had arrived from agrarian sector enterprises as of late summer 2009. Although bank revenues grew by 41.9% in the first eight months of 2009 compared to the same period of 2008, their expenditure increased by 88.9%. As of 1 September 2009, losses of Ukrainian banks amounted to UAH 20.5 billion (EUR 1.7 billion), whereas the same period in 2008 saw a profit of UAH 6.9 billion (EUR 0.6 billion). Of Ukraine's 15 largest banks, only seven showed a profit in the third quarter of 2009.

The crisis reached Armenia through the real economy instead of the financial markets. Even so, all interviewed banks and lending institutions claimed that credit was less accessible than pre-crisis. In fact, most banks in Armenia stopped providing consumer credit. Banks tried to deal with increased default risk by raising interest rates, applying stricter conditions to potential debtors, and giving preference to short-term loans. Although the number of depositors decreased, most banks were able to provide more loans to agri-businesses because the government provided funds specifically for the sector at a lower interest rate. In March 2009, the introduction of the floating exchange rate depreciated the AMD by about 20%. Although Armenian law prohibits it, banks provided credit mainly in USD, and required loan payments in either USD or AMD equivalent. Therefore, many debtors had difficulties in making payments. There were also other discrepancies between the law and practice: banks provided the designated government loans to the agricultural sector at much higher interest rates. Although market conditions were tougher, the basic market structure remained unaltered. However, banks expect changes in the sector within a year or two, when big banks can resume their planned investments, potentially acquiring smaller banks.

Interviewed banking institutions in Kyrgyzstan cited the devaluation of the national currency, increase in the inflation rate, low rate of transfers from nationals living abroad as well as repayment of credit to financing institutions as major problems for the sector. In response to these, banks toughened their deposit policy, and raised credit rates. The latter were increased to 22% for agricultural activities, and to 27% for processing and other sectors in 2008. Credit conditions were also tightened: while previously only credit history was deemed relevant, clients had to go through

The Central Collateral Registration Office if the amount of a loan exceeded KGS 30,000 (EUR 450). An important measure to help agriculture was to provide subsidised loans for farmers through banks. The interest rate of these loans was 22%, but if a farmer repaid the credit in time he received a 10% interest compensation. Credit was given in KGS in order to avoid exchange rate risk.

The Government Sector (Four Countries)

Governments in the four countries adopted different approaches for mitigating the effects of the crises in the agro-food sector. In Hungary, membership of the EU limited the space for manoeuvre, Ukraine introduced some short-term measures, Armenia was very exposed to external factors whilst the Kyrgyz government thought that the country may be less exposed to the crisis. In most, if not all countries the communication of the existence of these measures to the supply chains was an issue.

Officials in Hungary shared the view that the financial and economic crisis impacted the agro-food sector significantly; however, to a lesser extent (at least in the first half of 2009) than some other sectors of the national economy. The negative effects of the crisis had been amplified by the inflexibility of the decision making and administration system of the EU, and the inefficiency and the weak communication of the national administration. Although most of the stakeholders appeared to be unaware of any agro-food sector specific action taken by the government in response to the financial and economic crisis, the list of the policy measures aimed to lessen the negative effects included guarantees for agricultural investments via the government-owned Hungarian Development Bank; advance payments to enterprises for which investment support from the EU Rural Development funds had been granted; working capital loan programmes for cereal producers and dairy farmers; abolition of milk quality analysis fees; additional coupled payments to dairy and cattle farmers tobacco farmers, and fruit and vegetable producers from 2010; aid to wineries for the distillation of excess wine stocks; earlier payment of EU direct support; and lower VAT on bakery and dairy products. On the other hand, the budget for cofinancing EU direct payments was cut in 2009, with a further cut due in 2010.

Agriculture in Ukraine was without any productive support until March 2009 when a law, inter alia, encouraging banks to roll over loans to agricultural producers came into force. To increase demand for grain, in late 2009 the government formed a financial pool used by the Agrarian Fund (a state organisation supervised by the Ministry of Agrarian Policy) to accomplish intervention purchases of grain, and established a Stabilising Anti-crisis Fund. All the measures were mainly short-term: producers obtained a financial resource at the Agrarian Fund's expense to secure current agricultural works, money from the Stabilising Fund went to subsidise compensation of bank loans for agricultural producers, cattle-breeding, agricultural machinery leasing, implementation of some investment projects, and partial reimbursement of expenses incurred for sowing of spring crops.

