Innovative agricultural finance and risk management
Strengthening food production and trade in the transition region
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WORKING PAPER  
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ACRONYMS

ADB  Asian Development Bank  
ACBA  Agricultural Cooperative Bank of Armenia  
AGLED  Agricultural, Livestock and Enterprise Development  
ANBIMA  Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais  
BBM  Bolsa Brasileira de Mercadorias  
BIP  Base Insurance Product  
BM&F  Bolsa de Valores, Mercandarias & Futuros  
BMC  Mercantile Exchange of Colombia  
BNA  National Agricultural Exchange  
CAP  Common Agricultural Policy  
CARD  Center for Agribusiness and Rural Development  
CDCA  Certificates of Agribusiness Credit Rights  
CDM  Certificado de Depósito de Mercancías; Certificate of Deposit  
CFC  Common Fund for Commodities  
CIDA  Canadian International Development Agency  
CIDT  Compagnie Ivoirienne pour le Développement des Textiles  
CIS  Commonwealth of Independent States  
CME  Chicago Mercantile Exchange  
CPR  Cédula de Produto Rural  
DCA  Development Credit Authority  
DRP  Disaster Response Product  
EBRD  European Bank for Reconstruction and Development  
EC  European Commission  
ECA  Eastern Europe and Central Asia  
EPA  Export Prepayment Agreement  
ESU  European Size Unit  
EU  European Union  
EWR  Electronic Warehouse Receipt  
FCC  Food Contract Corporation  
FIDC  Fundo de Investimento em Direitos Creditórios  
FMC  Farm Management Company  
FSU  Former Soviet Union  
GCC  Government Catastrophic Coverage  
GDP  Gross Domestic Product  
ha  Hectare  
IFAD  International Fund for Agricultural Development  
IFC  International Finance Corporation
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<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>ITFC</td>
<td>Islamic Trade Finance Corporation</td>
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<tr>
<td>L/C</td>
<td>Letter of Credit</td>
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<td>LIIP</td>
<td>Livestock Insurance Indemnity Pool</td>
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<td>LRI</td>
<td>Livestock Risk Insurance</td>
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<tr>
<td>LSA</td>
<td>Livelihood Service Adviser</td>
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<td>LSP</td>
<td>Livelihood Service Provider</td>
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<td>MCC</td>
<td>Millennium Challenge Corporation</td>
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<td>MFI</td>
<td>Microfinance Institution</td>
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<td>MICEX</td>
<td>Moscow Interbank Currency Exchange</td>
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<td>NAMEX</td>
<td>National Agricultural Mercantile Exchange</td>
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<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>PPP</td>
<td>Purchasing Power Parity</td>
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<td>SAS</td>
<td>SugdAgroServ</td>
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<td>SECO</td>
<td>Swiss Secretariat for Economic Affairs</td>
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<td>SGM</td>
<td>Standard Gross Margin</td>
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<td>SME</td>
<td>Small and Medium-Sized Enterprises</td>
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<td>SPV</td>
<td>Special Purpose Vehicle</td>
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<td>TAFF</td>
<td>Tajik Agricultural Finance Framework</td>
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<td>TFP</td>
<td>Trade Facilitation Program</td>
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<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>USDA</td>
<td>United States Department of Agriculture</td>
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<tr>
<td>VAT</td>
<td>Value Added Tax</td>
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<td>WA</td>
<td>Warrant Agropecuário</td>
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<td>WHR</td>
<td>Warehouse Receipt</td>
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This report was prepared by the Investment Centre Division of the Food and Agricultural Organization of the United Nations (FAO) at the request of the European Bank for Reconstruction and Development (EBRD), under the cooperation between the two institutions. It was financed by EBRD’s Special Shareholders Fund and FAO. Its main author is Lamon Rutten, Agriculture Finance Expert, who worked under the overall guidance of Frank Hollinger, Rural Finance Specialist, FAO, and Heike Harmgart, Senior Economist, EBRD. The report also benefited from useful comments and suggestions by Peter Bryde, Deputy Director, Agribusiness, EBRD; Emmanuel Hidier, Senior Economist, FAO; and Hannah Levinger, Economic Analyst, EBRD.
Ensuring that food production keeps up with population and income growth, changing dietary patterns and climate conditions in the decades to come is but one of the challenges currently facing developing and advanced countries around the globe. The world’s population is expected to stabilize at around 9.1 billion people in 2050, a 30 percent increase from current numbers, but demand for food will grow by 70 percent. To keep up with the pace of demand growth, yields need to improve drastically, yet there is little scope to expand acreage. Transition countries, some of which face food security problems of their own, can play an important role in achieving global food security as yields can be improved. Countries such as Kazakhstan, the Russian Federation and Ukraine, which have been net grain importers up to the late 1980s, can emerge as the world’s leading grain exporters.

In order to meet rising food demand, significant investment from the private sector will be required in these transition countries. Such investment needs to be catalysed through supportive policy and regulatory, legal and institutional frameworks. International financial institutions, in turn, can facilitate the creation of these frameworks in transition country governments. This paper focuses on one particularly important action area: how can various agricultural finance and risk management products, mechanisms and institutions that are relatively new to the transition region, enhance the region’s food production, processing and trading systems? These products, mechanisms and institutions include: market-based price risk management, weather index insurance, structured finance and other innovative forms of finance, warehouse receipt (WHR) systems and commodity exchanges. The paper aims to identify how international financial institutions such as the European Bank for Reconstruction and Development (EBRD) can most effectively leverage their investments and technical assistance programmes to boost the adoption and scaling-up of such products, mechanisms and institutions.

**Transition countries’ diverse agricultural systems**

There is a broad span of agricultural sector structures in transition countries and, to a large extent, optimal solutions are country-specific. Nevertheless, for the purpose of analysis, it is useful to group transition countries into three broad categories:

- **Group A**: current and aspiring European Union (EU) members;
- **Group B**: large economies of the Commonwealth of Independent States (CIS); and
- **Group C**: small, relatively poor economies with a large commodity sector.

The group of current and aspiring EU members is fairly diverse, generally with a high per capita gross domestic product (GDP) and a diversified economy. As in other transition countries, the dismantling of state controls and liberalization of input supply, marketing and credit provision seriously disrupted agriculture. In some countries, smallholder producers came to dominate agricultural production. In others, large farming corporates emerged as a major mode of production. In many countries, strong value chains were created with agricultural processors and, to some extent,
trading companies providing inputs to farmers on credit and buying their crops. Agriculture in large economies like Azerbaijan, Belarus, Kazakhstan, the Russian Federation and the Ukraine went through a major crisis after the break-up of the Soviet Union. Many agricultural subsidies disappeared, input prices increased sharply and marketing systems collapsed. Many farms became unprofitable, millions of hectares (ha) were taken out of cultivation and production fell precipitously. The five countries affected responded differently to the crisis. In Azerbaijan, most state-owned land was distributed for free or at very small cost to rural residents, including farm members, resulting in a smallholder farming structure. In Belarus, very little changed, except for the conversion of a number of collective farms into corporate entities. In Kazakhstan, the Russian Federation and Ukraine, the agricultural sector was restructured starting in the late 1990s. This restructuring ultimately resulted in a system where individual farm households operate alongside huge farming enterprises, some of which are owned or operated by international firms or funds. The former often specialized in high-value crops and livestock; the latter, in grains and oilseeds.

In the final group, composed of the low-income transition countries, a very large part of the population is employed in agriculture. During the 1990s, most countries in this group saw widespread liberalization and a radical restructuring of land ownership. A few, however, retained a strong measure of government control, particularly on the cultivation and trade of export commodities. Foreign investment in agriculture in these countries remains low, and the infrastructure for agricultural production, trade and finance, weak.

**Dealing with agricultural sector risk**

Farmers, processors and traders in transition countries are exposed to the same kind of risks that are prevalent in agriculture everywhere, in particular weather risks, price risks (both for inputs and crops), political risks and risks related to poor support infrastructure. Even if exposed to such risks, farmers may face incentives to trade off insurance, and consequently reduced risk, against likely short-term gains. In the event of loss, absence of insurance not only hurts current income and consumption but also investment and hence future income and growth.

In some transition countries, farmers and processors have a level of coverage against such risks. The different safety net and support programmes of the EU were extended to the new EU member states, and EU support programmes helped to create similar safety nets in aspiring EU countries. Large, relatively rich countries like Kazakhstan, the Russian Federation and Ukraine were able to maintain heavily subsidized crop insurance programmes. But in the larger number of low-income former Soviet Republics, as well as Mongolia, governments could not afford such largesse, and farmers were mostly left to their own devices.

Market-based instruments can provide alternatives to subsidized insurance programmes. For example, index-based weather insurance instruments provide an alternative solution at lower operating cost, avoiding many of the transaction costs and moral hazard risks inherent in multi-peril crop insurance. The insurance would initiate a payout to the insured party such as the farmer when an index reaches a certain trigger level. Indexes could, for example, represent rainfall during certain days, maximum daytime or night-time temperature or livestock mortality. The payout
is not based on the specific loss that the insured party suffered, but on a specified weather event; for example, rainfall as measured by a nearby weather station. While this method may be far from perfect – it may have rained where the weather station is located, but not on the farmer’s fields, for instance – it is cheap to administer and payments can be made very soon after the weather event occurs.

Progress with the introduction of weather risk index insurance in the region has been weak to date. While Mongolia successfully adopted such insurance for its livestock producers, a pilot project in Ukraine failed. Lack of progress is largely due to existing institutional and technical bottlenecks including an insufficiently dense network of professionally managed weather stations; insufficient data on past production and weather patterns; absent technical expertise for designing and pricing weather index products; improper insurance regulations; and difficulties in linking weather index insurance and agricultural finance. Technical assistance can help address these bottlenecks. It can also help create affordable and reliable mechanisms to distribute weather index insurance over intended beneficiaries, particularly by bundling it with other products such as microfinance or input supply. New technologies such as the use of mobile phones to collect premiums and affect payouts can support such efforts. Demand for index insurance is high in many countries, and in some countries the financial sector is sufficiently developed to successfully test new approaches.

Price risk can also be managed through the use of market-based instruments. In new and aspiring EU member countries as well as for sectors such as cotton and dairy this management has taken the form of fixed forward prices offered within agricultural value chains. In many cases, the buyer not only commits to fixed-price purchases at a certain time in the future, but also to provide inputs, extension services and finance. Certain crops, such as those that pass through natural “constriction points” like centralized processing plants, are particularly well suited for the value chain approach in price risk management. In countries where value chains are not yet well organized (i.e. most of the low-income transition countries), international agencies can be catalysts for their development.

For other crops, like grains, which do not have such natural constriction points, fixed-price forward contracts carry large contract default risks. In these cases, futures and options provide better price risk management tools. However, agricultural futures and options are still poorly developed in transition countries. Despite efforts undertaken by many countries, there are no functioning, liquid agricultural futures contracts in the region. At the same time, the use of the leading global grain and oilseeds futures market, the Chicago Mercantile Exchange (CME), is challenging, not only because the logistics of using an overseas exchange can be cumbersome, but also because local prices in transition countries do not necessarily move in tandem with CME prices.

### Improving commodity exchanges and warehouse receipt systems in transition countries

There are many commodity exchanges in transition countries. Two out of three countries have at least one exchange, but most have little organizational and financial strength and play an insignificant role in their economies. The total size of commodity futures trade in the region is very small. But while agricultural contracts are of little significance for most of the large exchanges, there is good scope for growth, either through national contracts or through regional initiatives. For example, the role of the large CIS countries such as Kazakhstan, the Russian Federation and Ukraine in world
grain and oilseed trade has developed to such a level that successful Black Sea grain and oilseed futures contracts attract avid international interest.

One of the key characteristics of functioning commodity exchanges is that they create a bridge between futures and physical markets. For this link to work, a certain legal, financial and technical infrastructure is needed. WHR systems allow collateralization of agricultural output, and hence borrowing against it. With these systems in place, producers can physically deposit their output after the harvest in licensed warehouses and present the receipt to a financial intermediary as security. The stored grain serves as collateral, giving farmers access to seasonal finance. In addition, WHR systems reduce agency and information costs from intertemporal contracts. The storage option allows farmers to wait for market prices to improve before selling their output after the harvest, thus preventing market saturation and stabilising prices. WHR systems form a strong link between the physical grain sector and “paper” trade in fungible grain contracts. Efficient WHR systems not only boost the chances for successful local futures contracts, but also offer new post-harvest financing opportunities.

A number of WHR projects have been started by international agencies with EBRD taking the lead. These projects have been by and large successful, but there is still considerable scope for improvement. Local banks generally remain unwilling to explore the possibilities of WHR finance, inter alia because of ongoing and often justified concerns about the reliability of local warehouse operators. Legal and regulatory reforms frequently stall. Warehouse operators are not keen to contribute to fidelity funds. Some projects were oriented at replicating western WHR systems, such as that of the United States of America, but were insufficiently adjusted to the specific conditions of emerging market commodity sectors; hence, they failed to recognize the possibilities to leapfrog by adopting new technologies such as electronic warehouse receipts (EWR). There has been an overemphasis on the creation of a legal and regulatory framework while much less attention has been paid to supporting concrete operations solutions on the ground. These include collateral management/credit support, which is the vehicle for most WHR finance in emerging economies, and value chain finance.

Developing successful exchanges is a challenging task and many constraints are yet to be addressed in transition countries. The legal and regulatory framework is often ambiguous, incomplete or even counterproductive:

- The rules governing investment in exchanges may hinder exchange development by limiting the maximum permitted individual shareholdings, or by defining exchanges as not-for-profit enterprises, for example.
- Exchanges may not be fully empowered to self-regulate their operations. For example, the decisions of their arbitration panels may be difficult to enforce or can easily be overturned by a court of law.
- It may be difficult to operate an efficient delivery mechanism. In some transition countries, efforts to create a strong link between futures and physical markets were undermined by the absence of strong WHR regulation and a proper grading system, and the concentration of warehouse ownership.

To move forward with commodity exchange and WHR projects in the region, the following suggestions could replace traditional approaches:
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• First, look at potential deals and structure them around legal constraints, then work to improve the legal and regulatory framework for WHR finance.
• Promote innovation towards the development of a secondary market of tradeable WHR instruments.
• Consider instruments beyond agricultural futures and options, which target the needs of physical trade and/or finance such as repo contracts or project bonds. Then, work with potential partners to introduce instruments one by one.
• Make full use of available technology to develop cost-effective approaches, tailored for transition countries.
• Make EWR systems the basis of WHR projects, and use this technology to attract new participants to the sector.

Moving beyond warehouse receipt finance

WHR finance is just one of the many tools to provide larger financing at better conditions to participants in agricultural value chains in transition economies. EBRD, International Finance Corporation (IFC) and other development agencies have, in different ways, been supporting the financial capacity of local banks and non-bank financing institutions to lend to entities in the agricultural sector, both for short-term and longer-term purposes. These programmes are useful. They build on and strengthen the capability of local banks to finance small projects, with a likely catalytic impact on the target sectors. But there is room for broadening their scope and enhancing their influence.

In particular, most of these programmes now focus on teaching bankers how to identify and quantify risk. However, credit scoring does not eliminate the risks associated with external factors such as price developments or weather events, not to mention those related to government policies or commercial counterparts. Empowering banks not just to quantify, but, more importantly, to manage such risk using a variety of structured finance tools is critical to enhancing their capacity to lend to agriculture. A broad condition for successful lending is that agriculture – or, at least, the supply chains that a financier targets – is profitable from farm to fork, from producer to final buyer. Banks should be taught how to build loans around the strength of the transaction structure which they themselves can also reinforce rather than on the strength of prospective borrowers.

This approach is advisable not just for conventional banking, but also for microfinance. Microfinance programmes exist throughout the transition region, generally run by non-governmental organizations (NGOs). They tend to rely on a combination of credit scoring, group guarantees, and assessment of business plans. International experience shows, instead, that the microfinancier can directly address the borrowers’ main problems: unmanaged risk, low productivity and unfavorable terms in input and output market transactions. New product offerings such as weather insurance, veterinary and extension services, capacity-building programmes for farmers’ groups, support to contract farming schemes and price information can systematically mitigate these problems, and thus positively impact the ability of borrowers to reimburse loans.

In this agenda, financiers will be helped if credit support institutions can be strengthened. There are many transaction structures where a bank is best off relying on a third party because the required skills are specialized, and an additional level of
checks and balances is in place. International organizations may consider setting aside a part of the funds that they wish to provide to local banks to develop credit support institutions, such as logistics agents and collateral managers.

Furthermore, banks work best if they are part of a more complete financial environment, ideally operating alongside investment funds of various stripes as well as a multi-asset exchange where they can refinance themselves and recalibrate their risk exposure. International organizations should consider how they can support proposals from private sector groups to form agricultural investment funds and trading platforms to complement their ongoing commitments to local banks.

While copying a structure from one commodity sector to another or from one country to another may not work in all cases, structures that do work well in particular settings should provide inspiration to others. Globally, as well as in the transition countries, one can find many examples of deal structures that, if properly adapted, may work well in certain transition countries and can provide practical solutions to the financing needs of commodity producers, processors and traders. Given that international banks tend to concentrate on large-scale transactions and that many of the financing needs in the agricultural sector are below their usual threshold, it falls largely on local and regional banks in transition countries to learn from international experience to structure financing solutions for their own regions.

Globally, there is a wealth of experience with innovative agricultural finance that can inspire financiers in transition countries. This knowledge ranges from Australia’s experience with agricultural project bonds to China’s linking of agricultural finance and hedging; from Brazil’s rural bonds issued by farmers giving rise to a whole range of secondary capital market instruments to repo contracts traded on Colombia’s commodity exchange. International organizations can bring these practices and related expertise to the region.

In transition countries, experience with structured commodity finance has not always been positive. Structured commodity and trade finance is considered a low risk area by financiers. Thus, it is particularly suited to borrowers in higher-risk environments, provided that the financing structures are competently engineered. This has not always been the case, however, and in several instances when this competence has been absent, financiers found that their structures failed because of an incomplete management of risks. In particular, insufficient attention was paid to creating the necessary incentives for the various participants in value chains to continue performing optimally.

The scope for expanding structured finance is probably most limited in the transition countries that have become EU members, where lending risks, both real and perceived, have declined, and the need for tight financing structures is reduced. Aspiring members are going through the same process. Banks in these countries are now, to a large extent, owned by western European and, to a lesser extent, American banks, and these should not be prime targets for international support. Legal and regulatory conditions have also improved considerably, and are included as part of the EU accession process. Major companies have built up track records, which now give them access to balance sheet finance. Finally, there have been many western European investments in the agricultural and agro-processing sectors in these countries so that, by and large, agriculture has become well organized.
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The large economies of Kazakhstan, the Russian Federation and Ukraine have many large structured finance deals, mostly on the back of major export flows. The legal and regulatory framework is favourable, though not yet perfect. Several banks in the region have reasonable experience with various forms of structured finance for agricultural commodities. By the early 2000s, some of the banks had developed reasonable in-house capacity that they used to initiate their own transactions. EBRD’s programmes to promote WHR finance and, to a lesser extent, its trade facilitation programmes have been effective in promoting such forms of structured finance. However, those bankers who became knowledgeable in structured finance focused on the large oil, metal and grain sectors. Fewer efforts have been made to target less traditional sectors. Targeted support could help change this trend. A good starting point would be to focus on integrated commodity chains and non-traditional sectors.

The economies of Armenia, Georgia, Kyrgyzstan, Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan are small and vulnerable. They pose a sub-investment grade risk to international lenders. The financial sector is underdeveloped, with few large local banks and virtually no international ones. Local interest rates are high. Agricultural production is fragmented, with very few large farms. Governments have often retained strong control over agricultural sectors seen as strategic, and many rules and regulations such as those on exports hinder their proper development. The infrastructure for physical trade, including warehouses and grading laboratories, is deficient. The legal and regulatory regime is weak and corruption is rife. Practices in commodity trade are unsatisfactory, with contract defaults a common occurrence. There is a lack of trust among the various players in the commodity sector. All these factors complicate commodity finance. Structuring techniques can help mitigate the risks, but possible deal sizes are, in general, too small to be of much interest to international banks, while local banks do not have the required expertise. The international community could provide support for specific sectors, such as cotton, milk or poultry.

Conclusion

Governments and international agencies can broaden and deepen the agricultural finance and risk management approaches developed both in the region and globally. Approaches that have demonstrated success in some transition countries and some sectors may be extended to other countries and sectors. And it is possible to adapt related experiences from other parts of the world. Possible actions can be divided in three areas: institution-building, developing instruments, and legal and regulatory improvement.

There is vast scope of institution-building in transition countries, focusing on organized trading platforms that can link agricultural trade, finance and risk management; on “chain integrators” that enable goods to flow efficiently in agricultural value chains; and on the capability of banks to originate and manage innovative agricultural financing transactions. The EBRD and other international financial institutions can support each in a distinct way. For example, trading platforms, in the form of commodity exchanges or EWR systems, should be designed as vehicles for innovation. In transition countries, innovation is likely to be needed not just in price risk management and counterparty risk management, but also in finance, including repos, products based on Cédula de Produto Rural (CPRs) and bonds for commodity projects. More could
be done to strengthen local banks’ understanding of the commodity sector and of structured finance tools, and even of simple tools like factoring and leasing. A good starting point would be to do “value chain audits,” which identify support entities that can form constriction points in the chain (i.e. commodities are likely to pass through these entities) and which, when properly organized, can form the anchor for structured financing. This starting point can be followed by the development of blueprints for financing different sectors.

Innovation in instruments depends, in part, on institutional innovation. Trading platforms are vehicles for innovative instruments. With an EWR system, capital market investors can directly invest in stocks of physical commodities. Repo finance becomes possible. On exchanges, project bonds for agricultural projects can be listed. A weather index derivatives contract can be introduced, which will facilitate the growth of the weather risk management market. Nevertheless, designing appropriate instruments can be complex, and the result does not benefit from copyright protection; successful innovators can be easily copied. Hence, there is a good argument for public support of the development of new instruments. Instruments that merit special attention include index insurance, in particular, for weather risk; repo contracts, as traded on the Colombian agricultural futures market; capital market instruments, such as Brazil’s CPRs; and project bonds, as traded in Australia, which can permit new, professional managers to become engaged in agriculture.

Governments need to create a policy, legal and regulatory framework that enables efficient use of modern financial instruments. For commodity exchanges, this framework includes the absence of negative actions such as unpredictable interventions in markets, and the provision of a supportive framework in terms of grading and quality control, contract enforcement, taxation, etc. If governments want to improve finance along the supply chain, they have to take into account the legal environment with respect to ownership rights, enforceability of contracts, bankruptcy and the transferability of WHRs, contracts and export licenses. While this work area should not be the main thrust of their programmes, donor agencies should support government efforts. If governments are not engaged in this development, then the focus of donors should be on making specific transaction structures possible. This should be the focus because certain groups will benefit and are, therefore, likely to support it; and because, following the transaction support, the readily identifiable benefits will help overcome government reticence to support modern financial instruments. In addition, given the mistrust of markets that still prevails among certain policy makers, an advocacy role of the international community remains warranted.
World population is expected to grow from 7 billion in 2012 to 9.1 billion in 2050, a 30 percent increase. Food demand will grow faster because of accelerated urbanization and richer populations, and to meet this demand, food production has to increase by about 70 percent. This increase involves an extra production of 200 million tonnes of meat and 1 billion tonnes of cereals (the equivalent of the current world production of wheat plus the production of maize in the United States of America).

FAO estimates that 90 percent of the necessary production increases will have to come from increases in yield and cropping intensity, and the remaining 10 percent from the expansion of arable land. The transition region can play a significant role in meeting the global challenge. CIS countries have 13 percent of global arable land, but grow only 6 percent of global crops and farm only 2.6 percent of global meat. Contrary to the rest of the world, yields in transition countries have stagnated since the 1970s. Estimates are that yields in the transition region could be increased by 75 percent within a decade, and an additional 40 to 60 million ha of extra land could be brought into production. To realize this potential, however, requires an investment of over USD 75 billion in upstream agriculture, of which two thirds would have to come from the private sector.

In order for such private investments to be mobilized, policy, legal and regulatory conditions must be favourable, and a conducive institutional environment needs to be in place with respect to agricultural production, trade, finance and risk management. This paper sets out to discuss one part of this equation: how various agricultural finance and risk management products, mechanisms and institutions that are relatively new to the transition region (e.g. market-based price risk management, index insurance, structured finance and other innovative forms of finance, WHF systems, commodity exchanges, etc.) can enhance the region’s food production, processing and trading systems, resulting in better food security in the region and an enhanced contribution to global food security. In doing so, it aims to identify how the EBRD can effectively leverage its investments and technical assistance programmes to boost the adoption and scaling-up of such products, mechanisms and institutions.

Chapter 1 starts with a broad description of the agricultural sector in transition economies, describing changes in farm structures that occurred over the past two decades, and discussing the rise of international farm investment in the region. It also discusses how innovative instruments fit within these different structures, using the example of how input finance has evolved post-liberalization and how it could be further enhanced.

Chapter 2 describes agricultural risk exposure, and the market instruments that permit the management of such risks, with a particular focus on market-based instruments for managing weather and price risk. The conditions for the development of these market-based instruments are described, and experience in the region is analysed, with a case study of the less-than-successful introduction of weather index insurance in Ukraine as an illustration.

Chapter 3 discusses two important institutions that can anchor the sustainable growth of agriculture in transition countries, namely,

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1 Other aspects, not covered in this paper, include land tenure issues, public/private investments in infrastructure, land acquisition policies, research and extension, domestic and regional food security concerns, international trade policy issues, adjustment of production systems to high energy costs and climate change-related risks and opportunities.

2 As defined by EBRD, and categorized for the purpose of this study, as follows:
   • Current and aspiring EU members: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Estonia, the Former Yugoslav Republic of Macedonia, Hungary, Latvia, Lithuania, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Turkey.
   • Large economies: Azerbaijan, Belarus, Kazakhstan, the Russian Federation and Ukraine; and
   • Small, relatively poor economies with a large commodity sector: Armenia, Georgia, Kyrgyzstan, Mongolia, Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan.
commodity exchanges and WHR systems. It describes the current situation with respect to both, and suggests possible ways to enhance their roles in the region, including making greater use of technology such as EWR systems and regional exchange initiatives, and by boosting certain new approaches like collateral management.

Chapter 4 describes how various financing approaches and instruments have been used in transition economies to bring loans to the agri-value chain, with a particular focus on the past and potential role of international organizations. Annex 14 illustrates, using the example of Armenia, the broad range of international support to agricultural finance. The chapter starts with a discussion of the various international support programmes to enhance the agricultural lending capacity of local banks. It then discusses possibilities and experience with pre-harvest finance, including leasing, and post-harvest finance. It also summarizes experiences in other parts of the world like Brazil and Colombia, and discusses lessons that can be learned from other regions in terms of replicating experiences within the transition region. The annexes contain longer case studies.

The concluding chapter summarizes programmes and projects that EBRD and, by inference, other international financial institutions, may wish to consider in order to improve the use of “new” agricultural finance and risk management products. It is hoped that these conclusions and the preceding discussions will also be useful for national governments and the private sector.

The annexes provide tables illustrating the volatility of production and prices in the region, an overview of the commodity exchanges operating in the region, discussions on some of the technical aspects of WHR finance and structured commodity finance and a series of case studies, including experiences with innovative finance in other parts of the world.
Chapter 1: How innovation in agricultural finance and risk management can enhance food production, processing and trade in the transition region

1.1 Agriculture in transition economies – a brief overview

There is a broad span of agricultural sector structures in transition countries. Table 1 gives an overview of countries’ population levels, the prevalence of poverty, per capita GDP, and the percentage of the labor force active in agriculture as compared to the share of agriculture in GDP. To facilitate discussion, in several sections of this paper transition countries are grouped into three broad categories:

Group A: current and aspiring EU members;
Group B: large economies of the CIS; and
Group C: small, relatively poor economies with a large commodity sector.

1.1.1 Farm structures in current and aspiring EU members

The group of current and aspiring EU members is fairly diverse, generally with a high per capita GDP and a diversified economy. Some of the countries of the former Yugoslavia, which have been ravaged by war, are an exception. The agriculture and finance sectors of many of these countries have already become integrated with those of the EU, and others will follow.

The structure of the agricultural sector in most of these countries has gone through a major change over the past two decades. As of the early 1990s, only in Poland, Turkey and the former Yugoslavia was farming centred around individual households. In other countries, the Soviet model prevailed: most land was cultivated collectively, on cooperative and state farms measuring thousands of hectares. Only a small percentage of the land was cultivated by individual households, who nevertheless supplied up to one fifth of total food production. Marketing channels and prices for both inputs and crops were controlled by the state. Agricultural credits were channelled through administrative instructions, and the under-pricing of inputs was often the vehicle for considerable government subsidies.

In the countries where the Soviet model had a longer-lasting impact, the dismantling of state controls and liberalization of input supply, marketing and credit provision seriously disrupted agriculture. The general response was two-pronged. On the private sector side, agricultural processors and, to some extent, trading companies often stepped into the shoes of the former government agencies, providing inputs to farmers on credit and buying their crops; foreign investments in agriculture and agro-processing facilitated this process. On the government side, a radical reorganization of agriculture was initiated, with land divided among individual households – both farm workers and former land owners who received restitution or compensation for earlier nationalization. Some of the new owners became smallholder farmers as in Latvia and Lithuania, but others in the Czech Republic, Slovakia, Estonia and, to a lesser extent, Bulgaria and Hungary, soon started renting out their land to

### Table 1
Countries with economies in transition – some key data

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (million, July 2011 est.)</th>
<th>% of population below poverty line (2008 or latest year)</th>
<th>GDP/capita (USD purchasing power parity (PPP), 2010 est.)</th>
<th>Share of agriculture in GDP (%)</th>
<th>% of labor force in agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albania</td>
<td>3.0</td>
<td>12.5</td>
<td>8 000</td>
<td>18.9</td>
<td>478</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>4.6</td>
<td>18.6</td>
<td>6 600</td>
<td>6.5</td>
<td>20.5</td>
</tr>
</tbody>
</table>
large-scale cooperative or corporate farms. In all of these countries, many cooperative and state farms were not disbanded, but reformed into corporate farms.

Table 2 gives an overview of the farm structure that has resulted in the respective countries. In Bulgaria and Slovakia, a small number of large farms, with an “economic size” of more than EUR 120 000, control more than half of total farmland, and Hungary and Estonia follow not far behind. Farms in these countries can be considered corporate farms. In contrast, in Latvia, Lithuania, Romania and Slovenia, small farms control more than half of farmland; in Poland, this number is 48 percent. With an “economic size” of less than EUR 9 600 and with no or only a small surplus available for sale, these farms can be considered smallholder or semi-subsistence farms.

Farms with an economic size (i.e. estimated gross margin) of less than one European size unit (ESU) are often not classified as farms at all, rather, they are plots of land farmed by households as a secondary activity. If one excludes these “microfarms” and only...
Innovative agricultural finance and risk management considers farming households with an ESU of more than one, then it is worth noting that in all of these countries, the vast majority of farms (the lowest number is 78 percent, in Poland), have an economic size of less than EUR 9,600. Most of these farms mainly produce for self-consumption. Mid-sized farms, many of which are commercially-oriented family farms, account for 15–21 percent of the total number of farms in Estonia, Hungary, Poland, Slovenia and the Slovakia, but are generally less than 10 percent in the other countries.

1.1.2 Farm structures in large economies
Azerbaijan, Belarus, Kazakhstan, the Russian Federation and Ukraine are geographically large countries, with relatively high per capita GDP; (Ukraine has the lowest, at USD 6,700). These countries have an agriculture sector that may still employ a large part of the population, but that has become small in terms of its contribution to GDP.

In Soviet times, farming in these countries was dominated by large collective and state farms. These coexisted with small household plots (of about 0.4 ha) which were largely subsistence-oriented, and specialized in vegetables, fruits and livestock. In the process of land reform of the 1990s, the household plots were made much larger by land allocations from the state, new commercially-oriented family farms were created and many of the collective and state farms were reorganized. The ownership of the land was transferred to workers and pensioners, but the farms continued to be operated as a whole. But the process of reform was not smooth. As in other former Soviet Union (FSU) countries, many agricultural subsidies disappeared and input prices increased sharply. Many farms became unprofitable, millions of hectares were taken out of cultivation, and production fell precipitously during the 1990s. However, yields and acreage expanded again in the 2000s. Combined with a large fall in local livestock production, and hence much less use of locally produced grains and oilseeds for cattle feeding, the result was that Kazakhstan, the Russian Federation and Ukraine emerged as major grain and oilseeds exporters.

The details of the process of land reform differs between countries. In Azerbaijan, most state-owned land was distributed for free or at very small cost to rural residents, including farm members, resulting in a smallholder farming structure. In Belarus very little changed, except that collective farms were converted into corporate entities. In Kazakhstan, the Russian Federation and Ukraine, starting in the late 1990s, huge farming enterprises were created, at times

<p>| Table 2 |
| Farm structure in Eastern Europe, 2007 |
|&lt; 1 ESU | 1-2 ESU | 2-8 ESU | 8-100 ESU | &gt;100 ESU |</p>
<table>
<thead>
<tr>
<th>Farms (%)</th>
<th>Area (%)</th>
<th>Farms (%)</th>
<th>Area (%)</th>
<th>Farms (%)</th>
<th>Area (%)</th>
<th>Farms (%)</th>
<th>Area (%)</th>
<th>Farms (%)</th>
<th>Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>76</td>
<td>6</td>
<td>13</td>
<td>4</td>
<td>9</td>
<td>7</td>
<td>2</td>
<td>28</td>
<td>0.3</td>
</tr>
<tr>
<td>Estonia</td>
<td>46</td>
<td>6</td>
<td>23</td>
<td>7</td>
<td>21</td>
<td>14</td>
<td>9</td>
<td>35</td>
<td>1.4</td>
</tr>
<tr>
<td>Latvia</td>
<td>59</td>
<td>21</td>
<td>20</td>
<td>11</td>
<td>16</td>
<td>21</td>
<td>5</td>
<td>30</td>
<td>0.3</td>
</tr>
<tr>
<td>Lithuania</td>
<td>63</td>
<td>21</td>
<td>20</td>
<td>11</td>
<td>13</td>
<td>21</td>
<td>4</td>
<td>30</td>
<td>0.2</td>
</tr>
<tr>
<td>Hungary</td>
<td>77</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td>9</td>
<td>11</td>
<td>4</td>
<td>37</td>
<td>0.4</td>
</tr>
<tr>
<td>Poland</td>
<td>53</td>
<td>10</td>
<td>15</td>
<td>10</td>
<td>22</td>
<td>28</td>
<td>10</td>
<td>39</td>
<td>0.2</td>
</tr>
<tr>
<td>Romania</td>
<td>78</td>
<td>31</td>
<td>16</td>
<td>18</td>
<td>5</td>
<td>13</td>
<td>1</td>
<td>21</td>
<td>0.0</td>
</tr>
<tr>
<td>Slovenia</td>
<td>18</td>
<td>16</td>
<td>25</td>
<td>2</td>
<td>41</td>
<td>38</td>
<td>15</td>
<td>39</td>
<td>0.3</td>
</tr>
<tr>
<td>Slovakia</td>
<td>77</td>
<td>2</td>
<td>12</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>21</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: Author, calculated from the statistical data extracted from www.eurostat.org. European size unit (ESU), is a standard gross margin of EUR 1 200 that is used to express the economic size of an agricultural holding or farm. For each activity or “enterprise” on a farm, the standard gross margin (SGM) is estimated based on the area used for the particular activity (or the number of heads of livestock) and a regional coefficient. The sum of all such margins derived from activities on a particular farm is its economic size, which is then expressed in European size units (by dividing the total SGM in EUR 1 200, thus converting it to ESU).
owned or operated by international firms or funds (see next section). Ukraine was the only country among the three where a fairly large smallholder sector emerged. For example, in 2010 there were 2,984 operators farming at least 2,000 ha; the 85 largest among them operated more than 6 million ha of land; the 30 largest, 4.7 million ha (13.6 percent of total cultivated land).5

In the Russian Federation in 2010, 80 percent of farmland was controlled by large corporations; the 30 largest holdings controlled 6.7 million ha, or 5.5 percent of the total surface under cultivation. Several very large agro-processing and trading enterprises have emerged over the past decade.6 In Kazakhstan’s southern cotton-growing region, smallholder growers took the place of the former large collective and state farms; but in the northern wheat-growing regions, massive agri-business groups were created, the largest of which, the Ivolga Holding, came to control 800,000 ha in Kazakhstan and 700,000 ha in the Russian Federation.7

These large corporate farms came into being in different ways. In Kazakhstan, land was privatized, with the rural population receiving land certificates. But many of them quickly gave up these certificates, sometimes under coercion and at very low prices, allowing the more savvy managers of farm enterprises to build up large land banks with support from urban investors.

In the Russian Federation, the government wished to minimize rural unemployment by protecting the former state and collective farms, stimulating them to create corporate structures and providing them with large loans at soft conditions. These loans, too, were often written off.8 Land shares9 were distributed among the workers, who sold their shares or converted them into shares in corporate farms.10 In the 2000s, large investment groups became active, buying stakes in such corporations and integrating them into large agro-holdings with tens of thousands or even hundreds of thousands of hectares under their control. Agro-holdings consist of a mother enterprise responsible for planning and financial management, and for recruiting the managers of the subsidiary farming enterprises. While family farms were created, these remained of little importance, accounting for only four percent of arable land; household plots accounted for another nine percent.11

In Ukraine, collective farms were divided into small plots and distributed to the collectives’ members, state farm workers and pensioners. Some 6.5 million people received “land shares”. They generally leased their plots to companies, often created by the collective/state farms’ managers, with local or international financial backing that had access to input finance, farm equipment, and processing, transport and storage infrastructure.

1.1.3 Farm structures in poor, agriculture-dependent transition countries

This third group is comprised of relatively small low-income countries. Except for Mongolia, all are members of the FSU where agriculture played and continues to play a major role. In this group, per capita GDP tends to be below USD 6,000, with the exception of Turkmenistan, where natural gas exports boost average income levels. Population size is generally less than 7.5 million people with the exception of Uzbekistan, with a population of 22 million people. A large part of the population of these countries is employed in agriculture. Poverty is widespread, as Table 1

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5 World Bank, 2011.
6 Some of these have become multinational enterprises. For example, the Sodrugestvo Group, established in 1994, is Europe’s largest independent soyabeans crusher, with operations in the Russian Federation, Ukraine and several other countries. To secure its supplies it has become a large operator in Brazil, acquiring Liders Armazens Gerais S.A. in August 2011, the largest Brazilian private company engaged in the storage and transshipment of grains.
7 But Ivolga may well be broken up, as unheeded price exposure in 2008 and 2009 caused it major losses: the company bought fertilizers when the market was at its height in 2008, and then sold its wheat after the price collapse of 2009, leading to its default on a USD 300 million loan (Richard Orange, Ivolga puts world’s biggest farm up for sale, The Telegraph, 13 February 2011).
8 But this assistance was not always enough. The Russian Federation energy firms, for example, became large farm owners in the 1990s because farms were unable to pay their energy bills.
9 Land shares were not necessarily associated with specific plots. The distribution of a farmland over hundreds of land share-holders by the demarcation of individual plots has often been difficult.
10 At times, these sales occurred under pressure from local authorities and others. For example, in the Krasnodar region, authorities imposed a rule that farmers needed to have at least 300 ha before they were permitted to start a farm, forcing individual land owners to either sell or group their land shares (Visser and Spoor, 2011).
11 Osborne and Trueblood, 2002.
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indicates. Every country in this group has at least 26 percent of its population below the poverty line. Another indication is the high percentage of household expenditures on food: almost 80 percent in Tajikistan and Uzbekistan, and 58 percent in Kyrgyzstan.\(^\text{12}\) Rainfall is often scarce. For example, more than 80 percent of arable land in Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan is irrigated, and in Mongolia livestock farming is the predominant form of agriculture.

The countries in this group tend to be cereal importers, with all of the Central Asian countries buying from Kazakhstan.

The approach of the CIS countries to farm sector restructuring varied from country to country. The majority saw large-scale liberalization and a radical restructuring of land ownership, with smallholder subsistence and semi-subsistence family farms becoming the norm. In Armenia in 1991, the land of its 840 state and collective farms was distributed to rural residents; 88 percent of the 282 000 new family farms had a size of less than two ha, and the remaining 12 percent was not much larger, together accounting for only 23 percent of arable land.\(^\text{13}\) Georgia did the same with most of its state land, but kept more than a quarter for lease to larger, market-focused farming companies. With an average of 18 ha, these are still much smaller than the farm companies of Soviet times.\(^\text{14}\) In the Republic of Moldova, a comprehensive agricultural debt restructuring programme also led to a large number of individual farms, although as in other countries, many of the new farm owners leased their land back to their former collective farm managers. In Kyrgyzstan, from 1995 to 2000, 500 state and collective farms (averaging over 2 500 ha) were split into more than 60 000 individual farms.\(^\text{15}\) Mongolia, where 68 percent of livestock was cooperative- and state-owned in 1990, started privatization of its herds in 1992; and by 1999, 96 percent of livestock was owned by herder households. The few remaining state farms as well as agro-processors were also privatized during this period.\(^\text{16}\)

In Tajikistan, the process of land reform was delayed by its civil war, but the end result in the late 1990s was a farm sector in which, at least on paper, new peasant farms controlled most of the land. The remainder was distributed between corporate farms and household plots that already existed in the old Soviet Union, and which continued supplying the major part of marketable surplus. However, at least one third of Tajikistan’s peasant farms in practice are not individually farmed; rather, they are part of collective “partnership” or “dekhan” farms which, in many ways, are the old collective farms cosmetically reorganized.\(^\text{17}\)

Other countries reformed farm structures with a shift from state and collective farms to private family farms,\(^\text{18}\) but retained a strong measure of government control, in particular on the growing and trade of export crops. “The centrally planned mechanism remained nearly unchanged in four major sectors of Turkmenistan agriculture: the so-called strategic crops of grain, cotton, rice and sugar beet. Nearly all the tools of the Soviet economy have survived in these sectors: mandatory output targets, prices fixed by the State, State input supply at privileged (subsidized) prices, and privileged credit.”\(^\text{19}\) The same can be said about Uzbekistan where state control over prices and exports is used to extract significant rents for the government.

1.2 The rise of international farm investment in transition economies

The restructuring of the agricultural sector in transition economies opened enormous opportunities. Kazakhstan, the Russian Federation and Ukraine became the next frontier in terms of their untapped potential for food production. Fertile land that had been allowed to fall fallow and could be returned to productive use, yields on existing farms could be raised through improved management and basic infrastructure such as elevators and internal transport systems was in place. The infrastructure for large-scale exports was weak, however, as these countries were not traditionally exporting to the world,

\[^{12}\] Sedik et al., 2011.
\[^{13}\] Uruytan et al., 2006.
\[^{14}\] Giovarelli and Bledsoe, 2001.
\[^{15}\] Anderson and Swinnen, 2008.
\[^{16}\] Shagdar, 2002. The state farms were reorganized into around 100 private farms of 50 to 60 ha each, mostly growing vegetables.
\[^{17}\] Lerman and Sedik, 2009b.
\[^{18}\] With Turkmenistan forming an exception to the normal pattern of land privatization; instead, land was given in long-term leasehold to individual farmers (Lerman and Sedik, 2009a).
\[^{19}\] Serova and Prikhodo, 2010.
market. In other transition countries, enough leeway was generally left for large-scale farming, but local operators remained hampered by credit constraints and lack of expertise in commercial farming.

These opportunities did not go unnoticed by large international investors. The recent upswing in food prices has only added to the attraction of the sector. Climate change, which will open up large new areas of land in the Russian Federation and Ukraine for grain farming, is also providing a further boost. Many large European agro-industrial firms expanded into Eastern Europe, rapidly taking over much of the sugar sector. Individual farmers from countries like France, Germany, Italy, The Netherlands and the United Kingdom also bought farms in Eastern Europe. Chinese firms started investing in farming in Kazakhstan and Siberia. Also, in the second half of the 2000s, many funds were set up to channel investor appetite for farming in transition countries, and a number of existing investors, including sovereign funds, have added the sector to their asset allocation. After the 2007–2008 global food price hike, Middle Eastern investors have also become active. These funds have been investing primarily in productive agricultural land in Eastern Europe, Kazakhstan, the Russian Federation and Ukraine. The other CIS countries have been ignored to date.

Similar to the practices in the international hotel industry, there are three main investment models. First, one can buy the land and lease it out, benefitting from lease income as well as from an appreciation in land value. To quote from the brochure of a fund that uses this model: “BPT Farmland is offering an opportunity to invest in a unique real estate product: Farmland and related operational buildings in the ‘new’ EU countries (80 percent), as well as in Russia and Ukraine. By using a structure which is separating land ownership from farming operations the risk management and transparency is significantly improved compared to traditional agricultural investments. BPT Farmland combines a potential upside of an agricultural investment with the risk profile and transparency that are known from more traditional real estate investments.”

Second, one can lease the land from a third party and farm it, which implies exposure to both production and price risks. The investors will generally invest heavily in farming equipment and infrastructure. Investors can be individual or in partnership with local agricultural firms. In Ukraine, for example, foreign companies can only lease land as there is a moratorium on land sales. The lease contracts extend only for relatively short terms of from five to 25 years. Contracts are legally weak, since there is little possibility for legal recourse if a local farmer decides to break the lease contract. So, in order to create the large-scale farming operations that are essential for efficient farming, it is necessary to sign lease agreements with many small local owners and maintain good relations with them. In such conditions, a partnership with a local entity can be highly beneficial. Faced with these constraints, many investment funds have preferred to buy into existing local farm management companies.

Third, one can buy the land and farm it. This practice is common for investment funds and farm management companies that are active in countries with a proper land market and clear ownership rights, including many of the transition countries that have since become EU members or are aspiring to do so. In the Russian Federation, it is also possible for foreign funds to buy land.

20 See Gaia Capital Advisors, 2008. Among other examples, the Libyan government had secured 260 000 ha of farmland in Ukraine in a countertrade deal (against oil supplies); Morgan Stanley acquired leases for 40 000 ha of Ukrainian farmland, but its results were disappointing and it sold its land bank again in 2009; Renaissance Capitol, from the Russian Federation, has acquired leases for 300 000 ha which it scaled back to 60 000 to 70 000 ha after the 2008 financial crisis; Black Earth Farming, from Sweden, has acquired 333 000 ha of farmland in the Russian Federation, and Alpco Agro, also from Sweden, has acquired 128 000 ha there; Landkom, from the UK, has acquired leases on 74 000 ha in Ukraine. Typically, each hectare would involve USD 1 000 to USD 2 000 in investments. Another example is Trigo Agri, from Denmark, which has invested in 144 000 ha in Estonia, the Russian Federation and Ukraine. For a broader overview of international investments in agricultural assets in emerging countries see GRAIN, “Seized – the 2008 land grab for food and financial security”; Grain Brefing, October 2008, with an updated October 2009 table in http://www.grain.org/m/?id=266. Visser and Spoor, 2011, analyse the developments in Kazakhstan, the Russian Federation and Ukraine. For details on some of the funds, see Luyt, 2010.