The government in Armenia set up several programmes intended to intensify the support to producers of agricultural products although, in late 2009 the level of financing from the state budget was less than 40% of the projected level. They included seed development, plant protection, agricultural animal vaccination, state support to agricultural land users, provision of agricultural animals by the government on different payment terms, credit to agricultural enterprises and small-scale agricultural traders, credit for the economic development of rural areas, and requirement for dairy producers to include the proportion of milk powder and natural milk in the labels (to encourage consumer selection of natural products). The Armenian government is perceived to have neglected the sector in its policy making over a period of years, even although it publically stresses the importance of agriculture. The Ministry of Agriculture expressed intentions of helping the sector overcome the crisis, but the government appeared to favour the residential construction sector.

In Kyrgyzstan, the government initially announced that the global crisis would hit the economy.

Later, it judged that since the country was not fully integrated into the global economy, it would not be hurt significantly. However, several actions were adopted to mitigate the impact of the crisis, and ensure food security including a new Law on Food Security, several resolutions on socio-economic development, discussions with Russia and Kazakhstan on waiving quarantine on import of dairy products, and the Ministry of Agriculture initiated VAT exemption from home based processing of dairy products. Additional credit resources were provided to Aiy Bank (former Agricultural Financial Corporation, recently established as a bank) for lending to farmers, and the state Agro-Prod Corporation (a state joint stock company set up in 2008 to regulate prices for wheat through market activities) bought wheat directly from farmers to offset their credits. However, interviewees in the supply chain claimed not to have noticed any significant support. For example, the wheat procurement mechanisms were not clear and transparent, whilst AgroProd Corporation is becoming a dominant player in the wheat sector, and is pushing small and medium size mills out of the market.

Discussion and Policy Recommendations

The relationship between the crisis, and other issues affecting agriculture and food security is clear. The first Millennium Development Goal states that the United Nations “is to eradicate extreme hunger and poverty” and “agricultural productivity is likely to play a key role in this if it is to be reached on time”. David Nabarro, coordinator of the UN secretary-general’s task force on the global food security crisis, stated that the economic crisis further “complicates and exacerbates the situation ... price volatility and a global credit crunch are discouraging new planting and new investment, while food prices in many poor countries remain at historically high levels” (EurActive, 2009). Thus, in formulating policy options, the financial crisis must be considered in the overall context of food security and poverty. We note that governments are claiming to give high priority to stabilise the macroeconomic and legal environment. However, Philippe Le Houerou, whilst recognising that the financing needs in Emerging Europe and Central Asia are the highest of any region of the world, recently stated that “as the impact of the stimulus packages dissipate at the global level, the private sector will need to take over as the engine of economic recovery and growth” (ECA, 2009).

By contrast, given the entrenched nature of global poverty, the arrival of peak oil, and the evidence that climate change will have a major impact upon food provision in the long term, there is growing concern that the world food crisis will deepen over the next decade (Lawrence et al., 2009). Thus when the most immediate effects of the financial crisis have passed, these issues will still remain to be addressed through government and trans-national interventions. Recommendations relating to these wider issues are beyond the scope of this report, but it should be stressed that it is necessary to avoid short-term policy responses which conflict with long-term development goals.

On the basis of the foregoing, we have sought to identify what steps governments could take, in addition to stabilising the macroeconomic and legal environment, in order to make the agro-food sector less exposed to future financial crises. It is not our place to offer recommendations to governments on how to lower interest rates, to modify the tax system or how to crack down on illegal operations although these issues were regularly raised by interviewees. However, governments need to agree on common goals in order to be better prepared for future shocks to the global food system, such as another financial crisis, and to devise coherent policies to achieve them, to monitor progress, to identify best practices and to draw up contingency plans.

In all four countries, several measures have already been implemented but many interviewees were not aware of, or did not perceive, their existence. When they did, they frequently criticised them as being ineffective or incorrectly targeted. Equally, many stakeholders, with the exception of multinationals, called for measures such as more subsidies, more state intervention including price controls, more protectionist measures, and even the creation of state owned monopolies, which we understand (as

they arise from each respondent's particular vision of the situation and his/her perception of possible political solutions) but cannot support. They are examples of the short-term policy responses which can have negative impacts of rural poverty. Where governments do intervene in the market, they must ensure that they minimise the risk of causing market distortions.

A deteriorating economic situation may encourage protectionism and, for example, to delay the implementation of legislation and other efforts geared towards environmental sustainability. Any price movement due to the increased volatility of the market should not be interpreted as a trend, but may encourage protectionist responses amongst governments. Protectionist measures are not a way out of the crisis situation, and are not able to avert the occurrence of crises in the future.

Similarly, state intervention, especially in pricing agricultural commodities, and state owned monopolies can discriminate against rural areas. Governments often keep prices of basic grain at such artificially low levels that semi-subsistence producers cannot accumulate enough capital to make investments to improve their production, and are effectively prevented from getting out of their precarious situation. When a government monopolises trade, farmers may find that they are free to grow cash crops for export but, under penalty of law, are only able to sell their crops to government buyers at prices far below the world market price. The government then is free to sell the crop on the world market at full price, pocketing the difference. This creates an artificial "poverty trap", from which even the most hard-working and motivated farmers may not escape (EurActive, 2009).

Governments should distinguish between agro-economic priorities and social policy issues. Our recommendations focus on the establishment of resilient, economically viable, diverse, innovative agro-food chains which are capable of meeting changing market needs such as consumer desire for safe, healthy foods, perhaps coupled with issues such as lower environmental impact farming and improved animal welfare. In the longer term, rising food prices, and an efficient and productive agro-food chain, the latter encouraged into existence in part by effective government measures, could, as envisaged by David Nabarro, help rural communities in some countries in the region to escape poverty by increasing farmers' incomes. We recognise that governments need to enhance social security safety nets to combat the consequences of developments such as, the reduction in remittances and the return home of migrant workers, but as a quite separate issue.

The recommendations, based on the frequent observation of interviewees that companies with adequate financial reserves for 1-2 years are not suffering from the crisis, and the ideas in the country reports, are as follows:

1. Target the limited funds for investment subsidies at the professional viable enterprises with a long-term business plan. Increased investments have been a major driving force behind the recent economic growth in the agro-food industry. However, as national budgets tighten, there will be implications for agricultural spending. The economic downturn may add further impetus for policymakers to re-evaluate the uses to which agricultural expenditure is put, and to re-focus it where it might provide the greatest level of benefit.
2. Support initiatives which can ensure more reliable access to credit. Access to credit was viewed as the key issue by many interviewees, and the problem was compounded by a reduction in asset values which reduced stakeholders' capacity to borrow money. We agree that governments were right to avoid direct crediting to agricultural producers and processors in terms of loans, rather to use banks as the means of increasing financing for the agro-food sector. To maximise reliable access to credit, initiatives may include expanded credit guarantee funds and support for credit insurance in order to improve the financial circulation within the agro-food supply chains. Other possibilities include credit warrants, credit unions, cooperative banks, microcredit, an insurance system against natural disasters and better information about the availability of credit.