21 Some investments have been discussed, for example in wheat production in Uzbekistan and the Republic of Moldova, and maize production/sheep rearing in Georgia (Visser and Spoor, 2011).

22 http://www.balticpropertytrust.com. In the case of this particular fund, BPT Farmland owns the land, and leases it out on commercial terms to a separate FMC in which it has a 40 percent stake.

23 For example, for a 3 000 ha farm, one may need to sign 1 200 lease agreements. For a discussion on foreign agricultural investment and land leasing issues in Ukraine, see Frishberg, 2010.
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Original funding normally comes from investment funds and high net worth individuals. The investment fund or farm management company (FMC) can be closed to the public at large, or can be listed on an exchange. Some farm management companies, which have grown out of transition country farm ventures, are listed on the Warsaw Stock Exchange. At least one fund, structured as a real estate investment trust, is listed on the Bulgarian Stock Exchange, and another is listed on the Moscow Interbank Currency Exchange (MICEX). Several funds are listed on western exchanges such as NASDAQ/OMX or LSE/AIM. The experience of funds has so far not been as expected. Reportedly, most funds now trade below the original investment value. The main reasons are that the anticipated productivity gains have been largely elusive, and working capital requirements are much higher than anticipated.

1.3 Input finance in a liberalized environment

State-owned companies used to supply heavily subsidized inputs on credit to state and collective farms. This system broke down in the early 1990s. New systems replaced it, but not always successfully. For example, in Tajikistan in 1998 a Presidential Decree established that cotton farmers, a state bank, Agroinvestbank, and private investors called “futurists” were to sign tripartite contracts for working capital finance. The futurists were to supply inputs, and to be paid in a certain amount of cotton. Agroinvestbank was to supply the funds for the purchase of the inputs and secure reimbursement through a monopoly right on farmers’ cotton sales. This system became the primary one for input finance for Tajik cotton farmers; over 80 percent of them procured inputs from the “futurists”. However, the results were dismal. Perhaps because farmers were charged too much for the inputs and paid too little for the cotton, farming became highly unprofitable. But official pressure on farmers to continue growing cotton was such that most felt they had no choice and had to continue supplying the crop, even at a loss. The result, from 2007 to 2008, was a highly indebted farm sector and massive loan defaults.

Nevertheless, in most countries largely effective approaches with respect to input finance were established over the years. One approach, common in Kazakhstan, the Russian Federation and Ukraine, sidesteps the problem of having to deal with a large number of individual producers: large investment groups bought or leased the land of thousands of farmers to create large-scale production units.

A second approach is to re-establish input supply and marketing systems for small growers by strengthening producer associations. International donor agencies often took the lead in such projects. One example is the Tajik Agricultural Finance Framework (TAFF), a USD 35 million loan facility accompanied by a EUR 2.3 million technical assistance programme financed primarily by the EBRD and started in 2007 to replace the “futurist” approach described above. TAFF aimed to allow cotton farmers to borrow from local banks with funds provided by the EBRD rather than rely on loans-in-kind from the “futurists”. In a first phase, banks provide loans to farmers, and the offtakers or ginners guarantee farmers’ obligations. Farmers remain tied to the ginories through offtake contracts. In later phases, farmers are granted greater freedom to choose their buyers while ginories continue to play a role in credit recovery and receive funding from EBRD to provide technical assistance to farmers. This experiment is an interesting one. However, the project did not succeed in dispelling the negative image of agricultural lending shared by all Tajik banks. The project approach remained fairly traditional, with a focus on individual loans and group lending; value chain finance was just a small component. The project’s chance of success would improve, if lessons from international experience on structured cotton value chain finance were incorporated. See Annex 9 for an example.

24 In particular, Ashta-Kyiv, which has its parent company in The Netherlands, and all its productive assets – accounting for some 15 percent of the country’s sugar production – in Ukraine; and the Kernel Group of Companies, Ukraine’s largest vertically integrated agro-industrial firm, with a prominent position in the sunflower oil market. 
25 Advance Terrafund REIT, the largest owner of agricultural land in Bulgaria after the Bulgarian State. It leases out its land to farm companies. IFC is one of its shareholders.
26 The Razgulyay Group, active in wheat, maize, rice, sugar and poultry.
27 Luyt, 2010.
29 See EBRD, 2010.
A third approach ensures that input and other working capital finance are incorporated into value chain structures, such as contract farming operations or, somewhat more loosely, financing/offtake contracts with processors. In the countries where this approach has been used — and examples can be found in most countries — the actual degree of structuring and risk management tended to remain limited, and there was a strong reliance on the relationship between the offtaker (e.g. the food processor) and individual farmers. For example, oilseeds and grains processors in several countries directly paid for fertilizers and other inputs used by farmers. In some cases, they paid with funding from banks. Dairy companies pre-financed feed supply and provided loans for milking equipment.

The following accounts are a few examples of how financing/offtake contracts have been used in transition countries. In Ukraine, a US farm equipment manufacturer teamed up with local distributors to sell combines and tractors. To ensure payment, the equipment dealer was given the rights to a certain pre-stipulated area, and the rights to harvest, transport, store and sell the grain. Slovakia’s largest sugar processor guaranteed payments for farm input purchases, and also provided payment guarantees for other loans to farmers. In Kazakhstan, a food processor, Foodmaster, has provided pedigree cows to its best suppliers to be reimbursed through deliveries of milk. Also in Kazakhstan, after the land reform in the first half of the 1990s, many independent small-scale cotton farms were created. In order to obtain pre-harvest finance, including in the form of seeds, fertilizers, fuels and water for irrigation, these farmers entered into contracts with cotton ginneries, to sell their product at a price linked to world cotton prices. Cotton ginneries in Kyrgyzstan entered into similar agreements with local growers.

In a final approach, many of the countries that joined the EU created successful market-oriented farms. Local banks, which were acquired by European banks in many cases, developed the skills (or believed they did, for experience shows they were sometimes wrong), to finance these farms on a corporate basis for both pre- and post-harvest needs.

Two forms of input financing structures have been used in other parts of the world, but not yet in transition countries even though a priori they would seem of interest. First, there is secured distribution. This structure can be used for imported inputs, to bring cheap international credit lines as close as possible to the buyer of the inputs, reducing the financing burden and the overall input costs. The international financier, which could be a bank or a supplier, outsources his risks to a credit support agency, which retains control over the commodities until they are paid for. In transition countries with a good legal and regulatory environment and readily enforceable contracts, secured distribution is easy to implement, particularly if one can benefit from EBRD’s counter-guarantee on a local bank guarantee on this type of finance under the EBRD’s Global Trade Facilitation Programme. A sound secured distribution scheme may still be possible if these guarantees do not exist, but implementation will then be more complex and more expensive, requiring shorter transaction cycles.

Another input financing structure that has not yet been used is a full credit wrap on the value chain. From input provision to sale of the final products,

30 See for case studies Swinnen (ed.), 2007
31 See for case studies Swinnen (ed.), 2007
33 Anderson and Swinnen, 2008. Apart from farmers selling to cotton ginneries, one also finds in Kazakhstan many cases of farmers toll-processing their seed cotton with ginneries, and then selling the product (bales of raw cotton and cottonseed) to textile companies or traders. Under this arrangement, ginneries receive a processing fee. Farmers’ security interest is protected through trust receipts (a form of VWHR); the ginneries contribute to a guarantee fund from which farmers can be indemnified in case a ginnery does not release the processed raw cotton back to them.
34 The Programme provides different ways to give such guarantee on a range of trade finance instruments. For example, for an export transaction from Tajikistan to France, the exporter may request the importer to make an advance payment. In order to manage counterpart risk, the importer wishes that this advance payment is covered by a standby letter of credit (L/C). The exporter can ask his local bank to open a standby L/C. But a L/C from a Tajik bank may not be acceptable for the importer: he may require this L/C to be confirmed (guaranteed) by his local bank, or a reputable international bank. It is not certain that a French bank can be found that is willing to confirm the Tajik bank’s L/C; banks tend to have tight country credit limits. This is an example of where the EBRD can come in. If the Tajik bank has been approved as a partner by EBRD, it can ask EBRD to open a standby L/C for an agreed percentage (up to 100 per cent) of the advance payment in the favour of the French bank. With this additional guarantee, the French bank may be willing to accept the Tajik bank’s L/C, and confirm it. The importer now is protected by his local bank. The importer can call on the L/C if the exporter fails to deliver, and can, therefore, safely make the advance payment, which is routed through his bank and the Tajik bank to the exporter. For an overview of the programme see http://www.ebrd.com/pages/workingwithus/trade.shtml.
the transaction is “wrapped” by a credit support agency which could be a collateral management agency, or a FMC. This financing structure has been used to revive Côte d’Ivoire’s cotton sector after its civil war (view Annex 9). It could be equally helpful to revive agricultural sectors in transition economies where traditional input and marketing arrangements were disrupted by the collapse of the planned economy or civil strife. It is particularly useful in situations where one has to retain and support a large smallholder agricultural sector, and to build new supply chains linking smallholders to new markets, whether urban or international.

One further approach that could be considered is to structure input supply as the provision of a service rather than of a product. The farmer outsources the application of fertilizers, pesticides, herbicides, etc. to a third party. A baseline is established for the production outcome that would likely result if the farmer were to continue his usual cultivation practices, and any surplus is divided between the farmer and the “production quality assurance” company. The latter probably has to use weather insurance to cover against the risk of production shortfalls related to weather events.

Except for the last approach, several of the structures described above are widespread, but they have not by any means become pervasive. There is still much scope for regional and sector growth, and for incorporation of pre-harvest financing techniques that can build on the existing experiences. This option is further discussed in chapter 4.
Chapter 2: Reducing the vulnerability of food producers to weather and market risk

2.1 Risks in the agricultural sector in transition countries

Farmers, processors and traders in transition countries are exposed to the same kinds of risks that are prevalent in agriculture everywhere, in particular weather risks, price risks (both for inputs and crops), political risks and risks related to poor support infrastructure. When farmers are exposed to such risks, they may still choose likely gains over insurance, and hence reduced risk. This could be the case because insurance products may be expensive or do not cover specific losses. However, if a risk event occurs in absence of insurance, not only current but also expected incomes will be put at risk.

Weather risk is of major importance for farmers as well as those who depend on their output; hence, not only farmers but also processors and logistics companies may find it useful to manage this risk. It should be noted though that the Russian Federation and Ukraine are better off than other countries as climate change will move farmable zones northward. While more of their territory will become suitable to crop farming, their production will likely become more volatile because of more frequent heat waves.

Other than crop insurance, instruments to manage this weather risk are rarely available. The situation with respect to price risk is not much better. Except for transition countries that have entered the European Commission (EC) and can benefit from the minimum price support provided under the Common Agricultural Policy (CAP) y, there are no effective programmes to shield farmers from price risks either on the input or the output side. Furthermore, if world prices rise, governments may decide to stop exports in order to keep consumer prices low.

Poor support systems add to both risks and volatility. For example, in Ukraine grain prices are overly seasonal, dropping after harvest and rising toward the end of the marketing season. The large difference between post-harvest price and the price a few months later is the result of information asymmetries, a lack of financial risk mitigation instruments and the high cost of farm financing coupled with limited on-farm storage capacities.

Illustrations of weather risk, its impact on production, and price risks are given in Figures 1 and 2. Variability of production is, of course, large in countries with marginal wheat production like Georgia and Mongolia, but even countries with high production, like Lithuania and Romania, show very high production variability. Production for other major crops is similarly volatile (see Annex 1), as are farmgate prices (see Annex 2).

It should be noted that there are two major aspects to volatility: first, its ex-post effect on earnings; and second, its ex-ante effect on decision-making. In an environment of volatile, unpredictable and, in the absence of local commodity exchanges, largely unmanageable prices, a risk-averse producer would want to reduce his exposure through strategies such as crop diversification and reduction of input usage. Otherwise, as the world’s largest farm company, Kazakhstan’s Ivolga group, has discovered, a combination of high input prices at the time of cultivation and low crop prices at harvest can lead a company into bankruptcy (see footnote 7).

35  See http://www.casact.org/education/oncourses/erm-lecture10-UGG-early.pdf for an example of how a Canadian cooperative, United Grain Growers, used weather derivatives to manage its exposure to “throughput” risk, i.e. the risk that because of lower production, its logistics infrastructure would remain underutilized.

Figure 1:
Variability of wheat production around the five-year average, 2005–2009
(lowest and highest years as percentage of average)

Source: Calculated using the FAO Statistics Database. See Annex 1 for data.

Figure 2
Farmgate wheat prices in Azerbaijan, Belarus, Kazakhstan, the Russian Federation and Ukraine 2000–2009, USD/tonne

Source: Calculated using the FAO Statistics Database. See Annex 2 for data.

As for the relative importance of the various risks, Figures 3 and 4 show responses to risk surveys by large farmers who have farms covering an area of 1 000 to 10 000 ha each, in the Russian Federation and Ukraine.
Out of the various risks, weather risk was considered the most important. Farmers mentioned a range of weather risks: drought was the most frequently mentioned, followed by frost, winter kill and hail. The average losses from drought were estimated at 52 percent (the Russian Federation) and 41 percent (Ukraine), and the average losses from frost were estimated at 41 percent (the Russian Federation) and 43 percent (Ukraine).37

The surveys also measured the risk management response of these large farmers. It should be noted that respondents were generally well-qualified and experienced – 65 percent (the Russian Federation) and 76 percent (Ukraine) had university degrees.38

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37 Swiss Re, 2010a and 2010b.
38 Swiss Re, 2010a and 2010b.
### Table 3
Risk management response of large farmers (acreage of 1 000 to 10 000 ha) in the Russian Federation and Ukraine (percentage of total respondents)

<table>
<thead>
<tr>
<th>Weather risk management</th>
<th>Input cost risk management</th>
<th>Crop price risk management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Russian Federation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• use subsidized crop insurance: 35%</td>
<td>• government ad hoc payments: 22%</td>
<td>• price hedges: 30%</td>
</tr>
<tr>
<td>• rely on government payouts in the case of catastrophic droughts: 28%</td>
<td>• fuel price hedges: 21%</td>
<td>• state-set prices: 24%</td>
</tr>
<tr>
<td><strong>Ukraine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• use subsidized crop insurance: 40–50% for the various weather risks</td>
<td>• input cost hedges: 38 % (around 12% hedges diesel price risk, which is the major input cost risk)</td>
<td>• price hedges: 44%</td>
</tr>
<tr>
<td>• non-subsidized crop insurance: 20%</td>
<td>• rely on government help: 20%:</td>
<td>• rely on ad hoc government payments: 27%</td>
</tr>
<tr>
<td>• rely on government payouts in the case of catastrophic droughts: 23%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Based on Swiss Re, 2010a and 2010b.

### 2.2 Dealing with weather risk through index insurance

Traditional multi-peril crop insurance programmes provide coverage for farm-specific weather risks. Despite their broad risk coverage, these programmes have a number of weaknesses, including moral hazard and adverse selection, as well as high transaction costs that make them costly to operate. As a result, crop insurance is mainly used in Organisation for Economic Co-operation and Development (OECD) countries and is often heavily subsidized. The Russian Federation, Ukraine and Kazakhstan have followed this model and introduced large-scale subsidies for crop insurance.

Index-based weather insurance instruments provide an alternative solution at lower operating cost avoiding many of the transaction costs and moral hazard risks inherent in multi-peril crop insurance. 39

Such insurance makes a payout to an insured party, e.g. farmers, when an index reaches a certain level. Measured indices might include rainfall during certain days, maximum daytime or night time temperature or more exotic data such as vegetation indices generated through satellite imagery. The insured event may even be based on an index that is only indirectly linked to the weather, like a livestock mortality index (see Annex 11 for a discussion of Mongolia’s mortality index insurance). In all of these cases, the payout to a farmer is not based on the specific loss that the farmer may have suffered. With such insurance, the farmer has some level of protection against a weather event that occurs in his region. This system may be far from perfect as it may have rained where the weather station is located and not on the farmer’s fields,40 but it is cheap to administer and payments can be made very soon after the weather event.

Weather risk management instruments include futures, options and a range of over-the-counter products. They can provide coverage for a range of weather-related risks: rainfall, temperature, wind strength, cold days and number of hours of sunlight, etc. Exchange-traded products are still scarce. However, on the over-the-counter market, derivatives providing such coverage are, in effect, available in developed market economies and even in a number of developing countries such as India. In all of these cases, an index is created (e.g. number of millimeters of rainfall in location X; average temperature during Y period) and people can take a position in this index. They can enter into contracts that give a certain payout based on the development of the index, in such a way that the economic effect of a negative weather event is compensated by the payout of the contracts. Payouts follow the development of the index. For example, if a farmer sells rainfall

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40 This “basis risk” is much less in the case of insurance against catastrophic events such as droughts whose effects tend to be uniform across a large area than for more frequent events, e.g. rainfall that is ten percent less than normal. This reality is among the reasons for Skees, 2008, to advocate “not to create weather index insurance for events that occur more frequently than 1 in 6 or 1 in 7 years.”
futures, and rainfall falls below the index, he will receive X amount for each millimeter that rainfall has been lower than expected. Presumably, he will be compensated for all or part of the production loss that he suffered as a result of the rainfall deficit.41

Weather index insurance does not need to reach individual households directly. Figure 5 illustrates different mechanisms to reach the final beneficiaries.

Agricultural banks, for instance:
- can act as agents for insurance companies, selling weather insurance through its offices and field agents;
- can bundle weather risk management with input loan packages. For example, the part of the input price that is ultimately paid by farmers is a function of the weather index; the bank claims back any missing money from an insurance company;
- can insist that borrowers take out weather insurance with the eventual claims payable to the bank; or
- can insure their agricultural loan portfolio against weather-related default risk.42

Input providers can, as agents for insurance companies, sell weather insurance through the same channels they use to sell inputs. They may even subsidize the premium, as one company does in Kenya. They can bundle it with their product, so that if the crop fails because of insufficient rainfall, the farmer gets a free new input package. NGOs and governments can “re-insure” against the risk of having to face extra expenditures in the case of catastrophic weather events by buying weather insurance (or weather derivatives). There is not one optimal solution for all situations.

Weather risk management can also be relevant for other parties in the agricultural value chain, such as owners of transport or storage infrastructure whose returns depend on the volume of throughput that passes through their facilities. In countries like Australia or Canada, coverage has been written for such firms.

For weather risk index insurance to become functional, the following conditions need to be fulfilled:43
- the provision of an affordable and reliable mechanism to distribute weather index insurance over intended beneficiaries, and to affect eventual pay-outs. There are many possibilities, as illustrated in Figure 5.

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41 On the other hand, if rainfall is above the index, he pays equivalent sums for every millimetre of excess.
42 BASIX, a micro-finance NGO in India, has done this. See Scott, 2005, and Annex 12.
Innovative agricultural finance and risk management

example, insurance can be sold through the traditional insurance agent channels. It can be bought as a package by an input supply company, and bundled with the sale of input packages, as has been done in India and Malawi. It can be bundled with agricultural finance, permitting a bank to waive loans in case of adverse weather events, as has been done by a microfinance bank in India. It can be sold through mobile phones, with the premium payment as well as eventual payouts going through the mobile phone accounts, as has been done in Kenya. Reliability is important in that insurance agents have to register all insurance sales, and they should be prevented from pocketing individual insurance payments;

- the presence of a sufficiently dense network of professionally managed weather stations. Satellite images can also be used, but for evaluating past weather events one would still need weather station data. These weather stations need to perform reliably and provide trustworthy data;
- the provision of at least two or three decades of weather data. These data must be properly archived and available to insurers at a reasonable cost;
- the availability of sufficiently detailed production data over a similar time span;
- a clear link between a weather index and loss events. The weather event has to cause a similar pattern of losses over a relatively broad geographic area. If losses in a region are mostly due to local microclimates and isolated and random events, index insurance will not work;
- the technical expertise to relate production to specific weather events, and on this basis, design appropriate products and price them. This process can be costly and once a good product is designed, it can be easily and cheaply replicated by third parties. One can therefore argue that the development of insurance products is a public good and should be supported by governments and donor agencies;
- a legal and regulatory framework that permits the offer of index insurance products. Insurance is a highly regulated activity in all countries. To prevent legal problems, index products, even when they are bundled into other products or services (e.g. inputs, loans), need to be authorized by the insurance regulator; and the regulator needs to accept that banks or input providers can act as insurance agents. Furthermore, in the absence of proper national laws and regulations, risk transfer to the international market may be difficult if not impossible. The insurance regulator must ensure that the insurers have sufficient capital reserves to meet potential claims (with access to reinsurance for extreme losses). They have to ensure that insurers pay out on legitimate claims. They also have to ensure that courts do not intervene in payouts, forcing insurers to make pay-outs for no legitimate reason;
- the capacity to design a product and a delivery mechanism that meets “willingness to pay” criteria, based on how much farmers or other beneficiaries are able and willing to pay for specific insurance coverage. In weather insurance as in price insurance, premium rates in the five to 10 percent range have generally been found to be acceptable. However, experience in emerging markets shows that there is much reticence to paying premiums up front. The acceptance of index insurance is much better if it is bundled through some other service, such as input or credit supply, and if premiums are effectively pre-financed. Furthermore, buyers need to fully understand what they are paying for. They have to accept that they may suffer a loss in their physical production due to a purely local event, but not receive any payout because the index was not affected. This acceptance requires considerable awareness-raising efforts; and
- the ability to place the risk with parties that can bear it. It has to be possible to lay off risks to the international reinsurance markets. The government has to be willing to cover parts of the risk. Negative weather events range from frequent but not very serious to rare and catastrophic. Frequent-but-not-serious events should be covered by farmers themselves; insurance coverage would be too expensive. The occasional events with serious impact are the ones on which index insurance should focus. Rare, catastrophic events are very difficult to cover in the market. If an index insurer is to remain solvent, he will limit the maximum payout under his policy. Although there are bond structures (so-
called “catastrophe bonds”) that can serve the purpose, one would generally require a government backup for such catastrophic risks. But the point at which the government comes in to aid its citizens has to be carefully calibrated. One needs to avoid situations in which the expectation of aid reduces the demand for weather insurance.44

Since the early 1990s, international insurance companies have provided weather risk index insurance to international agricultural firms active in Eastern Europe, and some structured financings in countries such as Romania have effectively incorporated production insurances. In some of the larger transition countries, local banks have been developing production risk insurance instruments using captive insurance companies. For example, in Ukraine, banks are increasingly structuring producer finance around future harvests. These banks require their clients to show proper insurance policies written by a pre-approved insurer. Most of the time, banks set up their own insurance companies. The government is supporting this stipulation by making crop insurance compulsory, and providing subsidies to the sector.45

2.2.1 Weather index insurance in Ukraine – a failed experiment46

As discussed above, Ukrainian farmers are highly exposed to weather risk. In the absence of other collateral, banks in the country often lend against the security of expected future harvests, 47 and, thus, are similarly exposed to both weather and price risk. For this reason, banks either over-collateralize (i.e. their loan is small compared to the expected future revenue48), or they insist on borrowers taking additional insurance against yield losses.

The insurance market in Ukraine is poorly developed, and banks often set up their own insurance companies. Insurance tends to be of the traditional type, against specific perils causing damage to specific farms. The procedure tended to be accompanied by the usual problems: in case of a claim it required farm-level inspection of the actual yield, and proof that the decline in yield was due to the insured peril. In 2001, experiments with yield index insurance were started (i.e. farmers received a payout when yields in their area fell below a certain level), but the experience was not wholly satisfactory. Indemnities were paid on the basis of regional yield records which at times proved unreliable,49 and complicated procedures meant that payments were usually delayed by up to six months.

In 2003, the IFC and the World Bank’s commodity risk management group started work on developing a weather index insurance contract in Ukraine. The process proved to be difficult. Among other things, weather data were only available in hard copy, not electronically, and were extremely expensive – up to USD 6 500 for 30 years of weather data per station. This value is five to 10 times the normal cost of equivalent data, in electronic format, in western Europe. There were also not enough weather stations given the size of the country; the distance between stations is over 100 km. However, the potential seemed large given that weather index insurance in Ukraine, once established, would be much less dependent on international reinsurance than is the case in other countries. Whereas in most cases the impact of major climate events on agriculture is homogenous across the country, the correlation of crop yields between eastern Ukraine and the southern region near Odessa is

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44 In practice, it can be difficult to decide when the government needs to start providing compensation. What are catastrophic risks as compared to risks to which farmers have voluntarily and unnecessarily exposed themselves? For example, government guarantees should not encourage farmers to start production in areas where rainfall is insufficient for sustainable agriculture.

45 World Bank, 2005.


47 This lending is done by incorporating a pledge on the future harvest in the loan agreement. The pledge agreement describes the type of grain that is pledged, the location of farm and its size. It has to be notarized.

48 “Banks typically require 200 to 300 percent collateral, depending on the farm’s credit history and the risk level. Future crop usually serves as collateral, but collateral can also be offered in the form of livestock, farm machinery or the personal property of the farm director.” Ukraine: agricultural overview; http://wdc.org.ua/en/node/29. This situation was evident in the early 2000s, when such crop pledges were, reportedly, fairly common. In the late part of the 2000s, they seem to have become rarer.

nearly zero. The regulator had no objection to introducing weather risk insurance for farmers. After intensive consultations with farmers, local officials and scientists, and a detailed analysis of yield and weather data, a product was designed together with one of the larger insurance companies, Credo-Classic. Its winter wheat drought insurance product was ready for marketing by 2005. However, only two farmers signed up. Their experience was so poor that there was no interest in continuing the product.

Many reasons contributed to this failure:

- Subsidized risk-management options should not crowd out market-driven products. With a 50 percent subsidy for the competing products, this condition was clearly not met.
- While other crop insurance contracts benefit from a 50 percent government subsidy, no such subsidy existed for weather index insurance. Whatever the relative merits of index insurance, the subsidy served to make traditional crop insurance more attractive. This fact also discouraged insurance companies’ interest in investing time and effort to understand and market the index instruments.
- Ad hoc disaster assistance to farmers in 2003 and 2004 by the Government of Ukraine lowered incentives for farmers to pay for commercial insurance premiums.
- The insurance regulator only allowed use of index insurance by farmers: input suppliers, processors and banks were not permitted to buy the product.
- There was no capacity in the insurance companies to calculate proper premium levels, so premium rates were directed by reinsurance rates, or rates charged by competitors. This trend discouraged innovation.
- There was not enough time for marketing, and the partner insurance company, Credo-Classic, did not have an established client network among farmers in the target region; nor did their regional staff have experience in agricultural insurance.
- Insurance is generally an unknown concept to most Ukrainian farmers.
- During the period of coverage, Credo-Classic decided to extend it by two weeks. This decision moved two weeks of heavy rainfall into the index, with the result that no rain shortfall was measured and, thus, no payout initiated. Had the company stayed with the originally agreed period, there would have been a payout as the initial critical period, indeed, saw insufficient rainfall. Farmers naturally felt short-changed and not inclined to recommend the programme to their peers.

All in all, the conditions for the successful launch of weather index insurance were not fulfilled in Ukraine in 2005:

- To gather widespread acceptance, products should catalyse access to credit and other financial services, technology or new markets, and they should help generate significant additional income. There was no such catalytic effect in Ukraine, nor were any products or services designed to bring about such an effect.
- Products must be affordable and cover the most relevant risks with minimal basis risk. They did not, as the rules of the game were changed once the farmers started winning.
- There must be opportunities to finance the premium through contractual arrangements with input suppliers or bank finance. No such arrangements were put in place.
- There should be an effective legal and regulatory system to enforce contracts and supervise insurance. With the absence of these systems, the insurance company was permitted to change ongoing contracts.
- There have to be sufficient weather stations to provide unbiased weather data. Only a small part of Ukraine’s farmers live within a 20 km radius of weather stations, which is often considered the maximum possible if basis risk is to be kept within acceptable limits.
- There have to be credible, cost-effective and commercially viable national insurers, and intermediaries that market and package insurance with relevant inputs, technology, agronomic and weather information, and/or financial services. The latter were not available and, in effect, legislation did not permit the “packaging” of weather insurance with other products or services.

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50 Hess, 2009b.
51 Hazell et al., 2010.
52 The conditions described in this section are largely taken from Hazell et al., 2010.
• The product should cover the “right” risks: infrequent, but high-impact events. It is not clear whether this kind of risk coverage was in place.
• There should be availability of cost-effective products, for which the benefits of transferring risk exceed costs for the client. This situation was clearly not the case.

Despite these experiences, it appears that the experiment attracted the attention of a number of Ukrainian insurance companies, and that thinking about possibilities to use weather insurance for a series of crops is continuing.

2.2.2 A scoping exercise: the potential for index-based agricultural insurance in transition countries

Local insurance companies often do not have the required expertise to design and price insurance against production risks, whether using production data or a proxy such as weather data. Even if they have such expertise, regulations often prevent them from re-insuring risks on the international markets, or providing insurance in hard-currency terms with assignment to a foreign bank. International insurance companies are still kept out of many transition countries or remain limited in the product coverage that they are allowed to offer. To some extent, these gaps can be filled by taking out offshore insurance. A company headquartered in an OECD country can buy weather insurance against risks originating in virtually any country, although the insurance company needs sufficient data to calculate premium rates. But such offshore insurance is limited to very large financing deals – in the tens of millions of dollars – managed by banks or trading companies in OECD countries.

Developing index-based insurance will require a significant effort. A 2008 paper (Odening et al.) explores the possibilities in 20 transition countries, categorizing countries along the axes of demand for index-based insurance, and the existence of the preconditions for the establishment of such insurance. Their results are presented in Figure 6 below.

Figure 6
The scope of index-based insurance (IBI) in transition countries

The report recommends that actions are tailored to the specific situation in the respective categories:

- **Quadrant 1 (low demand, poor preconditions):** Albania, Georgia, Belarus, Serbia, Kosovo, and the former Yugoslav Republic of Macedonia. Albania and Georgia have high rainfall and exhibit low yield variability. Thus, demand for insurance is likely to be low. In Belarus, the policy environment is unfavourable, leaving little room for the private sector. For example, the country has a mandatory insurance programme for winter and summer wheat, triticale and barley, provided by the state insurance company and benefitting from a 95 percent subsidy on insurance premium. In Serbia, Kosovo, and the former Yugoslav Republic of Macedonia, there is relatively little demand for index insurance, given rainfall patterns, and the policy environment is not entirely conducive. In this context, there is little scope for meaningful international support for developing index insurance.

- **Quadrant 2 (low demand, good preconditions):** Bulgaria, Hungary, Romania, Croatia and Turkey. In the first four countries, the finance sector is well developed. However, yield and weather risks are moderate, and farmers also benefit from direct income payments granted under the EU’s common agricultural policy. The situation in Turkey is difficult to interpret: the country is large and agricultural production systems are diverse. Lending to agriculture is low, due partly to a high level of risks. Nevertheless, insurance companies have been hesitant to introduce index-based insurance (IBI). The report’s advice here is to try to obtain more detailed information, identify sub-regions and/or niche products where the application of IBI is reasonable, but not with highest priority.

- **Quadrant 3 (high demand, poor preconditions):** Armenia, Kyrgyzstan, Tajikistan, Azerbaijan and the Ukraine. In all these countries, agriculture is highly exposed to weather – especially rainfall – risk. However, the mountainous character of the first three makes it difficult to design appropriate index insurance products. The part of agriculture that is not in such regions is often irrigated, which reduces exposure to weather risk; this is also a factor in Azerbaijan, where there is a subsidized insurance scheme. The case of Ukraine was discussed above.

- **Quadrant 4 (high demand, good preconditions):** Uzbekistan, Republic of Moldova, Kazakhstan, and the Russian Federation. These countries are all exposed to high weather risk, while they have well-developed financial sectors, including insurance sectors that have the capability to introduce index-based products. Competition from subsidized insurance programmes is a hindrance, however. The report’s advice is to obtain more information by means of pre-feasibility studies or pilot projects and to facilitate the implementation process of IBI.

### 2.3 Dealing with price risk

Farmers and others can deal with price risks by passing them on to others through forward contracts, or they can manage them by using organized futures and option markets.

Through their contractual arrangements for the sale and delivery of crops, farmers can shift certain risks to buyers. This shifting of risk is especially possible if farmers can become part of value chains wherein they receive credits to enable them to grow crops as per buyers’ specifications, and where their sale, albeit not necessarily their sale price, is guaranteed. Forward contract arrangements to this effect have been developed in many transition countries. Among other things, they permit banks to provide loans to small farmers who otherwise would have insufficient collateral, on the back of a tripartite agreement in which a processor/trader commits to buy a farmer’s crop and routes the payment through the financing bank to enable easy loan recovery.

Forward sales contracts are normally linked to the provision of inputs on credit, not only to ensure sufficient production, but also to create a situation where farmers who decide to side-sell their crop (i.e. default on their obligations under the forward contract by selling to a third party) lose future
access to input finance. Such risk mitigation is necessary because forward arrangements of any kind carry significant default risk. When farmers can realize a better price by selling to a third party, they can easily renege on their obligations under the forward contract.

Using futures contracts is a tool for managing price risk. Actual physical trading practices are not necessarily affected. By buying or selling futures on an organized commodity exchange, farmers and others can lock in certain price levels independent of their physical trading operations. Even if farmers do not use futures markets, they benefit indirectly through better price information, more flexible sales/pricing options and more competition in both crop and agri-finance markets. Options are risk management instruments that do not lock in prices but give protection against unfavorable price movements, with the possibility of benefitting from favorable ones. Where farmers have access to risk management markets, they use these instruments to gain greater control over and more flexibility in their marketing and pricing decisions, rather than just to reduce risk.53

Futures contracts do not conflict with forward contracts. In effect, a futures market will support much wider use of forward contracts, as buyers will be able to lay off their price risks much more effectively. Fixed-price forward markets in an environment without futures carry very high default risk; in addition, the transparency and discipline imposed by a futures market will further reduce contractual risks.

Farmers and others do not need to trade on their own account through a broker on a commodity futures and options market. As Figure 7 illustrates, there are many ways for them to access commodity risk management markets.

Even in the United States of America – the country with the longest experience with the agricultural futures market – most farmers do not directly use organized exchanges. If they do, they use options more often than futures. Rather, the prevalent mode of access is through fixed- or minimum-price contracts with elevators and traders. In a competitive market, such buyers will try to strengthen their competitive position by building various forms of price risk management into their offers to farmers. In Canada or the United States of America, for example, farmers can choose from a panel of over a dozen different pricing formulas built into spot and forward contracts.54

Cooperatives often run risk management programmes both for crops and for inputs such as diesel. Members benefit by, for example, having access to diesel at a fixed price. In other cases, as is prevalent in the cotton, palm oil or sugar sectors, processors and other corporates may run contract farming programmes or offer fixed prices to farmers who supply them. They lay off the resulting price risk on an exchange. In some cases, over-the-counter risk management providers such as banks or large trading firms may offer risk management instruments that are tailored to specific conditions. For example, they may use a local reference price rather than the global futures exchange price. Alternatively, they may "warehouse" these risks (i.e. carry them on their books until it is convenient to lay them off) or manage them on an exchange.


54 See for example http://www.cargillaghorizons.ca/_documents/grain_contracts/prairies.pdf
There are many other possible forms of distribution, with price risk management (either as a price reference or an insurance-type feature) built into input prices or agricultural loans. And there are some forms that have yet to be used. For example, warehouses could guarantee farmers a minimum offtake price, or options could be packaged and sold in the same way as lottery tickets.

Price risk management requires a number of conditions:

- There should be a relevant liquid reference market. Despite efforts in many countries (discussed in the next chapter), there are no successful, liquid agricultural futures contracts in transition countries. Using the leading global market, the CME, is challenging, not only because the logistics of using an overseas exchange can be cumbersome, but also because local prices in transition countries do not necessarily move in tandem with CME prices.
- In some cases, traders are willing to offer fixed-price contracts, or minimum-price contracts using local prices as reference. However, the default risk on such contracts is high. When prices move adversely, the counterparty may renege, either overtly or by disputing the performance of the buyer or seller. Therefore, when legal enforcement is weak, fixed prices will be acceptable for buyers only if sellers have a very good track record. This reality strongly limits possible applications in transition countries.
- Other conditions remain theoretical as long as there are no relevant futures markets. They include the need for acceptable grades and standards in physical trade; a supportive legal and regulatory framework; a brokerage network with reasonable distribution ability; an understanding by banks of price risk management and their willingness to offer credits at better terms to those managing their price risk; a reasonable electronic payment system; the ability of prospective users to open brokerage accounts; and so on. Price risk management, therefore, requires considerable institution-building (see further discussion in the next chapter). Fortunately, although the challenges remain daunting, exchanges have become cheaper to set up and, thanks to the Internet, networks of users can be built much more easily.
Chapter 3: Building institutions for agri-finance, trade and risk management

This chapter focuses on two institutions that can play a central role in organizing agri-finance, trade and risk management in transition countries; namely, commodity exchanges and WHR systems. It builds on two earlier studies done by the FAO Investment Center.55

3.1 Commodity exchanges in transition countries

Two out of three transition countries have at least one commodity exchange (see Annex 3). The largest number can be found in Turkey with over a hundred exchanges, although fewer than one fifth of them play a role in physical trade. The remainder serve tax registration purposes. The Russian Federation and Ukraine each have a few dozen operational commodity exchanges, and many more registered but inactive exchanges. Despite their rapidly developing commodity sectors, most exchanges in these countries only provide auction platforms and do not provide financing and risk management services.

Most of the other countries of the FSU also have one or a few commodity exchanges, with Azerbaijan and the Baltic States being the only exceptions. Poland has about 20 commodity exchanges, acting mainly as wholesale platforms. Most of the other Eastern European countries, including those that are now part of the EU, have between one and six exchanges. The Eastern European exchanges include a number of energy exchanges, as well as financial exchanges that also offer agricultural contracts. Only a handful of the exchanges in this region have an agricultural focus, acting as auction centers.

The exchanges in transition countries tend to have weak organizational and financial strength and play an insignificant role in their economies. Many exchanges operate at unsustainably low transaction levels and are likely to disappear unless they are completely reorganized and upgraded, which would necessitate substantial financial support from the government or international agencies. Where they do play a role, it is generally with financial sector contracts or, in one case, with gold contracts. Nevertheless, there are positive developments on a number of exchanges.

Agricultural contracts are of little significance for most of the large exchanges in transition countries. Of the exchanges offering agricultural contracts, six56 are well developed in Hungary, Romania, the Russian Federation and Turkey and can be compared with exchanges in Europe, the United States of America, Brazil, China and India. These exchanges have sound technologies including electronic trading and offer a sophisticated range of instruments including agricultural futures contracts. They are reasonably well integrated in the community of international exchanges and have a well-developed organizational structure, which is generally visible on their website. In terms of trading volumes, however, turnover in agricultural contracts tends to be low. Their trading volumes are concentrated in precious metals, as is the case of the Turkish Derivatives Exchange, TurkDex, whose gold and silver contracts make it the largest commodity exchange in transition countries, and in securities and financial derivatives such as stock indexes, currency futures and interest-rate contracts.

There are also a number of "emerging" exchanges for which agricultural contracts are of considerable importance and which have been investing in upgrading their systems and practices by introducing an electronic trading platform, a clearing system and forward contracts. These emerging exchanges consist of around 10 exchanges in seven countries, including Turkey.

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55 Höllinger et al., 2009, and Belozertsev et al., 2011.
56 Burse Romana de Marfuri (Romania), Budapest Stock Exchange (Hungary), Moscow Interbank Currency Exchange, Russian Federation Trading System, St. Petersburg International Mercantile Exchange (all three in Russian Federation – in 2011, the first two decided to merge) and Turkish Derivatives Exchange (Turkey).
Innovative agricultural finance and risk management

and countries of Eastern Europe and the FSU. In terms of trading volumes, it is in this group that the largest agricultural exchanges can be found. The largest is the Izmir Mercantile Exchange, with annual cotton trade valued at over USD 2 billion. Several of these exchanges are profitable and cash rich, and some have been developing innovative approaches. For example, the Belarus exchange offers buyers the possibility to buy goods and commodities free on board (FOB) in ports in other countries on the Baltic and the Black Sea, meaning that the buyer does not take on the risk or cost of transport. The exchange takes on the risk of transport from Belarus to these ports by laying it off through the country’s export-import bank.

In a further eight countries, there are less-evolved commodity exchanges that offer trade in agricultural commodities. Half of these exchanges, all located in the FSU, are barely active. Others are in a transition from an open outcry auction-type platform to a more sophisticated exchange, offering electronic trading services as well as value-added information and quality control services, as is the case for three countries of former Yugoslavia.

In summary, despite the large number of commodity exchanges in transition countries, only half a dozen have reached a good level of development, and these exchanges barely trade agricultural commodities. About 20 other exchanges have some potential to offer agricultural risk management tools and may be supported in these efforts.

There is ample scope for growth, and in countries such as the Russian Federation and Ukraine, which have recently seen renewed attention from the CME, interest in developing agricultural contracts remains strong. The total annual trading volume of all commodity contracts in all transition countries together is estimated at around USD 10 billion, primarily in Turkey where most trading is in gold. This value is less than what is traded in one day on the main exchanges in China or India. In many countries, the underlying physical commodity sectors are large enough to support important volumes at exchanges. For example, the role of countries such as Kazakhstan, the Russian Federation and Ukraine in world grain and oilseed trade has developed to a level that successful Black Sea grain and oilseed futures contracts could attract avid international interest.

3.1.1 Developing wheat futures: the Russian Federation experience

In April 2008, the National Agricultural Mercantile Exchange (NAMEX), a subsidiary of Russian Federation’s leading stock exchange MICEX, made a first attempt at developing wheat futures. NAMEX had a large regional reach, providing remote access points through various regional exchanges. Since 2002, it also had been buying grains on behalf of the Russian Federation Government, for its market intervention programme. NAMEX counts the Russian Grain Union among its shareholders. It was thus well placed to succeed. NAMEX introduced two milling wheat futures contracts: one contract for 65 tonnes with delivery of franco elevators in the South Russian Federation (43 elevators had been accredited), and one contract for 60 tonnes with FOB delivery in Novorossiysk, Russian Federation’s main port on the Black Sea. The contracts had a good start, achieving a total turnover of over 5 million tonnes in 2008, which almost doubled in 2009 to 9.2 million tonnes, representing 149 249 contracts, worth USD 1.4 billion. Two thirds of this value was for the export contract, and the remaining third for the franco elevator contract. However, in 2010 stagnation set in, with a growth in volume of only 12 percent.

57 Belarus Universal Commodity Exchange (Belarus), Eurasia Trading System and Kazakh International Commodity Exchange (Kazakhstan), Izmir Mercantile Exchange and Konya Ticaret Borsası (Turkey), Kiev AgroIndustrial Exchange “Kievagroprombirzha” (Ukraine), Sofia Commodity Exchange (Bulgaria), Uzbek Commodity Exchange (Uzbekistan), Warsaw Commodity Exchange (Poland).

58 Armenia, Kyrgyzstan, Macedonia, Republic of Moldova, Serbia, Slovenia, Tajikistan, Turkmenistan.

59 In May 2011, CME announced the signing of MoUs with the Ukrainian Government and National Bank, and with the Ukrainian Futures Exchange (a hitherto largely non-operational entity) to develop financial and derivatives markets in Ukraine for grains and other products; a Black Sea wheat contract would be launched on CME’s electronic trading platform, Globex. The arrangements for implementing these MoUs are weak, however.

60 Estimate based on the information as provided in the websites of the individual commodity exchanges. Most of the smaller exchanges do not publicly report their volumes.

61 In 2010, the Dalian Commodity Exchange in Dalian, China, traded USD 6.3 trillion worth of commodities, and the Multi Commodity Exchange of India traded USD 1.9 trillion.

62 Such state intervention purchases can be large. For example, from August 2008 until May 2009, total purchases through NAMEX reached 8.6 million tonnes (MICEX The MICEX Group in 2009, Moscow 2010).
While this level is still 10 percent higher than the 2010 volume of the European wheat futures contracts on the London International Financial Futures Exchange, it is negligible compared to volumes in the main international wheat futures contracts in Chicago.

3.1.2 Regional exchange projects

In certain cases, developing a commodity exchange with a regional outlook may be feasible, if political support could be secured. In particular, there are the following possibilities:

- Revive the work done towards the establishment of a regional grain and oilseeds futures exchange for the Black Sea Basin and the countries on the Danube river; in particular, Hungary, the Former Yugoslav Republic of Macedonia, Romania, Serbia and Turkey. Turkey, with its large domestic production and consumption, has the best potential for developing such an exchange, but the window of opportunity for a regional initiative is small. One of the large western exchanges would do well to introduce a Black Sea wheat contract with delivery locations in one or more of the EU member countries in the region.

- Develop a grain and oilseeds futures exchange that serves the export-oriented grain sector through the Black Sea of the Russian Federation and Ukraine. The grain exported from these two countries is very similar in quality and in export destinations, and export prices are well correlated. If the two countries could agree to coordinate their grain policies, a regional organized market would become feasible.

- Develop a regional grain exchange for Kazakhstan, Kyrgyzstan and Turkmenistan, trading a range of contracts including spot, forwards, repos and futures. The latter two countries are already importing much of their grain from Kazakhstan, and their importers would benefit from the opportunity to buy through a Kazakh exchange or to hedge on such an exchange. Given the economic and political conditions in these countries, an exchange of this nature could be built gradually. It could start with EWR-based spot trading, bring in financiers once there is enough trust in the system and, as volumes picked up, futures could be introduced.

- Develop a regional cotton exchange for Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. As Uzbekistan is the world’s second largest cotton producer, this option is probably best based on the regional expansion of Uzbekistan’s main exchange, UZEX, and the development of its contract base. For example, it can include Kyrgyz warehouses among those where its cotton contracts are deliverable. To be successful, such a regional exchange would have to introduce new contracts such as repos and trading modalities like EWRs which are of particular interest to the smaller countries.

- In the political context of the CIS, there have been talks on the potential development of the so-called “CIS Common Market”, which would include agricultural products. Should a system of unified customs rules for the CIS Common Market countries indeed be realized, then the large national commodity exchanges can link electronically and act as a backbone for regional trade and price formation. The CIS Common Market has not made much headway as of 2010 but talks are still continuing. Meanwhile, three of the core countries (Belarus, Kazakhstan and the Russian Federation) have created a Customs Union. As part of the work of this Customs Union, the agriculture ministries of these countries have decided that the Belarus Universal Commodity Exchange (BUCE), MISEX and the Kazakhstan International Commodity Exchange (KICE) will coordinate their efforts to create a new organized marketplace for commodities, the Eurasian Commodity Exchange, to trade agricultural products. A protocol of intent to this effect was signed in February 2010.

- There have also been talks among the Central Asian countries Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkey, Turkmenistan and Uzbekistan, on how to intensify commodity trade in the region for energy items, agricultural commodities and some other raw materials. Again, the political process would have to succeed first, followed by implementation of unified customs rules and regulations. If unified rules are implemented, commodity exchanges, particularly in Kazakhstan, Turkey and Uzbekistan, could play key roles in the regional commodity trade, price formation and risk management practices.
Technically, with the spread of fast internet access and the development of cheaper, better performing electronic trading and payment systems, such regional projects face fewer barriers.