3. Avoid the offsetting of debts, taxes and other liabilities. Offsetting of debts etc., is never applied to the general population, and the implementation of such measures in response to the financial crisis would further weaken business trust, and increase political and legal risks perceived by stakeholders, would nurture corruption and weaken social integrity.
4. Improve technology. Many parts of the agro-food supply chain in the region are undercapitalised. This can lead directly to production losses. For example, many wheat farmers in Armenia ascribe around 15% crop loss to worn-out machinery. The greatest technical challenge to avoid soaring food prices is to develop and introduce more productivity increasing (or at least stabilising) farming technologies that are sustainable. New technology can increase gross value added (GVA) throughout the supply chain, ensure compliance with Health and Safety, and other regulations, as well as allow new market opportunities to be exploited through new products. Government cofinancing should take into account not just the needs of the beneficiary but also the potential impact of the investment on the wider local economy.
5. Encourage horizontal and vertical integration along the agro-food supply chains in order to facilitate cooperation between stakeholders, to strengthen business relations and restore business trust, to reduce transaction costs and to increase bargaining power. The means for achieving this include changes to the legal environment, preferential taxation, co-financing aid for investments, state guarantees, etc.
6. Encourage consolidation, rationalisation and specialisation, particularly but not only within the processing industries, in order to create viable market players which can competitively supply retailers with respect both to quantity and quality of products. In addition to full-scale mergers, farm associations, grain procurement cooperatives and export groups can strengthen the negotiating positions of their members through collective purchasing and selling. Capacity building measures are needed to help their establishment, plus changes to the legal environment and co-financing aid. Less formal cooperation could include the setting up of representative farmers' associations whose members could benefit from shared services. Such cooperation could be encouraged with tax incentives.
7. Increase spend on innovation and R+D. All tiers in the supply chain must continue to innovate both in terms of new products and production systems to maintain their economic viability, and to access new markets. Whilst such innovation can often be led by the private sector, substantial investment in public sector agricultural research and development is also required, particularly in developing countries. Technological support to farmers and other stakeholders, including advisory services, and effective animal and plant breeding programmes can help to strengthen the entire agro-food industry. Measures to promote information and technology transfer, particularly from the public to the private sector, are a crucial but frequently neglected component of this process.
8. Support marketing activities to strengthen the market position of the domestic processing industries. Tax simplification could encourage new entrepreneurs into the market.
9. Support the development of logistics to lessen the costs of handling, storing and transporting goods and thereby increase the competitiveness of the supply chain.
10. Provide risk management subsidies to farmers to help them to cope with increasing price volatilities. Governments should encourage the use of derivative market instruments such as commodity futures and option contracts, for example to manage the price risks which have increased due to the volatility of the markets. Before this happens, they should ensure that stakeholders have more information about the use of these instruments, and also create an environment where market participants can accumulate the necessary capital to cover the costs of using such instruments, and where regional commodity futures markets could perhaps emerge which would be able to attract liquidity (contract volume).

11. Improve the transparency of policy making and communication in order to restore government credibility. The process could be facilitated by involving NGOs in the decision making process. The trading environment for all stakeholders in the supply chain would be encouraged by more helpful public administration, respect for existing laws by public officials and other stakeholders, and transparency in government and government measures. Investors should not be faced with unnecessary political risks through unnecessary government intervention. Measures aimed increasing quality standards for imports and exports, and stronger food safety regulations in general are to be welcomed, but such regulations should not simply be a 'front' for trade barriers.
12. Facilitate the gathering, processing and disseminating of market information, and create reliable and accessible databases, thereby making shorter and more efficient decision making, and adjusting process of enterprises. Improved market information services will help stakeholders to respond more quickly and effectively to any future crises, and could possibly be delivered through greater use of ICT.
13. Facilitate niche markets for speciality products. The consumer shift to cheaper products has clearly benefited own label brands, and may have strengthened the position of the major retailers, who can call on strong negotiating positions and economies of scale, in the agro-food chain. However, some stakeholders have already responded to the crisis by exploiting 'niche' market opportunities. Support for producing goods with 'added value', bearing in mind the longer-term trend towards safe, healthy foods mentioned above, may help smaller players in the supply chain to exploit new business opportunities.
14. Make more effort to educate consumers and children about agriculture, nutrition and kitchen culture. Whilst it might seem inappropriate to look beyond the issues of poverty and basic food security at a time when these are increasing, the gradual 'westernisation' of the diet has attendant health issues such as obesity. Healthy eating, including the greater consumption of so-called 'functional foods' can have both social (e.g. greater life expectancy) and economic (a healthier workforce) benefits.
15. Promote land reform. The process of land reform and land registration needs to be completed as secure tenure of farm plots is essential to allow farmers to invest with confidence in machinery and other equipment and if necessary to use the land as collateral in return for credit. Achieving this objective requires:
 - establishing a uniform state land cadastre in each country where this does not yet exist, and creating a uniform state system of registration of titles for immovable property including for land plots
 - creating conditions for development of mortgage lending on the security of land
 - providing conditions for free purchase and sale of agricultural land plots
16. Support liberalisation of the land market. Several countries are amending their national laws to encourage the purchase or lease of farmland abroad, or to attract foreign land investors. In our research, interviewees in different countries held conflicting views on liberalisation, particularly with respect to foreign ownership. Gana (2009) stated that "Land rights alienation to foreign companies represents a major threat for farm and rural households (and) will increase the actuality and relevance of issues such as land rights, tenure systems, land reforms, land conflicts and struggles". We do not agree that it is a "major threat". Liberalisation can provide access to investment capital which can revitalise the economic performance of primary agricultural production which in turn is the basis of agro-food supply chains which can employ large numbers of people and contribute considerable GVA to the economy. Hence we support liberalisation of the land market implemented by each government in the form most appropriate to local conditions.

J. Popp, N. Potori, R.G. Garay, Erika Dobo, Mahesh Kumar Singh, and Ajay Kumar Singh

The key messages arising from the research are (a) the need to create prosperous, vertically and horizontally integrated agro-food supply chains which are more resilient to future financial crises, and (b) to ensure more reliable access to credit. Our recommendations, while focusing on these issues, only address what to do, not how to do it. Inevitably their implementation would need to be adapted to fit with local needs and further research is needed regarding this. Such research should be conducted in the international sphere to allow cross-border identification and exchange of good practice. The FAO is uniquely well placed to drive forward this research agenda.

Footnotes

- 1 As for the sunflower sector in Kyrgyzstan, where processing is extremely fragmented about 60% of the oil mills had been closed within 18 months since 2008.
- 2 Food product sales represent about 70% of the turnover of Tesco in Hungary. According to CSO data, the total food and non-food turnover of the retail sector in Hungary was 3.5% lower year on year in the first half of 2009.
- 3 According to SSCU data, the total turnover of the retail sector and the restaurant business declined by almost 20% year on year to UAH 144.6 billion during January-August 2009.

References

- Artiushyn, V., Kobets, M., Pugachov, M. and Sikachyna, O. (2011), Impacts of the Global Financial and Economic Crisis upon the Agro-industrial Sector of Ukraine's Economy, Economics and Rural Development, Research Papers, Vol. 7, No. 1 (in press).
- ECA (2009), ECA Economic Update Press Briefing Opening Remarks: Philippe Le Houerou, Available online at <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:22338419~pagePK:34370~piPK:42770~theSitePK:4607,00.html>. Accessed 14 December 2009.
- EurActive (2009), Europe and global food security. EurActive Network Policy Summary, Available online at <http://www.euractiv.com/en/cap/europe-global-food-security/article-179097>, Accessed 10 December 2009.
- Gana, A. (2008), Food Crises, Land Grab and Farm Offshore Production: The Re-emergence of the Land question, In: Abstracts of Presentations Made at ESRS 2009, Available online at <http://www.esrs2009.fi/pdf/rc40.pdf>, Accessed 20 October 2009.
- Lawrence, G., Burch, D., and Almas, R. (2009), Food Security in a Globalised World: A Critical Assessment, In: Abstracts of Presentations Made at ESRS 2009, Available online at <http://www.esrs2009.fi/pdf/rc40.pdf>, Accessed 20 October 2009.
- Potori, N., Garay, R., and Popp, J. (2010), Lessons Learned from the Impacts of the Global Financial and Economic Crisis on the Agro-food Sector of Hungary, Economics and Rural Development, Research Papers, Vol. 6, No. 2, pp.7-16.
- Potori, N., Fieldsend, A.F., Garay, R., Popp, J., and Udovecz, G. (2011), The Impacts of the Global Financial and Economic Crisis on the Agro-food Sector of Central and Eastern European and Central Asian Countries, Studies in Agricultural Economics, Vol. 113, pp.5-32.
- Undeland, A., Shapakov, K., Kochonova, A., Berrada Gouzi, A. and Tabaldieva, J. (2010), An Assessment of the Impacts of the Global Financial and Economic Crisis on the Agro-food Sector of Kyrgyzstan, Economics and Rural Development, Research Papers, Vol. 6, No. 2, pp.24-34.
- Urutyan, V. and Zohrabyan, T. (2011), Impacts of the Global Financial and Economic Crisis on the Agro-food Sector: Evidence from Armenia, Economics and Rural Development, Research Papers, Vol. 7, No. 1 (in press).
- World Bank (2009a). Global Development Finance: Charting a Global Recovery. Part 1. Review, Analysis, and Outlook. The International Bank for Reconstruction and Development / The World Bank. 167 pp. eISBN: 978-0-8213-7841-0. Available online at http://siteresources.worldbank.org/INTGDF2009/Resources/gdf_combined_web.pdf, Accessed 24 June 2009.