3.1.3 Obstacles and constraints
The absence of large, successful commodity exchanges does not mean that such exchanges could not become relevant for the region. Commodity exchanges can offer a wide range of tools which could help improve agricultural marketing and make agricultural investments, processing and trade safer and more profitable.

The agriculture sectors in transition countries have generally been moving from heavy state domination and control towards more liberalized, market-oriented systems, though some countries are lagging behind. After liberalization, commodity exchanges could step in and perform many of the marketing and risk management functions formerly performed by the state, in support of the newly emerging private sectors. However, developing successful exchanges is a challenging task and many constraints are yet to be properly addressed in most transition countries.

While lack of familiarity with exchange mechanisms and risk management is a challenge that cuts across most of the region, other constraints vary depending on country-specific conditions such as the size of the agricultural economy, the development of the agricultural and financial sectors and commodity policies. If, for example, agricultural production is low and the size of the potential market for an agricultural exchange is small, a national exchange may be financially non-viable. If agriculture is poorly organized, with insufficiently trained farmers, processors and traders, it may be very difficult to acquire enough traction for the exchange project to take off. These projects are further hindered if bankers have little understanding of modern commodity marketing and financing mechanisms, and if there are no organized speculators interested in becoming active on an agricultural exchange. Without speculators an exchange cannot grow. If, on the contrary, agriculture is highly organized, with just a few large, vertically-integrated companies dominating agricultural value chains, then these companies may not be too keen on introducing mechanisms which increase transparency in their markets.

Agricultural and trade policies are important determinants for the scope of commodity exchange development. For example, interventions in agricultural markets such as export bans as well as other interventions to reduce price fluctuations undermine commodity exchange, especially if implemented in an arbitrary manner. Also, as can be inferred from the fact that commodity exchange initiatives that focused on European farming have never done well, whether in France, Germany, the Netherlands or the United Kingdom, the safety net provided by the Common Agricultural Policy (CAP) is in contrast with the idea of farmers fending for themselves in the management of the price risks to which they are exposed. Thus, new agricultural exchanges in EU accession or pre-accession countries may be a difficult proposition, at least in the near future. In the longer term, the further reform of the EU’s CAP might increase the scope for commodity exchanges. Finally, government attitudes towards commodity
exchanges also matter: a government that wants to retain control over a commodity exchange is likely to stifle its growth.

3.2 Warehouse receipt systems

In the late nineteenth and early twentieth centuries, WHR finance played a major role in enabling the development of agriculture in the United States of America. The federal government recognized the importance of this financing tool, and boosted the ability of local banks to lend to the agricultural sector by opening a special discount window for loans by WHR.63 There were similar financing systems, with government support, in Europe. But in the course of the 1920s and 1930s, financial reporting improved with the development of credit bureaus like Dun & Bradstreet and of rating agencies, and with the creation of a better organized accountancy, auditing, tax and legal system. Thus, it became much easier for banks to judge companies on the basis of their balance sheets and track records, and to pursue reluctant creditors.

One could assume that the situation of agriculture in transition countries after the demise of communist rule was similar, and that WHR finance could have played a similar role in reviving the sector. Indeed, such was the thinking of some donor agencies, including the Canadian International Development Agency (CIDA), the Common Fund for Commodities (CFC), EBRD and United States Agency for International Development (USAID). They funded several projects, in countries such as Bulgaria, Poland, Romania, the Russian Federation and Ukraine, primarily focusing on creating an environment conducive to WHR finance. Work was also supported in Turkey.64 These projects included legal and regulatory components, often targeting the introduction of new national legislation. They were involved in awareness-raising for local banks and the development of “carrots” for them in the form of refinancing opportunities (with EBRD), along with various actions meant to make local warehousing companies more secure, such as fidelity funds.

These projects have had some success, but there is still room for improvement. Local banks generally remained unwilling to explore the possibilities of WHR finance, inter alia because of continuing and often justified concerns about the reliability of local warehouse operators. Legal and regulatory reforms often stalled. Warehouse operators were not keen to contribute to fidelity funds. Some projects were oriented at replicating western WHR systems, in particular, those of the United States of America, but were insufficiently adjusted to the specific conditions of emerging market commodity sector. There has also been an overemphasis on the creation of a legal and regulatory framework while much less attention has been paid to supporting concrete operations solutions on the ground. Those include collateral management/credit support which is the vehicle for most WHR finance in emerging economies and value chain finance. EBRD, which has been the major driver of WHR finance programmes in the past with projects in Bulgaria, Czech Republic, Hungary, Kazakhstan, Lithuania, Poland, Romania and Slovakia continues its support in this domain. Since 2008, it has added Bosnia, Serbia, Tajikistan and Ukraine to the countries where it works or will work on WHR finance.

3.2.1 The state of warehouse receipt finance in transition countries65

EBRD’s and other donor agencies’ support of the development of WHR finance has been successful in a number of countries, most notably Bulgaria, Hungary, Kazakhstan, Republic of Moldova, Serbia and Slovakia. In these countries, the initial consensus among key stakeholders was built, the important elements of a WHR system were put into place and many local private sector banks have begun to finance against WHR. Local bank finance reaches more than USD 1 billion a year in Kazakhstan, and several banks have set up their own field warehousing operations, putting their own agents on the grain elevator premises. In Bulgaria, some

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64 WHR finance is relatively well developed in Turkey and is predominantly conducted by banks using their own warehousing subsidiaries. Turkish banks own a large number of warehouses, especially at ports. These warehouses were primarily used for financing operations, in particular, for pre-export storage of cotton and tobacco. Each bank uses its own warehouses. It will be a challenge to convert this system into a more “open” system, where warehouse owners agree to provide storage and WHRs for third-party depositors.
65 For an extensive country-by-country overview, see Belozertsev et al., 2009.
local traders finance their grain trading operations completely on the basis of WHR and off-take contracts, without any fixed assets required as collateral by the banks.

Other countries such as Croatia, Romania, the Russian Federation, Turkey and Ukraine have at least established rudimentary WHR systems. They are developing them further by means of donor support, except for Poland, where much work was done, but progress then halted towards the late 1990s. Some countries actively use WHR finance in certain sectors, e.g. to finance local stocks of grain or exports of hazelnuts and tobacco in Turkey. In other countries initial efforts to create a comprehensive legal framework and to pilot WHR finance have not developed into full-scale implementation, in part because of lack of local stakeholder support. In many cases, core elements of a WHR system such as a proper institutional framework for licensing and inspection of public warehouses, or financial performance guarantees, are still missing. In the Russian Federation, Turkey and Ukraine, though, there is some financing based on field warehouse arrangements, particularly for grain and oilseed exports and various imports. Some of these countries are still trying to move forward. For example, in the Russian Federation improvements in the legal framework are from time to time discussed in the country’s Duma, and the need to expand the scope for WHRs is, at times, mentioned by the country’s leaders.

A considerable number of transition countries do not yet have WHR legislation in place. Nevertheless, the potential to develop WHR systems has been identified by donor agencies in a number of countries, including Tajikistan and Uzbekistan. In a few countries, like Uzbekistan for cotton, international banks already provide WHR finance. Work to expand the use of WHRs by local banks has started in some of these countries. For example, Georgia and Azerbaijan are included in the activities of Ukraine’s Agrarian Markets Development Institute (AMDI) to create a common grain trading platform.

3.2.2 Obstacles and constraints

There are a number of obstacles and constraints to the full-fledged operation of WHR systems in transition countries.

An appropriate legal framework can be a strong support for a functioning WHR system. Without a good legal framework, the WHR system depends on the contractual relationships between the different parties active in the agricultural sector, and on their perceived credit risks. In such conditions, transaction costs are higher and bank credit committees will be more reticent to approve transactions. Electronic systems can help here, as bankers feel comfortable with the access to documentation and information that they provide. The better the legal framework, the wider the range of possible transactions. Bank risk controllers and credit committees, in particular, feel more comfortable when there is strong legislation in place protecting the integrity of the system, establishing clear procedures in case of bankruptcy and default and allowing the perfection of security interests.

Despite the importance of an enabling legal framework, it should not be regarded as a pre-condition since WHR finance is also possible with a poor or virtually non-existent legal environment. In the past, some donor agencies have put undue reliance on getting the government and parliament to promulgate supportive warehouse legislation. This process has proven to be costly and slow and, at times, unsuccessful. Poland is a prime example, which, compared to the global experience with WHR finance, has been somewhat misguided. Although there is no specific WHR finance
legislation, it has worked perfectly well in the Republic of South Africa. For example, most of the country’s grain that is not used for intra-firm trades is managed and traded through the country’s EWR system. On the other hand, there are countries like Brazil where there is a comprehensive legal environment, but the government mismanaged its supervisory powers over the sector to such an extent that, for a long time, WHR finance was not used by the country’s banks.

Ideally, one would want to see a strong system of licensed and supervised public warehouses. In the absence of such a system (as is unfortunately still the case in most transition countries), the financial institution is exposed to the risks related to the warehouse operation, such as improper handling, damage or loss of the collateral or fraud. These operating risks are normally mitigated through a highly selective choice of warehouses and close monitoring by specialist collateral managers.

Things do not always go as planned. In recent years, banks have lost many tens of millions of dollars in agricultural finance deals in which the WHR component was improperly structured, in countries like Hungary, the Russian Federation and Ukraine. To some extent, these losses are due to banks not realizing the difference between inspection, that is, spot checks on whether commodities are still in the warehouse, and collateral control, where a third party is liable for the continued presence of the commodities in the warehouse.

For example, in 2008, there were large losses in WHR finance in Hungary because banks had improperly structured their schemes. Based on what they understood from the system in the United States of America, the government and banks had promoted a system of WHR finance using public warehouses. Political pressure to assist farmers was strong, and the existing infrastructure of the large public warehouses could not cope with this. In order to increase lending, banks started accepting rural warehouses belonging to farmers’ groups as “public warehouses,” simply leasing them and putting a lock to secure the goods inside. They did not understand that this system was, de facto, a field warehousing operation and should have been managed as such by putting collateral managers in charge of supervising the warehouses and laying off risks to these collateral managers. It is only a matter of time until such a system collapses, and it happened in 2008. Behind the locked doors were empty warehouses.

Similarly, the 2010 loss by international banks of reportedly USD 160 million of grain pre-export finance to the RIAS Group (then the Russian Federation’s second largest grain exporter, accounting for 11 to 13 percent of the country’s total) was linked to loose controls over grain warehouses. In 2009, the gross revenue of the RIAS Group was more than USD 700 million, of which about four fifths came from grain exports. As is typical for trading groups, RIAS was highly indebted. In late 2010, it had debt of USD 360 million.

The domestic debt was secured by RIAS’s fixed assets, but for the USD 160 million of international finance, only grains were used as collateral. Western survey companies, in particular, Control Union, provided inspection and survey services on the ground. The August 2010 grain export ban affected RIAS’s ability to serve its debt, and it started defaulting on both domestic and international loans. In December 2010, Control Union was refused access to the

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71 The success of the Republic of South African system rests on four main pillars. First, there is only a small number of large grain trading and processing companies in the Republic of South Africa, which know each other well. Second, the commercial farming community in the Republic of South Africa is small. There are about 10,000 commercial farmers, but their production is high and they are well organized. They are also serviced by well-organized logistics providers, including the silo operators. The two main shareholders of the EWR system company between them own more than 60 percent of the country’s grain storage. Third, the WHR system has benefited considerably from its synergy with the country’s commodity futures exchange. The exchange accepts silo certificates for delivery, and this facility is popular. Around a million tonnes of grains and oilseeds are delivered annually. Fourth, system management is outsourced to PwC, thus ensuring the confidentiality and integrity of the system.

72 In August 2010, the RIAS Group domestic debt was around USD 200 million (three quarters of which was with Sberbank; the remainder, with two other banks), and international debt was about USD 160 million. The Sberbank debt was collateralized by RIAS fixed assets: agricultural land, in-land grain elevators, river and sea port terminals, feedstuff enterprises, bakeries, etc. The international debt was entirely structured as pre-export finance, mostly contributed by BNP Paribas (about USD 80-85 million), UBS (about USD 50-55 million), and two smaller Swiss cantonal banks, with all the funds provided through to the RIAS Swiss subsidiary. The pre-export facility was signed in October 2009, and funds were disbursed from May to July 2010.
elevators in the Krasnodar region where the grain was supposed to be stored, as evidenced by WHRs issued by these elevators. In January 2011, RIAS declared bankruptcy. No grain was found in the elevators. However, it is possible that it was never bought in the first place, and that the receipts were issued fraudulently. It was supposed to have been bought from June to October 2010. The lack of any direct control of the financiers over the elevators – in other words, the reliance on inspection rather than collateral management – is, therefore, a major reason for the size of the default.

The management of WHR finance would be much improved if transition countries were to adopt EWR systems. So far, no country has done so, although at least Ukraine now has an electronic registry. Annex 6 describes the benefits of an EWR system and how it can be used.

### 3.3 Possible new approaches that merit international support

In many transition countries, commodity exchanges and WHR systems have been on the radar of governments, industry groups and international agencies. In countries such as Belarus and Uzbekistan, the government is the main driver of commodity exchange development, albeit in the context of controlling export flows. The Russian Federation state agencies have been actively promoting new exchanges. Agricultural contracts and exchanges have been supported, among others, by the MICEX, in which the Central Bank is the largest shareholder (holding about 36 percent of the shares). It has used its electronic platform to tie together a number of the regional exchanges, which are dealing in spot contracts. Donor agencies have supported exchange development as well as WHR systems in many countries. How can such interest be leveraged to create truly successful exchanges and fully operational WHR systems, and how can government and donor support be made more effective?

There have been successes that merit replication, but the challenges that new projects face are substantial. Using the same approaches that have been tried in the past may not be the most effective. There are possibilities to innovate, and Table 4 gives a number of suggestions.

#### 3.3.1 Rebalance the focus of projects from regulations to deals

Much of the attention of the donor community has been on improving legal and regulatory systems, whether for commodity exchanges or WHR systems. Helping local counterparts to set up structures that can operate within existing limitations has not been high on the agenda. In a number of countries, legal and regulatory conditions have improved, but no new agricultural exchanges have been set up and WHR finance has remained limited. In other countries, efforts to change laws and regulations met bureaucratic inertia and resistance. Moving forward, the focus should shift to working with local counterparts to develop pragmatic approaches to improve price risk management and WHR finance by focusing on specific contracts and specific transaction structures rather than trying to change the overall policy framework first.

Work to improve the conditions under which exchanges or WHR finance will operate should continue. This work includes policy dialogue and awareness raising among key government stakeholders to remove the risk of arbitrary and unpredictable government interventions, and the introduction of proper laws and regulations.

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73 Laws recognizing the validity of electronic signatures, a necessity before EWR are feasible, are already in place in most Eastern Europe and Central Asia (ECA) countries.
enactment of such new laws and regulations. But this work should go on while deals are being created.

For example, in Azerbaijan, rather than doing general work on exchange development, donors could support the development of a regionally-integrated electronic spot exchange, including one for fruits and vegetables. Among other things, such an exchange can more efficiently link the country’s producers with the buyers in the Russian Federation. In Kyrgyzstan, a work programme can be centred around bringing more efficient finance to the cotton sector, for example, through an EWR programme. In the Russian Federation, support can focus on the specifics of wheat futures, while leaving the “external environment” in the hands of the counterpart exchange. Even with partial success, it will become easier to re-engage the government with a view to improving legal and regulatory conditions.

3.3.2 Improve the incentives to innovate in warehouse receipt finance by widening the range of refinancing options

Currently, organizations such as IFC, EBRD, or USAID’s DCA programme either guarantee or refinance part (i.e. up to half) of the WHR finance portfolio of selected banks in transition countries. The banks have to be individually approved. There is much scope for deepening these programmes. In particular, the approach could shift to opening a “discount window” (akin to that of the Bank of England or the United States’ Federal Reserve) for eligible WHR loans and develop a secondary market for tradeable WHR papers.24 “Eligible” could be defined to include not only deals structured by approved banks, but also deals that benefit from certain credit enhancements (e.g. guarantees by reputable domestic or international entities); deals in transition countries where an acceptable international bank underwrites the risk; or deals which are structured using approved warehousing companies or collateral managers. The senior component of a securitized portfolio of WHR transactions could be discounted. Transactions in any transition country should be eligible, within a broad framework of acceptable

Table 4
Suggested new approaches for the development of commodity exchanges and warehouse receipt systems

<table>
<thead>
<tr>
<th>Traditional approach</th>
<th>Suggested approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>First, set up a legal framework for WHR finance, then promote deals.</td>
<td>First, look at potential deals and structure them around legal constraints; then work to improve legal and regulatory framework.</td>
</tr>
<tr>
<td>Refinance WHR finance originated by selected banks.</td>
<td>Promote innovation towards the development of a secondary market of tradeable WHR instruments, using a wide range of refinancing options including the equivalent of discount windows.</td>
</tr>
<tr>
<td>Look at commodity exchanges as stand-alone projects.</td>
<td>Consider instruments beyond agricultural futures and options, which target the needs of physical trade and/or finance such as repo contracts or project bonds. Then, work with potential partners to introduce instruments one by one.</td>
</tr>
<tr>
<td>Commodity exchanges should look like the exchanges in the west.</td>
<td>Make full use of available technology to develop cost-effective approaches, targeting specific needs on a country-by-country basis.</td>
</tr>
<tr>
<td>Electronic registration is of little importance.</td>
<td>Make EWR systems the basis of WHR projects and use this technology to attract new participants to the sector.</td>
</tr>
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</table>

24 According to Section 13A, clause 1 which dates from 1923 of the Federal Reserve Bank, any Federal reserve bank may discount agricultural paper (for periods up to nine months) that has been endorsed by a member bank, with all such paper with maturities in excess of six month having to be secured by warehouse receipts for readily marketable staple agricultural products, or chattel mortgage upon livestock. The discount facility is available only for staples stored for commercial purposes (stocks held for speculative purposes are not eligible); and the goods must be adequately insured, with the member bank as beneficiary. As an alternative to discounting such warehouse receivable-backed paper, banks can also sell it on the secondary market (the main one is the New York open market of acceptances), but this is not possible for all such paper: it is only open to paper backed by domestically stored staples. In 1978 (Federal Reserve Bulletin 486), this access was further restricted: only receipts issued by warehouses, elevators and terminal companies “duly bonded and licensed and regularly inspected by Federal authorities” are accepted, and then only up to an amount that does not exceed the amount of the bond posted by the issuer. As to the Bank of England, warehouse certificates, including on stocks in countries other than the United Kingdom, can be used to create bankers’ acceptances eligible for discounting by eligible banks.
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The companies that can structure and enhance WHR finance transactions to make them eligible for the discount window, such as collateral management companies and commodity funds, can themselves become interesting investment vehicles for international financing institutions.

Furthermore, by putting greater reliance on the structure and less on the originating bank, the current constraints due to individual bank limits can be overcome. For example, a bank in the Kyrgyzstan that has been approved as issuing bank by EBRD or IFC, structures a state-of-the-art cotton pre-export finance for USD 15 million, starting with seed and input supply and anticipating reimbursement through export sales. If this bank does not have USD 15 million or its local currency equivalent, it can try to obtain an international bank credit, against its own guarantee and assignment of the export sales. This attempt will be very difficult as many banks do not accept any credit risk in Kyrgyzstan. The country risk is considered too high by the banks’ credit committees and, even if they do accept risk, the process of opening interbank credit lines is complex and slow. If it qualifies for an EBRD counter-guarantee, EBRD may well respond that the amount is too large given the balance sheet of the Kyrgyz bank. In reality, risk exposure in this deal may well be minimal. All risks can be systematically mitigated. While assigning all the individual risk mitigants (e.g. weather insurance, WHRs, export contracts etc.) to EBRD may be impractical, there should be ways in which risks are partitioned, with, for example, an international collateral manager providing guarantees to EBRD on physical stocks. In other words, the due diligence/risk assessment can partly be shifted from local banks to international providers of risk management, such as credit support agencies or insurance companies. Then, bank limits are no longer a constraint.

3.3.3 Consider alternative approaches to deliver price risk management contracts

Local futures exchanges are not necessarily the best approach. The possible scope for action can best be described by grouping the transition countries into three broad categories: current and aspiring EU members; large economies of the CIS; and small, relatively poor, economies with a large commodity sector.

In transition countries that have already become EU members or are aspiring to become members, donor agencies should consider carefully whether it is worth creating new exchanges or supporting the fledgling exchanges that already exist. The advanced level of development of commodity sector support companies and structures in the region, such as banks, quality control companies, logistics companies, information vendors, industry bodies and commercial arbitration panels make it difficult for a commodity exchange to compete with high existing standards to provide services that really make a difference.

Work related to price risk management in these countries could usefully encompass the following activities:

- Consider the viability of exchanges as physical trading tools. Several western European countries conduct large agricultural auctions that make intensive use of electronic media and have highly advanced logistics systems. These auctions are so attractive as platforms for physical trade that they even entice international users. Their experience could be replicated in new and aspiring EU member states, and exchanges that focus on these activities, like those in the Former Yugoslav Republic of Macedonia or Poland, could be supported.

- With respect to futures exchanges, these marketplaces can no longer hide behind national barriers and must be able to compete with their long-established peers in western Europe. It is probably already too late for them to reach the necessary critical mass to be able to compete on a stand-alone basis. The best they can hope for is to become part of pan-European exchange networks, giving local market participants access to international contracts. Even then, given their current weakness, they would need new funds for their transformation. Donor agencies, in particular, those associated with the EU and its member countries, may find it useful to support the integration of exchanges in EU accession countries into pan-European networks.

- Turkey is in a somewhat exceptional position within the first group of transition countries.
The large size of the Turkish economy, its unique economic fundamentals as a bridge between Europe and Asia and the large number of sophisticated financial sector companies could enable one or two futures exchanges to become large and vibrant enough to survive EU accession. In particular, there is scope for establishing a regional commodity exchange and attracting new users from throughout the region, including the Central Asian countries. While exchanges in Turkey have so far not made a serious move into this direction, should such a move occur, the international community could provide support.

In the second group of countries, large economies like Azerbaijan, the Republic of Belarus, Kazakhstan, the Russian Federation and Ukraine, the commodity exchange initiatives face different challenges. A lingering mistrust of competitive markets by both the private sector and government decision-makers is an important obstacle. Because of this mistrust, a project to promote commodity exchanges has to have a component that will “capture the minds” of private and public sector decision-makers. Support to the development of appropriate laws and regulations as well as regulatory structures, which has been provided on and off in past years in the latter three of these countries, will remain very useful.

However, in these countries the main bottleneck towards the development of viable agricultural futures contracts lies not with the government, but with the private sector. The large private consortia that back the financial exchanges in Kazakhstan, the Russian Federation and Ukraine do not need international financial support, but they could benefit from improved access to international expertise. In Azerbaijan and Belarus, advisory work on agricultural exchange development may also be useful. Perhaps by trying to replicate the approaches of the Chicago exchanges, which operate in an environment where all of the services for efficient commodity trade are readily available, and trade is supported by a sound legal and regulatory framework, efforts in these countries to build viable agricultural futures contract have not been successful. In any country, if an exchange is to be successful, it should focus on providing the best possible value propositions to key market actors. What proposition this will be depends on the constraints to which these market actors are exposed. Thus, agricultural contracts will have the best chance of success if greater focus is put on areas where exchanges can build up comparative advantages, such as trade security (counterparty risk management), quality assurance and commodity finance across the range of commodities.

In the many small, agriculture-dependent countries of the FSU, commodity exchanges were created in the early 1990s to cope with the disruption of traditional trading mechanisms after the collapse of the old command economy. With the exception of Uzbekistan, the exchanges in these countries have not been able to develop. They do, indeed, face many obstacles, and stand-alone exchanges, even in Uzbekistan, will find it difficult to survive using traditional exchange approaches. These countries need markets that provide suitable risk management contracts, but a new approach is necessary to build such markets. This challenge is discussed in the next section.

3.3.4 Fully leverage technology to create exchanges that fit in the economies of transition countries

Exchange technology as well as the technology surrounding the exchange (brokerage systems, information systems, payment systems) have improved considerably over the past decade. Thanks to advanced technology, countries can make use of the benefits of an exchange, even if it is outside their territory.

This access provides new opportunities for small, poor transition countries. Conditions in these countries make a case for small, low-cost, focused, highly efficient micro-exchanges that use an electronic trading platform (which can be in another country) to trade a broad range of products. The trading platform for such exchanges could be provided on a Business Process...
Outsourcing mode by a regional venture.\textsuperscript{75}

The old auction exchanges, where they have survived, may not be the best anchors for such new ventures. External support for awareness-raising, advice and training could be a catalyst, and venture capital-like funding for exchange initiatives and related market institution-building projects could be the most effective way to empower new private sector initiatives.

In the larger countries where there is scope for a strong agricultural exchange, there is also room for making better use of technology. For example, it is possible to provide brokerage technology (back office, middle office and front office) through a cloud computing approach, which means that prospective brokers do not need to invest in expensive hardware and software, but can, instead, start their brokerage business on a pay-as-you-go basis. Improved risk management systems can protect both the exchange and its brokers against defaults, making it possible to attract a broader range of clients. The Internet makes it easy to build a countrywide network, which can be readily used to trade and to make margin payments, thanks to the development of new safety features.

3.3.5 Boost the use of EWR systems, and use these as platforms to bring in the financial community

So far, remarkably little use has been made of modern technologies to enhance WHR and commodity exchange programmes. The absence of EWR systems in transition countries is particularly surprising. Such systems are not expensive and are likely to earn back their costs rapidly, even in small countries. They save on the costs of printing and safeguarding physical receipts, reduce the risks of frauds and make information about warehousing operations readily available to financiers, giving great comfort to bank credit committees and depositors. They are safely accessible through the Internet, meet banks’ security standards and provide easy interfaces with other systems, such as the back office and front office systems of traders or banks, or price information systems. Annex 6 provides a description.

More importantly, they can be considered as a “proto-exchange,” offering market participants the chance to trade WHRs not just as instruments for physical trading, but also as vehicles for commodity finance. This service attracts both banks and investors to the market, and reduces the financing costs of commodity depositors. It turns WHRs into capital market instruments. An EWR system can and should be used for a broad range of products, not just agricultural commodities, but also metals, petroleum products and petrochemicals, manufactured products and even carbon credits and related environmental instruments.

As the experience of the Republic of South Africa shows, an EWR system does not require a complete legal and regulatory framework for WHR finance. Transition countries should seriously consider the introduction of such systems.

\textsuperscript{75} In order to provide a high quality of services, it is necessary to invest in a fairly sophisticated trading environment, including hardware, software (not just the actual exchange trading engine, but also various supporting softwares, including for brokers), communication systems and the like. And then, in order to operate well, the exchange needs a fairly sizeable and well-trained staff. The resulting high start-up costs and fixed operating costs make it difficult for an exchange in a small economy to break even or even, to offer trading fees that are low enough to generate high trading volumes. The transaction fees on a typical modern commodity exchange are in the range of USD 10 to USD 50 per USD 1 million traded value, for instance. Fortunately, with improved communication systems, it is possible to use a different configuration. Rather than having all the technical facilities of an exchange in each country, it is possible to have a central “exchange service” which acts as a Business Process Outsourcing center for several countries. Each can have its own exchange, which, however, uses the common service infrastructure. Each national exchange can have its national “look”, and access and use can be readily controlled by local authorities. But when the conditions for regional trade exist, it is easy to open up national platforms to regional and international participation.
Chapter 4: Boosting finance for food production, processing and trade

This chapter focuses on innovative approaches to enhancing financing for agricultural production, processing and trade. The first section briefly addresses some of the current programmes to provide facilities to local banks, including microfinance banks. The next two sections take a closer look at the wide range of financing structures currently used in the region, divided into pre-harvest and post-harvest finance, and how these can be boosted using innovative approaches. After discussing how banks in transition economies have structured agricultural finance in the face of the risks prevalent in the sector, lessons from their experiences as well as from other regions will be discussed. The chapter closes with a discussion of the links between a commodity exchange and agricultural finance.

4.1 Providing capacity-enhancing facilities to local banks

EBRD, IFC and other development agencies have, in different ways, been supporting the financial capacity of local banks and non-bank financing institutions to lend to entities in the agricultural sector, both for short-term and longer-term purposes. In many countries, there are a multitude of programmes, although their overall scope may be narrow. Annex 14 describes the case of Armenia as an illustration. Support is for general purposes or for specific ones, such as leasing or WHR finance. Lending, refinancing or guarantee programmes are generally accompanied by capacity-building activities. Capacity building can be focused on existing institutions like banks, or on newly promoted institutions such as microfinance institutions (MFI) or credit unions. These programmes are doubtlessly useful. They build on and strengthen the capability of local banks to finance smaller projects, probably with a catalytic impact on the target sectors. But there is room for broadening their scope and enhancing their impact.

First, capacity building can be streamlined. To simplify, there are two main ways to make lending to the agricultural sector safer: improve credit scoring methodologies for individual candidate borrowers, and develop blueprints for secured and structured financing schemes. In the first case, the bank relies on the borrower, but enhances its ability to judge whether the borrower will be able and willing to meet his loan obligations. In the second case, the bank shifts its risks from the borrower to other parties by a careful structuring of the lending transaction.

Credit scoring methodologies can be codified and incorporated into bank procedures, and staff can be trained in properly applying them. This expertise should be a standard part of the technical assistance that EBRD and IFC give to their partner commercial banks. In many transition countries, banks have little or no expertise in agricultural lending and are wary of the sector. While helping banks to implement the basics of credit risk assessment and loan management in agriculture is a definite improvement, in many of the partnerships...

76 Szabo, 2005, describes guarantee schemes in a number of Eastern European countries.

77 Donor agencies have funded micro-finance and credit union programs in many transition countries, mostly with a focus on small loans, in the USD 50 to USD 100 range, which does not really meet the investment or working capital needs of farmers. Also, the organization requirements for functioning agricultural credit unions have proven difficult to meet. As an example, the World Bank’s evaluation for Georgia: “Ten credit unions were set up at the outset. At first, they performed well. Encouraged by this success, the central government made pre-election promises that there would be ‘a credit union in every village.’ In 1998–1999, 164 credit unions were created, with 12,231 members. The network expanded so rapidly that sustainability was compromised.” By 2008, only seven credit unions survived, of which just two were deemed viable. The evaluation concluded that “these projects have shown that small village-based credit cooperatives are not an appropriate mechanism for large-scale credit delivery” (World Bank, 2010).

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into which EBRD and IFC have entered, banks go little further than this. They learn how to segment borrowers into different categories, such as small ones who only require some “social endorsement,” and larger ones who can be organized into joint liability groups and other large borrowers who are required to provide collateral and submit proper business plans. They learn about group lending and using collateral, and are helped to install procedures to monitor loan performance and enforce collateral.

But credit scoring does not remove the risks from agricultural production and trade due to external factors such as price developments or weather events, not to mention risks related to government policies or commercial counterparts. Empowering banks not just to quantify, but, more importantly, to manage such risks is critical to enhancing their capacity to lend to agriculture. How much can be done in this regard depends on the specific bank, but at the very least, banks need to be taught how to be proactive in managing the most basic production risks. For instance, they need to ensure that borrowers use the proper chemicals to treat their crops or, if they finance livestock, that good veterinary services are available for the animals that they finance. It is unwise to finance non-vaccinated animals. If the necessary service providers are absent in the country, the bank should make it a priority to create them. Another relatively simple risk management measure is to control the use of at least part of the loan. For example, if it is meant to pay input providers, banks can pay directly against the invoices of such providers rather than just disbursing the funds to the borrower.

But it is advisable and feasible to move beyond the most basic risk management. Fortunately, structuring a financing transaction in such a way that risks are appropriately mitigated is a systematic process. Annex 7 provides a step-by-step approach, and the remainder of this chapter will discuss some possibilities. When applied to specific sectors or to specific lending methodologies, blueprints emerge. There are guidelines on how to manage a factoring programme which are particularly useful for small and medium-sized enterprises (SMEs); how to start leasing agricultural machinery; or how to finance the cotton value chain or soybean processing. As local banks are expected to generate and structure agricultural financing deals, training should be refocused away from a credit scoring philosophy and boosted to inculcate a strong culture of structured finance, where there is understanding about risks and the tools to mitigate them. Banks need to be building loans around the strength of the transaction structure rather than on the strength of prospective borrowers. And training should extend from classroom-type instructions to hands-on development of transaction structures, including the implementation of operational mechanisms to manage ongoing transactions.

Second, there is a large scope for wider use of proven instruments. Partner financial institutions should be given access to a large toolkit. One may take the case of agricultural microfinance. Microfinance programmes exist throughout the transition region, generally run by NGOs. They tend to rely on a combination of credit scoring, group guarantees and assessment of business plans. There appears to be great scope for a more direct management of risk in such microfinance schemes. Some interesting ideas for this strategy can be found in India. Annex 12 describes how BASIX, an Indian microfinance bank, on evaluating its programme, found that it was underperforming because its borrowers faced three sets of major problems: unmanaged risk, low productivity and unfavorable terms in input and output market transactions. The bank then decided to tackle these problems directly by introducing new product offerings that would systematically mitigate these problems.

The results were lower lending risks and new revenue sources for the bank, and a much improved impact of the bank’s operations on its borrowers. Apart from the usual microfinance loans, BASIX now provides various forms of insurance, including weather index insurance, veterinary and extension services, capacity-building programmes for farmers’ groups, support to contract farming schemes and price information. It has experimented with WHR finance and price risk management. The broad approach adopted by the company and its success in improving

79 Szabó (2005) gives an overview of loan guarantee schemes in a number of transition countries.
livelihoods by delivering an integrated range of agriculture-related services may inspire the approach of microfinance banks in the transition region.

Third, credit support institutions should be strengthened. There are many transaction structures where a bank is best off relying on a third party: the required skills are specialized, and an additional level of checks and balances is created. Examples are veterinarian services for livestock, or collateral management. Collateral managers are virtually absent in transition countries. There are no EWR systems. Specialized insurance from weather index insurance to the insurance of warehousing companies is poorly developed, and inspection agencies offer only a limited range of services. International organizations may consider setting aside a part of the funds that they wish to provide to local banks to develop credit support institutions. As noted before, at least some of these support elements are cheap. Setting up an EWR system (with the wide range of operations set out in Annex 6), for instance, would cost less than one percent of a typical EBRD credit line to a local bank. While the model pursued by some Latin American countries and Turkey, namely for banks to set up their own collateral management firms, may not be the best suited for transition countries, partner banks of EBRD and IFC could be encouraged to jointly fund the creation of a regional collateral management firm.

Fourth, banks work best if they are part of a more complete financial environment, ideally operating alongside investment funds of various stripes as well as a multi-asset exchange where they can refinance themselves and recalibrate their risk exposure. Investment funds can focus on venture capital, on bringing firms to a higher level or on trade finance. What matters here is that their activities benefit from and feed into bank business. For example, venture capital can make a firm advance to become a bank client. A fund investing in trade finance can be a syndicate partner for a bank: in emerging markets, local banks often are averse to creating syndicates between themselves. Venture capital can also finance innovative transaction structures until these have set a track record which will inspire banks to come in. With respect to exchanges and similar platforms (e.g. alternative trading systems), improvements in information and communications technology have made the introduction of platforms for trading financial and commodity assets much easier and cheaper, and well within the affordable range for most transition countries. International organizations should consider how they can support proposals from private sector groups to form agricultural investment funds and trading platforms to complement their ongoing commitments to local banks.

4.2 A closer look at instruments and structures

Each borrower is different, and risks change as commodities move through the value chain. Each financier has a strong incentive to select finance structures that fit their own needs as well as those of a specific borrower. It is a logical outcome of this process that one can find a wide variety in structures. Figure 8 gives a stylized overview of innovative structures that can be used to reach the different players in the agricultural value chain.
Figure 8 describes what could be possible if commodity exchanges and banks were able to optimally link agriculture and financial markets. Farmers, input providers and traders could move their inventories into exchange-controlled warehouses, where they can be graded and the rights to finance them auctioned off among interested financiers. Goods in processors’ warehouses can be guaranteed by collateral management agencies, and similarly become the underlying basis for issuing securities. For example, in the United States of America a cooperative has issued securities with grains in its elevators as the underlying guarantee. Commodities in the field, that is, those crops that have yet to be harvested, can become part of structured finance schemes, as can farmers’ outstanding payments with input suppliers and traders. Ultimately, these schemes hinge upon future sales by farmers through an organized mechanism, such as an auction, or to a specific buyer or processor. Again, these can be securitized. Even the provision of infrastructure for farmers, like those for irrigation, cold storage or processing, could be securitized if made part of such structured schemes. This provision has been achieved in sub-Saharan Africa, so there is no reason to believe that it would be out of reach for transition countries.

Furthermore, if farmers’ inventories and sales are registered through a central system, like that of a commodity exchange, a database of farmers’ individual track records will be built up. This database can form the basis for medium- to long-term credit schemes, which, again, can be securitized. And when traders and processors sell on credit, they can sell the resulting receivables to a securitization vehicle, which allows them to receive prompt payment against their issuance of invoices. This is an ideal picture, of course, but banks and others can gradually work their way towards it.

Where legal and regulatory frameworks are not yet conducive to the more advanced forms of agricultural finance, and support agencies are lacking, financiers can still structure relatively sound financings by the systematic identification and mitigation of risks. Annex 7 gives a brief step-by-step overview of the methodology. The risks to which financiers are exposed pre- and post-harvest differ sharply. In pre-harvest finance, uncertainties include:

- Will the farmer produce the expected volume?
- Will he realize the anticipated price?
- Will he use his earnings to reimburse the loan?

In post-harvest finance:

- What is the value of the goods financed?
- What is the risk of these goods being lost, stolen or diverted?
- When payment for the sale of the goods is received, will the borrower use this to reimburse the loan?
4.3 Pre-harvest finance

4.3.1 Trust in the farmer’s willingness to reimburse the loan

In transition countries that have entered into the EU, banks have largely adapted the agricultural finance practices of western Europe: they provide working capital finance to farmers backed by mortgages or pledges over land and real estate. They take no measures to secure the farmer’s earnings, or to establish priority claims over these earnings. This form of finance is easy both for banks and for farmers, but replicating it elsewhere is difficult. In effect, such finance is possible only because of the conditions that prevail in these countries:

- the EU provides a safety net for many agricultural prices;
- there are official transfer payments to further secure farmers’ incomes;
- the identity of the farmer, his past credit record and his ownership over his farm can be easily established;
- should it be necessary, the bank’s rights can be reliably and speedily enforced through the courts;
- title over the land and real estate is clear and pledges thereon are registered, with very little possibility of dispute and in the case of a farmer’s default the bank can seize the land and sell it; and
- there is an open market for land so that the bank can realize a fair price upon the sale.

In this form of agricultural credit, the bank takes a call on the farmer’s business prospects, and uses a land/real estate mortgage as his only collateral. However, the bank’s willingness to do so is dependent not just on his understanding of the farmer’s business or the legality of a farmer’s pledge of land/real estate, but on a whole set of other conditions. Efforts by governments, supported by the international community, to train bankers in understanding farmers’ business plans or to establish clear titles over land are certainly useful in their own right, but one cannot expect that this suffices for the development of an agricultural credit market. Thus, the agricultural finance mechanisms of the transition countries that have entered the EU hold few replicable lessons for other transition countries.

4.3.2 Make equipment available, not money

After the break-up of the Soviet Union, many farmers needed new farm equipment. The equipment pools of the old state and collective farms were either not available to new farms, or in need of replacement. Setting up leasing schemes was an evident solution, albeit facing the obvious obstacles including legal issues such as whether there is a clear difference between ownership and use, tax issues with leasing payments, the difficulties of enforcing regular lease payments, practical and legal difficulties in recovering leased equipment and a weak secondary market for recovered machinery. Nevertheless, leasing schemes can now be found throughout the region.

In several transition countries, such as Belarus, Kazakhstan, the Russian Federation, Ukraine and Uzbekistan, the leasing of agricultural machinery was driven by government bodies. Early efforts were not always successful. In the 1990s, the state leasing company in Kazakhstan collapsed, as did the privatized agency for machinery supply in agriculture in the Russian Federation, but governments kept up the efforts. The state leasing companies generally provide long-term leases of five to seven years at subsidized or low rates. They usually target large farms. For example, the Russian Federation’s Rosagroleasing provides contracts in the range of EUR 300 000 to EUR 50 million.\[81\] In some of these countries, private leasing firms have emerged, often attached to commercial banks or agricultural machinery manufacturers and dealers. Independent leasing companies and branches of international leasing firms have also developed. However, as they generally rely on local bank funding their terms are less attractive than those provided by state leasing agencies.

International agencies have supported the development of agricultural leasing in several countries. USAID and other US government agencies have helped set up leasing companies in Armenia, and supported agricultural leasing in Georgia. EBRD has provided facilities to leasing companies targeting SMEs in a large number of countries. In some of these cases, the companies include agricultural equipment leases

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81 Serova and Prikhodo, 2010.
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among their products. In other countries, such as Romania and the Russian Federation, EBRD has supported leasing programmes specifically targeted at agriculture. In Central Asia and Azerbaijan, Hungary and Mongolia, technical assistance and financing facilities provided by IFC, including investments in leasing companies, fostered the development of companies’ leasing skills and of a sound legal and regulatory system. These included the exemption of leasing interest payments from value added taxes.

Programmes were generally successful and leasing in these countries has since developed rapidly. Agricultural equipment leases formed part of the product range, and IFC is making efforts to promote the downsizing of such leases. In Tajikistan, for example, it is linking up with a microfinance bank. This approach of bringing agricultural leasing as a new product to MFIs, or “micro-leasing”, is well worth replicating in other transition economies.

4.3.3 Ascertain farmers’ likely production

Banks may be willing to provide unsecured credit if they have reliable records on individual farmers’ credit and production history. Governments can help here, as is the case in the Russian Federation. There, regional offices of the Ministry of Agriculture certify how much seed a farmer has sown. These certificates give banks a certain measure of confidence in a farmer’s likely future production; enough to finance as much as 30 percent of the likely future value of their crop.

Several countries have organized systems for registering loans. In Kazakhstan, such registration may even spell out for what purposes such loans can be used (e.g. to pay diesel suppliers). Initiatives of this nature deserve replication.

Another possibility is for a bank to develop agricultural expertise. A bank in the Philippines that has built a successful niche in innovative agricultural finance has more agricultural engineers among its staff than credit officers. It explicitly ties its willingness to continue

financing farming operations to productivity targets. In its credit scoring methodology, a farmer’s productivity is a key factor, and maintenance of this productivity a condition for renewal of funding. It is useful to keep this concept in mind. There are few things more supportive to successful innovation in agriculture than profitable agriculture.

4.3.4 Rely on the pledging of future production

The legal framework of some transition economies permits farmers to assign rights to future harvests as collateral for loans. In Ukraine, for example, the law on pledges sets out the procedures, which generally stipulate that pledge agreements are notarized and registered with the relevant state registry. Other countries also have pledge laws. These should be reviewed to ensure registration requirements are not unduly cumbersome or expensive and future assets can be pledged. In some cases, only clearly identifiable assets are permitted to be pledged, which excludes future crops. But even when pledge laws are well-formulated, banks are only likely to accept pledges of future crops as collateral if the farmer has a well-established track record.

Pledges of future crops form the basis of pre-harvest finance in Brazil, and act as the key building block for a series of more complex instruments that tightly knit agriculture and finance together. This relationship is discussed in more detail in Annex 10. Section 4.3.2 discusses potential issues with respect to introducing similar instruments in transition economies.

4.3.5 Rely on loan guarantees by third parties

In many transition countries, donor agencies have established guarantee schemes for bank lending to rural sectors. For example, USAID encourages its local missions to support sustainable lending programmes to micro, small and medium-sized enterprises through the provision of Development Credit Authority (DCA) loan portfolio guarantees. In these guarantees, DCA takes half of the credit risks. This revolving guarantee scheme in which individual transactions continue to be guaranteed as long as there are sufficient uncommitted funds in the guarantee scheme, has been frequently used worldwide, including in 17

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83 Tax treatment is a problem for leasing in several countries. For example, in Tajikistan, imports of agricultural machinery are VAT-exempt, but imports of the same machinery by a leasing company are subject to 18 percent VAT.
84 See Goldberg and Palladini, 2010; and Kennedy, 2010.
85 Winn et al., 2009.
transition economies. It is often associated with technical assistance, to enhance partner banks’ understanding of new financing tools such as factoring or WHR finance.

Agricultural loan guarantees have, at best, a mixed record. DCA typically makes a loss on its guarantee schemes, but considers the loss as a grant element and argues that so far, in terms of positive impact on development, this has been an effective use of grant funds. Losses from the agricultural part of its portfolio are higher than the DCAs average losses (i.e. three percent versus one percent). As EBRD, IFC and a number of bilateral agencies are expanding their loan guarantee programmes to banks, due care should be given to the proper structuring of such programmes to maximize impact and reduce possible losses. Accompanying loan guarantees with a robust technical assistance package is a must. Guarantee programmes have to be time-bound. That time could be long, for in some developed countries guarantee schemes have been in place for as much as 30 years before it was deemed that commercial banks were sufficiently familiar with agricultural lending and no longer required them. It is also essential to formulate at the outset the expected outcomes of a guarantee programme not just in terms of new credits, but also in terms of behavioural changes by the client bank and other banks in the country. Then, they need to monitor actual performance with the possibility to intervene if results are not as expected.

4.3.6 Rely on group guarantees
In a typical microfinance approach farmers form groups. Each farmer borrows individually, but his loan performance is guaranteed by all of the farmers in the group. There are many institutions providing microfinance in transition countries, and they are actively involved in rural lending. Some have become successful agricultural lenders. For example, despite significant legal constraints, Kyrgyzstan’s Bai Tushum Financial Foundation and Kyrgyz Agricultural Finance Corporation have developed successful agricultural loan programmes, including those for preharvest finance. As the microfinance industry has come under criticism for not creating enough real value with its traditional financing of small-scale retail or processing activities, expansion into agricultural microfinance is an evident response. The particularities of agricultural microfinance are now well-known, and organizations such as EBRD may consider how their lending or guarantee activities for bond issues by microfinance banks (not for the banks’ loan portfolio) can boost the practice, including through new tools such as microleasing.

4.3.7 Capture the farmers’ earnings through the buyer
When farmers have little choice but to deliver through a single marketing channel, such as through a processor (e.g. cotton, dairy, livestock, sugar), an auction system or a government trade monopoly, banks can use this as a reimbursement mechanism. A similar possibility exists when farmers have strong financial incentives to deliver to a particular buyer such as a supermarket that may pay premium prices for high-quality fruits and vegetables, or a baby food manufacturer willing to pay well for high-protein soyabeans. Upon receiving the loan, the farmer assigns priority rights over his earnings to the bank, and informs the marketing channel agency accordingly; on later sale of the goods, this agency/company deducts the payment due to the bank before paying the remainder to the farmer. This system, used in the Tajik cotton sector, enables farmers to select input suppliers themselves; but there is a risk of credits being diverted for non-farm purposes.

86 USAID, 2010.
87 For a list, see Pytkowska, 2008.
4.3.8 Shifting credit risk to processors and traders
Instead of lending to farmers, banks can lend to processors and traders who will then provide farmers with the inputs they need, on credit.90 Farmers’ bargaining power under this mechanism is weak. The experience in transition economies has been that often very high interest rates were demanded under this form of pre-harvest finance (i.e. paying high input prices and receiving low output prices). Nevertheless, as long as arrangements can be made to safeguard the interests of farmers, this form of finance has great potential. From the bank’s perspective, there is only one large borrower, so the administrative burden is reduced, compared to having many individual farmers as clients. The processor or trader will tend to provide a large part of his credit in kind,91 benefitting from lower prices because they can buy in bulk. The processor/trader is best placed to allocate the credits appropriately, depending on individual farmers’ production capability. Farmers may benefit not just from credits, but also from extension services, marketing contracts with guaranteed minimum prices and other contract farming arrangements. Thus, they are likely to sell through the processor/trader, ensuring that the bank gets reimbursed.

Arrangements of this nature are widely used in transition countries, including with funding from international traders, banks and organizations.

4.3.9 A case study: organizing cotton finance through a new farmers’ organization – the experience of SugdAgroServ, Tajikistan
Tajikistan went through a prolonged period of civil strife from 1992 to 1997. Thereafter, institutions needed to be rebuilt to fuel economic growth. The cotton sector was one of the priorities. At the time, cotton accounted for more than a quarter of GDP and employed two thirds of the labor force. It was and remains the second largest export product after aluminium.

Cotton production is input intensive compared to many other crops, and requires significant pre-harvest finance. As a result of the civil strife, state input supply and finance organizations had collapsed, and the sector had become dependent on private sector financiers, called futurists (as described in section 1.3). To create an alternative mechanism, IFC together with the Swiss Secretariat for Economic Affairs (SECO) decided to support the creation of a farmer-owned enterprise.

In April 2002, in the Northern Sugd province of Tajikistan, 365 farmers established a closed joint-stock company called SugdAgroServ (SAS) together with IFC and SECO. The farmers together contributed USD 1 472, and the two others invested USD 250 000 each. SAS works in four areas92:

- **The provision of working capital and investment loans**: Working capital loans are available for up to 14 months. Loans for the purchase of fixed assets such as agricultural machinery or irrigation pipelines, or for cattle breeding were for up to three years. Interest rates were set two to four percent below those of Tajik banks (i.e. it was not structured as a microfinance organization).

- **Marketing services**: SAS markets cotton on behalf of its members, including with traders in Kazakhstan, the Russian Federation and other countries.

- **Sourcing and sale of input**: SAS procures fertilizers, chemicals, petrol and diesel fuel, and, to a lesser extent, seeds. It provides these to its own members, and sells them through a shop to other farmers.

- **Technical assistance**: To member farmers to improve product quantity and quality.

In its first two years of operation SAS was very successful. It had a good return on equity, and a loan portfolio of some USD 800 000 with 110 clients. It marketed over 1 500 tonnes of cotton. In 2004, IFC and SECO injected additional resources that permitted the expansion of SAS to over 1 000 members, and the new shareholders brought in another USD 19 000 for their shares.

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90 This approach is akin to the old Soviet system, as is still operational in Turkmenistan and Uzbekistan. Farmers have to supply their crops to monopoly state-owned buyers, but are in return supplied with subsidized inputs, equipment and services on credit reimbursable from the proceeds of the farmers’ sales.

91 This setup is not primarily to make a margin on supplying fertilizers, seeds, diesel and the like, but to ensure that funds are not diverted. Farmers are often under large financial pressures, and if they are given cash they may use much of it to meet immediate consumption needs. A combination of credit in kind with some cash to avoid the likelihood that farmers will sell part of their fertilizers etc., works best.

92 Hess et al., 2005a.
But then, problems started. In 2004, the world cotton price fell by 45 percent, and, in addition, Northern Tajikistan was hit by a drought that caused yields to fall. At the end of 2004, SAS found that 40 percent of its by then USD 1 million loan portfolio was in default. In 2005, SAS was close to financial collapse. Analysis of the situation showed a number of deep-seated problems. Perhaps inspired by the experience with credit programmes in the former Soviet Union where every five to seven years, loans were forgiven, “farmers did not quite perceive the difference between ‘loans’ and ‘grants’.”

The board members of SAS had improperly used their position to obtain loans and were often delinquent in their obligations. It proved necessary to purge the board of defaulters, and to pursue them in court.

This action helped reverse the situation. Policies were changed, with a new rule requiring notarized collateral for loans of more than USD 2 000. A special approval process was introduced for loans to board members; and it was decided to diversify into non-cotton lending. IFC and SECO intensified their business management training activities for farmers. SAS survived and became a healthy, profitable and growing organization.

As far as the Brazilian experience suggests, a number of conditions are essential for creating trust in the promises that are implicit in CPRs. Thus, any effort to introduce CPR-like instruments in transition economies should include actions to replicate these conditions:

- Various registries help prevent farmers from “over-promising.” CPR buyers can check whether farmers own enough land, whether they have made other pledges and whether farmers’ assets are mortgaged to any financiers. The introduction of a (preferably electronic) registry encompassing land ownership, farmers’ mortgages and pledges over crops is essential for the introduction of CPR-like instruments.

- An electronic system for trading CPRs and instruments based on them – similar to the corporate finance, Brazil’s large-scale experience in extending the commercial paper programme to farmers is unique. The regulatory framework for this commercial paper, called Cédula de Produto Rural (CPR literally “rural product note”), was introduced in 1994, and over the years has been extended to include new forms of CPRs as well as various other products based on them. Annex 10 provides extensive discussion of the system.

CPRs are bonds that can only be issued by farmers and farmers’ associations, including cooperatives, by pledging an agreed amount of crops (including in semi-processed form) or cattle, in return for financing. Essentially, the CPR is a promise by a farmer to a CPR buyer to deliver a certain quantity of crop/cattle or to make a certain payment at a specific time in the future. The buyer is willing to make an immediate payment for receiving this promise.

It is the willingness of the CPR buyer to make such immediate payment that is crucial. If the political will exists, it may be relatively straightforward to introduce the legal and regulatory framework for CPRs. But if the complementary conditions to create trust are not created simultaneously, the newly created instruments will hardly be used. The Brazilian experience also shows that there are a number of factors that, while not necessarily critical, contribute significantly to the development of CPRs.

As far as the Brazilian experience suggests, a number of conditions are essential for creating trust in the promises that are implicit in CPRs.
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EWR system discussed elsewhere in this report – eliminates many potential risks, and thus creates trust in the CPR system. In addition, it reduces transaction costs.

- The legal system provides for a high level of security; CPR-related claims have priority over other claims (even in the case of bankruptcy). Force majeure is not a valid excuse for defaulting on CPR-related obligations, and in case of dispute there is a rapid out-of-court dispute resolution process. In addition, Brazilian courts are familiar with bonds in general, and do not negatively intervene in the out-of-court process. Creating similar legal protection may be the most difficult aspect of introducing CPR-like instruments in transition countries, yet it is essential. It will require not just the introduction of a suitable legal and regulatory framework for the CPRs themselves, but also efforts to work with the judiciary to ensure that judges understand CPRs and will not undermine their functioning.

As the Brazilian experience indicates, the following factors are supportive for introducing CPRs:

- Much of the drive to use CPRs did not come from banks, but rather from channel partners of farmers who had strong commercial reasons to build credit relations with farmers such as input suppliers for whom this was the best way to sell inputs, and processors/traders for whom it was a good way to secure future supplies. In the absence of CPRs, in many cases these companies would have provided finance anyway (e.g. by selling inputs on credit, or pre-financing forward contracts). However, CPRs gave superior legal protection. This fact suggests that if CPRs are introduced, they are most likely to be used in already-established value chains, and it is advisable to focus initial efforts to establish CPRs on such chains and the channel partners involved.
- It has been important for the buyers of CPRs that Brazil’s regulatory framework gives them easy options to refinance the CPRs, through banks and the capital market. Several instruments have been created for this purpose. These have benefited both the agricultural sector and investors, and have ensured that lack of credit/finance capacity has not been an obstacle to the development of CPRs. It is advisable that when CPRs are introduced, instruments to link CPR-based finance to the capital market are also envisaged. Together with the relevant financial regulation agencies, an effort should also be made to conceptualize and develop the mechanisms to trade such instruments over-the-counter or, preferably, on organized exchanges.
- The existence of monitoring agencies that can verify the behaviour of farmers, and processors issuing bonds similar to CPRs, have added further trust to the system. They give the bond buyer confidence that the bond seller is, indeed, using the funds for the planned activity, and give hands-on control during the critical period. For example, during harvest time the monitoring agency can make sure that each day the pledged goods are, indeed, going to the agreed buyer. The creation and strengthening of such agencies merit support as a component of a programme to introduce CPR-like instruments.
- CPRs and similar instruments have benefited from favourable tax treatment.

While CPRs are valuable tools, the fact that they remain based on trust in a farmer’s promise implies that, they are more likely to benefit well-organized medium- and large-size farmers rather than small and unorganized ones, as is the case in Brazil. They may be a good tool for agricultural development, but they are not a priori well suited to target the poorest farmers or poverty alleviation in general.

4.4 Post-harvest finance

Cost effective post-harvest finance is necessary both to strengthen farmers’ bargaining power vis-à-vis buyers, and to ensure a proper flow of goods from farm to fork. Finance can be provided to producers, processors or traders. Banks may provide unsecured finance to “good” corporate names, but otherwise will look for security in the supply chain. They have several tools at their disposal.

4.4.1 Control the good

Financiers, including banks, investment funds or trading companies, can obtain control over the
crop once it is harvested and provide finance against this security. There have been many programmes over the past two decades to promote this kind of finance; this is considered in some detail in the section on WHR finance. As discussed above, many banks have participated in financing using WHRs on their own initiative or under the EBRD WHR programme which is in operation in many of the transition economies. The large banks provide financing against WHRs predominantly using their own funds. WHR finance is not without risk. There have been cases where a bank found that the elevator was empty after it tried to take possession of grain evidenced by WHRs when its borrower had defaulted. While the bank then has recourse to the elevator company, this may only be a meagre consolation as the elevator may be weakly capitalized and not “bonded” (i.e. guaranteed by a specialized insurance company).

In certain cases, banks may not require full control over the crop as it moves down the supply chain, but, instead, just need up-to-date information. For example, Société Générale de Surveillance has introduced an Internet-based tool that allows grain trade financing banks to monitor on a real-time basis how grain moves into and out of silos, railway cars and ships during critical phases. While the bank does not have collateral control over the grain, it can quickly identify discrepancies and intervene to safeguard its interests as needed.

### 4.4.2 Control the farmers’ local receivables

Buyers may insist that their suppliers deliver their produce on 30–90 day credit terms. This agreement is the typical purchasing mode of supermarkets, for example. There are also processors who make deferred payments. Consignment sales, which are fairly common for fruits and vegetables, similarly lead to payment delays. In the case of deferred payments, factoring operations can enable sellers (i.e. farmers, cooperatives) to obtain ready cash. Factoring and the related practice of forfeiting are standard in developed market economies as well as in international trade, including for sales to transition economies. Indeed, they have been growing fast in some transition economies. In countries like the Russian Federation, the legal framework fully supports factoring, as a “purchase of invoices”, and several large factoring companies have come up as a result. Since 2007, EBRD has supported factoring in Georgia, Republic of Moldova, Romania, the Russian Federation and Ukraine through its Trade Facilitation Programme. It may be worthwhile for EBRD to consider how, within the framework of value chain financing for the agricultural sector, factoring can help improve the flow of capital. It can also work with its partner factoring companies to strengthen the relevant product lines and, where relevant, introduce new agriculture-specific factoring products (e.g. working with supermarkets).

### 4.4.3 Assign export receivables

If there is an export contract, a bank can provide a pre-export loan on the basis of the assignment of the export proceeds (i.e. once the financed goods are exported, the buyer pays the bank, which then transmits the sum that remains after payment of the loan to the exporter). This mechanism has been extensively used for large-scale grain exports, from Kazakhstan, the Russian Federation and Ukraine. A separate section discusses the Kazakh experience. In transition economies, this financing form is most often found in the mineral and energy sectors. In agriculture it has been mostly used for large (USD 20 million plus) grain, oilseeds and cotton deals. Thus, there is a fairly large scope for expansion into agriculture, including for south-south trade and for perishable commodities such as fruits, flowers and vegetables. However, a USD 5 million deal may require as much, if not more, work than a USD 100 million deal. Therefore, smaller deals would be more attractive for local and regional banks with a lower cost base than for international banks. To enter into this market, however, local banks need to build up the necessary appetite and expertise.

### 4.4.4 Ownership-based financing structures

The main tool of ownership-based financing is the repurchase or repo contract. In a repo, rather than taking a pledge over the goods being stored or shipped, the bank actually buys the goods. It simultaneously signs a contract for resale in a pre-set period of time at a price that reflects the cost of funds from the original time of sale to the resale. This arrangement provides much greater legal protection to a
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financier than the use of a pledge. However, the financiers remain exposed to risks related to the warehousing and transporting companies involved in the transaction, and also take on new risks related to ownership such as liability in case of environmental damages. Repo contracts have been used in Poland, the Russian Federation and Turkey. Rabobank, for instance, has used repos mostly in the sugar sector, but had to face a considerable loss in at least one case, in the Russian Federation, due to disappearance of the sugar. Nevertheless, there are possibilities for replication in other transition economies, particularly in Central Asia, as this mechanism perfectly replicates the standard Islamic financing form of Murabahah. Indeed, in 2010, an arm of the Islamic Development Bank structured a USD 40 million Shariah-compliant facility for a Kazakh wheat exporter, using WHRs as support.94

It follows that, in many transition countries, there is scope for the introduction of repo contracts, depending on specific conditions such as tax systems and the reliability of warehouses.

Legally, repo contracts are not loans, but purchases and sales. They can thus be subject to value added taxes (VAT). VAT has posed a problem in the use of repo-based finance in the Russian Federation. Banks such as Rabobank had to set up special vehicles, including the prefunding of VAT payment, to deal with this issue. VAT reimbursements in the Russian Federation are sufficiently reliable to make this work, and the financing worth enough to make the process worthwhile, but this is not necessarily the case in other countries. Another problem is that, as the bank is the owner of the commodities, it is fully exposed to all risks associated with ownership: the goods being damaged or stolen, or involved in some form of accident (e.g. leakage of vegetable oils leading to environmental damage). Furthermore, the price setting in repo contracts can be complicated. In case of a dispute, if the price is set too low, a court may decide that there was no "true sale," depriving the bank of its priority rights over the commodities. If the price is set too high the counterparty may default on his repurchase obligations. To deal with this risk, a conditional offtake contract is often signed with a reputable international buyer.

Overall, international agencies may wish to act carefully when it comes to advocating the replication of repo financings. Few local banks may have the sophistication to manage them properly. On the other hand, repos can also be traded on commodity exchanges, which merits further exploration. An example of this option is the case of Colombia, discussed below.

4.4.5 Rely on third-party guarantees

To finance exports, one may benefit from official export credits or credit insurance. But in transition economies, the offer is still limited. By and large, export credit agencies only started to be created in transition countries in the second half of the 1990s. Central and Eastern European countries set up new entities, and the larger countries in the FSU – Kazakhstan, the Russian Federation and Ukraine – converted existing banks into export credit agencies. The means put at the disposal of these agencies, however, remained limited, and they have been largely earmarked for manufactured exports. Multilateral agencies such as the EBRD and IFC have, to some extent, filled this gap, and some south-south trade in agricultural products has been made possible by this support. Nevertheless, agricultural exporters from transition countries can generally not count on the ready availability of export credit insurance or guarantees. It may be useful to engage these national export agencies to open windows for financing agricultural trade.

4.4.6 Financing processors

Several structures have been used to finance processors in the difficult period after the break-up of the Soviet Union. One was the buy-back arrangement. A form of countertrade used for refurbishing processors, the equipment supplier was paid over several years either with products produced by his equipment, or with part of the export proceeds of these products. This arrangement was a risky form of finance, and was only used when an international firm entered into a joint-venture with the local counterparty. Another form was tolling. In this case, the processor was paid a fee for processing raw commodities that are bought, handled and

94 Details on the structure of the deal can be found in Islamic Trade Finance Corporation (ITFC), Progress Report on ITFC’s Role in the Promotion of Intra-OIC Trade, 27th Meeting of the Follow-Up Committee of the COMCEC, Ankara, Turkey, 1-2 June 2011.
financed by a third party, such as an international trader. This form is an attractive solution for processors who do not have sufficient capital to buy all the raw materials they require for full-year operations. In transition countries, tolling has been particularly important in the sugar and vegetable oil industries, but also very significant in the production of flour. These are particularly useful financing solutions in crisis situations. But while financing structures of this nature may still be useful under certain conditions, there is little value in international organizations promoting their use.

4.4.7 The mixed experience of finance in the Central Asian cotton sector

Cotton exports have benefited from structured finance for many years, but the track record is mixed with negative experiences in the Kyrgyzstan, Turkmenistan and Tajikistan, and a positive experience in Uzbekistan to date.

In Turkmenistan, exports remained in state hands. The state company, while receiving prepayments, regularly defaulted on its delivery obligations with international cotton traders. In 1996, the Central Bank had to pay out USD 80 million because it had guaranteed performance, and the Ministry of Agriculture was blacklisted at the Liverpool Cotton Exchange. In Kyrgyzstan, in the latter half of the 1990s, cotton ginneries provided finance to farmers, and were themselves financed through prepayments from international traders. But in 2000, cotton ginneries became the target of money-laundering activities, resulting in a default on international obligations; prepayments thus stopped.

In Tajikistan, in early 1998, a major cotton trading company, Paul Reinhart A.G., through a consortium of banks led by Credit Suisse First Boston, granted credits totalling USD 77 million to Tajikistan’s Agroinvestbank, in which Reinhart at one time owned a majority stake. Agroinvestbank then loaned the money to local cotton traders/ginners, called “investors”. Sources give varying estimates between 11 and 100, as to their numbers. Each investor was allocated, through informal means, a monopoly area. In this area, he provided credit to local farmers, mostly in kind, in the form of fuel, fertilizer, pesticide and other inputs, with some cash advances for salary payments and machinery repairs.

The funds were mismanaged, with the investors appropriating massive rents because of their regional monopolies, while the farmers received only a quarter of the export price. Farmers were forced by the government to continue producing cotton, under production quota; failing to do so could lead to the loss of their land use rights. The poor fund management combined with falling world market prices rapidly caused a loan default. The 1999 campaign saw a major financing shortfall, which led to severe input shortages. This fact, compounded by poor weather, caused a major reduction in the cotton harvest. The loan was rolled over in consecutive years, but the situation did not improve. The debt burden only increased to USD 150 million by mid-2002. The cotton sector did not manage to escape its problems, and despite further rescheduling, the loan went into default. When, under an IMF programme in 2004, the cotton debt was taken off the books of the by then insolvent Agroinvestbank and transferred to a non-banking financial institution called “Kredit Invest,” it amounted to USD 260 million.

While this Tajik cotton finance had the characteristics of a structured pre-export financing, the loan structuring was amateurish. In a properly structured deal, the financier secures the asset conversion cycle, from finance to commodities and then back to finance again. He ensures that the funding is, indeed, used to produce and process the commodities, and that these are then transported...
and sold to a buyer whose payments will settle the loan; and he builds in a series of risk mitigants to prevent, to the extent possible, any disruption to this asset conversion cycle. He also takes insurance to cover the potential loss.

In contrast, in this transaction, it was left up to the investors to decide how funds would be used. Very little was done by the financier to ensure that funds would be properly utilized. Consequently, funds were diverted, fertilizers delivered late, loans to pay wages were provided too late, costs of inputs and services were inflated, etc. Furthermore, there was no coverage of production-related risk. As investors paid such low prices, many farmers diverted inputs to other crops that they could sell independently, and price risks were not managed properly. There was a price hedge in place, but this did not secure the farmers’ margins. The financier might have relied on a government guarantee but in practice, in a country with serious hard currency constraints, if a loan does not lead to hard currency earnings – that is, if cotton export revenue is too low – it is very difficult to enforce such a guarantee.

With proper structuring, all of these risks could have been managed, and if Tajikistan learns from international best practice there is no reason to repeat the earlier experience.

Uzbekistan has had a more positive experience with structured finance. While cotton is produced by a large number of small producers, it is effectively controlled by the government. Each year, a state body, the Uzbek Association of Cotton Industry, enters into procurement contracts with farmers, and the state makes advance payments to the farmers for up to 50 percent of the contract price, which tends to be very low compared to world prices. The association then processes the cotton and delivers it to large state trading organizations. Several structured finance transactions have been built around cotton export flows. For example, in 1997, a German bank structured a prepayment structure in which the foreign buyer prefinanced the export company a percentage of the forecasted contract value of cotton it was to buy under an annual export contract. The National Bank of Uzbekistan guaranteed the performance of the export company. In later years, the transaction structure became more complex, combining cotton pre-export finance with warehouse financing. This supply chain financing covered the period from prepayments to the Uzbek exporter which was guaranteed by the National Bank of Uzbekistan, transportation to and storage in third party warehouses in Latvia and Iran (on the basis of WHRs) until the export sale to and receivables from final buyers. Payment risks were covered through credit insurance on the buyers. The bank actively monitored the flow of the goods from the gin in Uzbekistan (the country has effective pledge laws) until arrival with the spinning companies.

4.5 Possibilities for replication and innovation – tools for and lessons from the region

While copying a structure from one commodity sector to another, or from one country to another, may not work, structures that work well in one case should provide inspiration to others. Globally, as well as in the transition countries, one can find many examples of deal structures that, if properly adapted, may function well in certain transition countries and can provide practical solutions to the financing needs of commodity producers, processors and traders. Given that international banks tend to concentrate on large-scale transactions and that many of the financing needs in the agricultural sector are below their usual threshold, it falls largely on local and regional banks in transition countries to learn from international experience and to structure financing solutions for their own regions.

Structured commodity and trade finance is considered by financiers a low risk area, compared to other forms of bank lending. Thus,

99 The percentage paid was high – as much as 90 percent – because the financier put full trust in the Advance Payment Guarantee of the National Bank. In a pre-export financing in 1997/98, by Standard Bank, the Bank called on the guarantee following a contractual dispute between the international trading company and the Uzbek exporter, and was “duly paid within a few hours”, without any problem (see Commercial Court, Uzinterimpex JSC v Standard Bank Plc., 15 May 2007, http://www.nadr.co.uk/articles/published/ArbitRe/Uzinterimpex%20Standard%20Bank %202007pdf).

100 Uzbek pledge laws recognize public warehousing, field warehousing and even tolling arrangements. And in case of default, it is relatively easy for the financier to take the goods and dispose of them. See Sidelnikov, 2006.
this form of financing is particularly suited to borrowers in higher-risk environments, which from a banking point of view applies to the vast majority of non-OECD countries. Furthermore, the agricultural sectors in these countries need efficient finance, and the purpose of structured finance is to enable credits to flow even in very challenging situations. A pragmatic solution may be to take a two-pronged approach. On the one hand, they should target the lowest-hanging fruits, that is commodities for which sound supply chains can be structured like those for export sales or for delivery to supermarkets, including through demonstration projects. On the other hand, they should remedy some of the institutional and regulatory weaknesses, including reducing direct government intervention while investing in market infrastructure.

The scope for more structured finance is probably least in the transition countries that have become EU members, where lending risks, both real and perceived, declined, and the need for tight financing structures reduced. Aspiring members are going through the same process. Therefore, by and large, in these countries there is currently limited need for structured finance, and even less need for international support in this domain. Banks in these countries are now, to a large extent, owned by western European and, to a lesser extent, American banks, and should not be prime targets for international support. Legal and regulatory conditions have much improved, including as part of the process to prepare these countries for EU accession. Major companies have built up track records, which now allow them access to balance sheet finance. There have been many western European investments, ranging from individual farmers migrating “east” to large acquisitions in the agricultural and agro-processing sectors in these countries. By and large, agriculture has become well organized. There is, however, still scope for improving local banks’ understanding of commodity finance and connected risks, as well as the practicalities of structured finance.

The large CIS economies of Kazakhstan, the Russian Federation and Ukraine have seen quite a few large structured finance deals, mostly on the back of major export flows. The legal and regulatory framework is favourable, though not yet perfect\textsuperscript{101}. As a result of the cooperation with western banks, several banks in the region have a reasonable experience with various forms of structured finance for agricultural commodities. In addition to providing WHR finance and discounting export receivables (i.e. post-shipment), they have participated in pre-export financings for grain, oilseed and cotton exports, using expected receivables from future exports as collateral. By the early 2000s, some of the banks had developed reasonable in-house capacity that allowed them to initiate their own transactions. With large farming enterprises as their clients, local banks have provided both hard currency and local currency loans to finance the production cycle, from ploughing to growing and harvesting. They have also commonly financed the working capital needs of grain millers, using WHRs and collateral management to secure their loans, putting their own agent on the premises of the miller, rather than outsourcing to a specialized agency. EBRD’s programmes to promote WHR finance and, to a lesser extent, its trade facilitation program (TFP), have been effective in promoting such forms of structured finance.

However, given that the very recent introduction of structured finance concepts, and the availability of large, attractive sectors (oil, metals and grains) have absorbed most of the country’s bankers that are knowledgeable in structured finance, fewer efforts have been made to target less traditional sectors. Targeted support could help change this. In particular, banks’ start-up costs of learning how to finance a “new” sector can be reduced through international support. A good starting point would be to focus on integrated commodity chains and non-traditional sectors. It should also be possible to extend existing financings, for example, to apply pre-export financing structures to benefit small farmers.

In the final category, the economies of Armenia, Georgia, Kyrgyzstan, Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan are small and vulnerable. They pose a sub-investment

\textsuperscript{101} For example, in the Russian Federation it can be difficult to enforce the assignment of future flows, i.e. of goods that are to be produced in the future (Winn et al., 2009); in Kazakhstan, such assignment is permitted. In many countries, easy out of court foreclosure, e.g. on WHRs, is not yet feasible. Moreover, in many countries there is a risk that courts will overturn commercial arbitration rulings.
grade risk to international lenders. The financial sector is underdeveloped, with few large local banks and virtually no international banks. Local interest rates are high. In Armenia, Kyrgyzstan, Republic of Moldova and Tajikistan, migrant remittances account for a large percentage of hard currency earnings and GDP, making these countries vulnerable to disruptions of these flows. A large number of migrants work in the Russian Federation, many of whom operate in the oil and gas sectors. Agricultural production is fragmented, with very few large farms. Governments have often retained strong control over agricultural sectors seen as strategic, and many rules and regulations, such as those on exports, hinder their proper development. The infrastructure for physical trade, including warehouses and grading laboratories, is deficient. The legal and regulatory regime is weak and corruption rife. Practices in commodity trade are unsatisfactory, with contract defaults a common occurrence. There is a lack of trust among the various players in the commodity sector. All of these factors complicate commodity finance. Structuring techniques can help mitigate the risks, but possible deal sizes are, in general, too small to be of much interest to international banks, while local banks do not have the required expertise.

102 For a discussion of the situation in two of these countries, see Hollinger, 2006.

Table 5
Country aspects affecting agricultural finance

<table>
<thead>
<tr>
<th>Country</th>
<th>Importance of agriculture</th>
<th>Fragmentation of agriculture</th>
<th>Yield risk</th>
<th>Weather risk</th>
<th>Development of finance &amp; insurance</th>
<th>Legal environment</th>
<th>S&amp;P Sovereign risk rating</th>
</tr>
</thead>
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<tr>
<td><strong>Group A</strong></td>
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<tr>
<td>Albania*</td>
<td>High</td>
<td>Highly fragmented</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Moderate</td>
<td>B+</td>
</tr>
<tr>
<td>Bulgaria*</td>
<td>Medium</td>
<td>Sharply dual</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High/Medium</td>
<td>Good/ Moderate</td>
<td>BBB</td>
</tr>
<tr>
<td>Croatia*</td>
<td>Medium</td>
<td>Highly fragmented</td>
<td>Low/Moderate</td>
<td>Moderate</td>
<td>High/Medium</td>
<td>Good/ Moderate</td>
<td>BBB-</td>
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<tr>
<td>Hungary</td>
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<td>Moderate</td>
<td>High/Medium</td>
<td>Moderate</td>
<td>-</td>
</tr>
<tr>
<td>Macedonia*</td>
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<td>Highly fragmented</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Moderate</td>
<td>BB</td>
</tr>
<tr>
<td>Romania*</td>
<td>Medium</td>
<td>Normal</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Moderate</td>
<td>BB+</td>
</tr>
<tr>
<td>Serbia*</td>
<td>High</td>
<td>Highly fragmented</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Moderate</td>
<td>BB</td>
</tr>
<tr>
<td>Turkey</td>
<td>High</td>
<td>Normal</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High/Medium</td>
<td>Moderate</td>
<td>BB</td>
</tr>
<tr>
<td><strong>Group B</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azerbaijan*</td>
<td>Medium</td>
<td>Highly fragmented</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Moderate</td>
<td>BB+</td>
</tr>
<tr>
<td>Belarus</td>
<td>Medium</td>
<td>Collectivized</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Bad</td>
<td>B</td>
</tr>
<tr>
<td>Kazakhstan*</td>
<td>Medium</td>
<td>Sharply dual</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Moderate</td>
<td>BBB</td>
</tr>
<tr>
<td>Russian Federation*</td>
<td>Medium</td>
<td>Sharply dual</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Moderate</td>
<td>BBB</td>
</tr>
<tr>
<td>Ukraine*</td>
<td>Medium</td>
<td>Sharply dual</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Moderate</td>
<td>B+</td>
</tr>
</tbody>
</table>
4.6 Linking commodity exchanges and agricultural finance

The existence of commodity exchanges helps banks expanding their agricultural financing activities. Transparent prices as generated on these exchanges mean that banks can more easily determine and monitor the value of collateral. Moreover, the possibility to deliver onto an exchange platform makes banks more comfortable with taking physical commodities as collateral. The percentage of the value of goods financed by a bank may be as much as 80–90 percent if the goods are exchange-traded, compared to 50–60 percent if they are not.

A bank can be proactive in assuring that the borrower hedges his exposure. Figure 9 illustrates a scheme used by the Agricultural Development Bank of China. The bank lends to an agri-corporate so that it can enter into prepaid forward contracts with farmers. These contracts oblige farmers to deliver into warehouses accredited by the Dalian Commodity Exchange. The agri-corporate has to hedge its price exposure through the exchange, using a bank-approved broker. The bank oversees the forward contracts as well as the hedge activity, receiving regular reports from the broker.

When the goods are delivered, the WHRs stay with the broker, ensuring that the bank will be reimbursed.

Exchanges also permit “cash and carry” operations, which allow investors to make a profit if their financing costs plus commodity storage costs are

---

### Table

<table>
<thead>
<tr>
<th>Country</th>
<th>Importance of agriculture</th>
<th>Fragmentation of agriculture</th>
<th>Yield risk</th>
<th>Weather risk</th>
<th>Development of finance &amp; insurance</th>
<th>Legal environment</th>
<th>S&amp;P Sovereign risk rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia*</td>
<td>High</td>
<td>Highly fragmented</td>
<td>Moderate</td>
<td>High</td>
<td>Medium/Low</td>
<td>Moderate</td>
<td>B to BB#</td>
</tr>
<tr>
<td>Georgia*</td>
<td>High</td>
<td>Highly fragmented</td>
<td>Moderate/High</td>
<td>Low</td>
<td>Medium/Low</td>
<td>Moderate</td>
<td>B+</td>
</tr>
<tr>
<td>Kyrgyzstan*</td>
<td>Very high</td>
<td>Normal</td>
<td>Moderate</td>
<td>High</td>
<td>Medium/Low</td>
<td>Moderate</td>
<td>-</td>
</tr>
<tr>
<td>Republic of Moldova*</td>
<td>High</td>
<td>Sharply dual</td>
<td>High</td>
<td>High</td>
<td>Medium/Low</td>
<td>Moderate</td>
<td>B+ to BB#+</td>
</tr>
<tr>
<td>Tajikistan*</td>
<td>High</td>
<td>Sharply dual</td>
<td>High</td>
<td>High</td>
<td>Medium/Low</td>
<td>Moderate</td>
<td>-</td>
</tr>
<tr>
<td>Turkmenistan*</td>
<td>High</td>
<td>Highly fragmented</td>
<td>High</td>
<td>High</td>
<td>Medium/Low</td>
<td>Moderate</td>
<td>CCC+ to B#</td>
</tr>
<tr>
<td>Uzbekistan*</td>
<td>High</td>
<td>Sharply dual</td>
<td>High</td>
<td>High</td>
<td>Medium/Low</td>
<td>Moderate</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Based on Odening et al., 2008; Annex 1 of this report explains the criteria through which the authors arrived at their assessments, based on detailed country tables in the same report. Sovereign risk ratings as per Standard & Poor’s, June 2011.

* Countries covered by the EBRD’s Trade Facilitation Programme.

# Predicted ratings for unrated countries, as per Dilip Ratha (World Bank), Euromoney Conference, Washington DC, 18 June 2009.
less than the difference between nearby and further out prices. The investor buys futures contracts which are near to expiry, and simultaneously sells futures contracts for a future month. He then takes delivery of physical goods on expiry of the nearby contracts, and keeps the goods in the exchange warehouse. In due time he delivers the goods against the further-out futures contracts. Globally, a significant portion of commodity stocks are financed in this manner, which considerably reduces the financing costs of storage for commodity producers, processors and users.

But there are ways to create a tighter link, with commodity exchanges intermediating directly between capital markets (not just banks) and commodity producers, processors and traders by offering innovative commodity-linked products. Globally, there are several successful examples of this arrangement, none of which have so far been used in transition economies. It is worth exploring the possibilities to introduce these instruments, as they do not require any particularly large investment in exchange infrastructure. They can be added to the product portfolio of existing exchanges, or, alternatively, traded on the same kind of platform that is now used for trading WHRs.

One example is presented by the agricultural repos that are structured by and offered on the Colombian commodity exchange. Section 4.6.1 below as well as Annex 15 describe these in some detail. Another example is the securitization of commodity projects to tap into the retail and institutional investment market through exchange listing. There is extensive free-floating capital in many of the countries of transition countries, much of it ending up in western markets, including in real estate. To a certain extent, this capital flight is linked to a desire to make the ownership of funds less transparent, but to an important degree, it is also the result of a lack of possibilities in the “home” countries for diversified investments, safe from legal and regulatory intervention. If one can create viable new investment vehicles, then these may well attract many investors. There are many possibilities in this domain.

For example, over the past two decades, it has been possible for individual investors in Australia to buy securities offering a return to the net revenue on a specific part of a farming, fisheries or forestry investment project (e.g. 0.1 ha of forest land). The commodity assets are controlled by specialized management companies, while their operations are regulated as managed investment funds. Shares in these schemes are traded on the stock exchange, making it easy for investors to close out their positions.

Under these schemes, an operator procures funds to invest in an operation from investors by selling them formalized rights to future production. For instance, in the case of fish ponds, these are the rights to a certain share of the fish in one pond; or, in the case of a timber plot, a share of the proceeds from the sale of timber produced on that plot and, eventually, the proceeds of the sale of carbon offset rights. The investment can be for a short period, such as three months for fish ponds. It can also extend to longer periods like the 20 years or more that is common in timber investments where the investor also has to wait several years before receiving any “dividends.” The operator, that may be a large company managing hundreds of fish and shrimp ponds, or tens of thousands of hectares of timber land, is paid out of the proceeds of the sale of the “securities” plus, typically, a share in the profit. Generally, he does not take a significant risk. Certain risks are laid off through insurance; others are borne by the investors who would often manage them through portfolio diversification. The structure may be further strengthened by medium-term marketing arrangements with large offtakers, such as supermarket chains or sawn wood or plywood mills.

Schemes have included ostrich, emu, crayfish and sheep farming, as well as flower and horticulture production. For example, in the livestock investment schemes, the investor buys animals

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103 Sales revenue minus costs, including management costs.
104 With less diversity, similar schemes have also operated in the United States of America for grains, in New Zealand and Chile for forestry and, in a more informal setting, in Indonesia for fish and shrimp farming.
105 Investors can manage these risks through portfolio diversification. For example, in Indonesia both individual investors and corporate treasuries invested in fish and shrimp ponds, as a high-return alternative to short-term money market placements. In order to reduce their exposure to individual ponds, where 100 percent of the fish or shrimps may succumb to disease, they generally invested in several ponds spread out over several lakes and other locations.
and pays regular fees to a manager to look after the stock and to sell them when appropriate. In the horticultural and forestry investment schemes, the investor leases land that is used to grow the crop. The manager is responsible for planting, maintaining, harvesting and selling the crop.

But most schemes have been in the forestry sector. Investors in these schemes can expect a return not just based on the value of the timber of tree products expected to be sold, but also, on carbon credits and other environmental payments such as biodiversity rights and salinity credits. Many of the companies in this sector issue securities that are traded on the country's stock exchange. All in all, commodity-linked issues like this offer a full range of investment opportunities, from short- to long-term.

4.6.1 Linking commodity and financial markets – the experience of the Mercantile Exchange of Colombia

An interesting example of how commodity exchanges can link the commodity and financial sectors is provided by the Mercantile Exchange of Colombia (BMC), which was set up by the country's government in 1979 as the National Agricultural Exchange. BMC provides spot and forward trading facilities; offers a procurement tool for "homogenous products" bought by a large number of government agencies, from the armed forces to municipal utilities; provides registry functions for agricultural sector contracts; enables exporters to buy subsidized currency options to protect themselves against the risks of local currency depreciation; and acts as a vehicle for the Ministry of Agriculture to provide subsidies or minimum prices. But its most interesting products have been focused on bringing finance to the commodity sector (see Annex 15 for a more complete description of BMC's experiences).

In particular, BMC has made a highly innovative use of repo contracts. In these contracts, those seeking finance sell their "assets," such as commodities in stock, or production capability leading to future revenues, with a commitment to their future repurchase. Among others, BMC has offered repo contracts on warehoused commodities, repos backed by the receivables from future commodity deliveries, and invoice discounting on commodity transactions. As individual notes and investment opportunities have deliberately been kept small (in the USD 1 000 - USD 7 500 range) they are widely traded by retail, corporate and institutional participants. In countries where there is a large spread between "prime" deposit rates and "prime" lending rates, these kind of contracts can be very attractive to investors and borrowers alike.

To give one example, a repo on a physical stock works as follows. The commodities are stored by a commodity producer, processor or trader under the control of a warehouse operator who has been accredited by the exchange. This storage can be in public warehouses or field warehouses temporarily put under the control of a collateral manager. The warehouse operator issues a certificate of deposit to the commodity owner. The owner transfers the certificate to an exchange broker asking him to sell it, while simultaneously signing a repo which commits him to buy it back at a given price after a specified period. The certificate is then ready to be auctioned on the exchange. After auctioning, there is a secondary market where the buyer can re-sell the certificate. Note that the physical certificate itself is held in custody by the exchange clearinghouse. At expiry, the owner pays the required sum, which is underwritten by his broker and also, in many cases, the clearinghouse, and receives back the certificate of deposit.

Repos on future receivables work in a similar fashion although here, the underlying security is a production process. The farmer sells forward the right to the revenues from the sale of poultry, pork or slaughter cattle, and, in return for the financing, agrees to act as an agent of the financier to fatten the animals for the required period.

By and large, repos have worked well in Colombia. But there have been a number of problems, particularly in situations where Colombian practices and regulations differed from international best practices. With respect to repos on physical stocks, for example, the exchange accepts certificates of deposits for goods that are not deposited yet, but that are merely on their way to the warehouse. It accepts as underlying
goods those that do not have liquid markets or that are highly perishable. With respect to repos on future receivables, the exchange did not keep the proper level of independent due diligence prior to and during the transactions, leading to the diversion of funds. Nevertheless, overall defaults have been in the high single digits, and the process improvements that would lead to reduction to acceptable levels can be readily imagined. More rigid structuring matching risk management tools and active monitoring of the transactions would have avoided most of the exchange’s problems and would have given producers the opportunity to raise funds directly on the capital market.

BMC’s ability to innovate exchange-traded contracts has been remarkable. In learning from its experience, one should try to add an impeccable implementation process. An important advantage of the Colombian repo products, as compared to, for example, Brazil’s CPRs, is that they do not rely on a complex institutional framework. The repos are transaction-based, and risks are largely dealt with within the exchange’s own rules, regulations and operational mechanisms. Building on BMC’s experience, even in a country with weak institutions, an exchange can create a “safe harbour” for financiers to invest in the both preharvest/production and post-harvest phases of agriculture.
Conclusion

A broad condition for enabling innovative agricultural finance and risk management is that agriculture – the supply chains that one wishes to target – is profitable from farm to fork, from producer to final buyer. If the farmer cannot cover his costs he is likely to default on his loan obligation and unlikely to invest in risk management. If a processor is not profitable, his equipment will not be properly maintained and he will have difficulty in supporting timely input supply to growers, risking that the flow of goods will be disrupted. If buyers can find better deals from other suppliers, there is a risk they will default on their purchase obligations or try to renegotiate them. And there are many more risks that go with unprofitable supply chains.

A wide range of innovative agricultural finance and risk management products and mechanisms is already in use in transition economies, and institutions supporting further implementation and development are being strengthened under ongoing development agency programmes. Governments and international agencies can broaden and deepen the approaches developed so far. Approaches that have demonstrated success in some transition countries and some sectors may be extended to other countries and sectors. In turn, it is possible to adapt successful models from other parts of the world. Possible actions can be divided into three areas: institution-building, developing instruments and legal and regulatory improvement.

There is vast scope for institution-building in transition countries, focusing on: organized trading platforms that can link agricultural trade, finance and risk management; “chain integrators” that enable goods to flow efficiently in agricultural value chains; and banks’ capability to originate and manage innovative agricultural financing transactions. The EBRD and other international financial institutions can support each institution-building mechanism in a distinct way.

Trading platforms, whether commodity exchanges or EWR systems, should be designed as vehicles for innovation. They can weaken existing inequitable or inefficient trading and financing structures and grant various groups initial access to innovative instruments. This innovative, game-changing potential should be the driver behind initiatives in this area. A trading platform that is unable to deliver disruptive innovation in its distribution modalities and/or the products that it offers is unlikely to overcome the resistance to change in transition countries’ agricultural sectors. In transition countries, such innovation is likely to be not just, or not even primarily, in price risk management, but also in finance including repos, products based on CPRs and bonds for commodity projects (see Annex 10), and counterparty risk management. Exchanges should also leverage available technology, including that for brokers, such as cloud computing solutions, in order to keep costs low and build large networks. There are different possibilities in different countries. Table 6 summarizes approaches that may be of particular interest to EBRD, but note that local ownership is critical for the success of an exchange project.
### Table 6
Suggested areas for EBRD attention in various countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Trading platforms</th>
<th>Structured finance</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albania</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>integration of exchange in pan-European network</td>
<td>support the capacity of local banks to develop value chain financing structures, centered around off-takers (e.g. supermarket chains) and contract farming arrangements: strengthen public warehousing system/laws and regulations.</td>
<td>forward contracts; regional delivery locations for futures contracts; exchange-traded weather index futures and options.</td>
</tr>
<tr>
<td>Croatia</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Estonia</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>FYR Macedonia</td>
<td>electronic auction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montenegro</td>
<td>electronic auction</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>integration of exchange in pan-European network</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Serbia</td>
<td>-</td>
<td>-</td>
<td></td>
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<tr>
<td>Slovakia</td>
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<td>-</td>
<td></td>
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<tr>
<td>Slovenia</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>regional exchange strategy; EWR system as anchor for exchange.</td>
<td>build finance around EWR system; work with banks to develop new pilots.</td>
<td>retail EWR products; securitization</td>
</tr>
<tr>
<td><strong>Group B</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>electronic auction; privatization of platform;</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Belarus</td>
<td>exchange development; EWR system</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>development; EWR system</td>
<td>training for banker; support to the emergence of collateral managers and credit support companies; through EWR system, build links with capital market.</td>
<td>forward contracts; new retail-oriented products on exchanges; local receivables-based financings; repos.</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>develop specific contracts; EWR system</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td>exchange development; EWR system</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Group C</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Armenia</td>
<td>regional approaches to develop commodity exchanges and EWR systems using a business process outsourcing model.</td>
<td>work with banks on specific value chains (e.g. cotton); support the emergence of collateral managers; introduce links with capital market e.g. use exchange to place repos and project bonds.</td>
<td>EWRs; value chain financings; project bonds.</td>
</tr>
<tr>
<td>Georgia</td>
<td></td>
<td></td>
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<tr>
<td>Kyrgyzstan</td>
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<td>Mongolia</td>
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<td>Republic of Moldova</td>
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<td>Tajikistan</td>
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<td>Turkmenistan</td>
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<tr>
<td>Uzbekistan</td>
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<tr>
<td>Source: Author</td>
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</tbody>
</table>

There is large scope for regional approaches when it comes to trading platforms. One possibility is the provision of a common technology. Business process outsourcing companies are a more specialized option that can provide and maintain the trading system for a range of countries. Linked through a leased line or the internet, this system can be used by a series of independent exchanges. This option not only has large cost benefits, but also enables each exchange to obtain improved access to the international trading community. Among other things, this system will make intraregional trading much easier. Another possibility is to build truly regional exchanges. Political support for such regional projects has so far not followed politicians’ rhetoric, but that might change.

Organizations like EBRD and IFC can expand their investment in “chain integrators” such as warehousing companies, collateral managers, marketing companies, special purpose vehicles (SPVs) that service specific sectors/companies (e.g. FMC) and the like. For example, in order to make collateral management services more accessible to a larger group of players, international financing institutions as well as local banks could invest in such companies, tying up
with an experienced collateral manager for the necessary technical skills.

The promotion of local FMCs merits more attention. FMCs are now active in transition economies, but they mostly belong to western groups. As special purpose vehicles FMCs are set up with the explicit purpose of managing investment or financing; therefore, they appoint professional managers. They ensure proper support to the actors in the supply chain, the marketing of the products, the adherence to the conditions of the loan, and take out the relevant insurances. Government agencies and donors traditionally have looked at strengthening farmer cooperatives as the vehicle for financing, but as experience has shown, there are many factors that hinder such efforts. FMCs can be a good alternative, and they do not necessarily undermine long-term policy objectives to empower farmers: a FMC can be set up with professional management, but structured in such a way that control is gradually transferred to farmers.106

EBRD, like IFC, now depends primarily on the ability of local banks to originate deals that can then be partially refinanced. Across the board, more could be done to strengthen local banks' understanding of the commodity sector and of structured finance tools, and even of simple tools like factoring and leasing. A good starting point would be to do “value chain audits”, which identify support entities that can form constriction points in the chain (e.g. commodities are likely to pass through these entities) and which, when properly organized, can form the anchor for structured financing. These audits can be followed by the development of blueprints for financing different sectors, and intensive training so that bankers are able to interpret and adapt these blueprints. In countries where banks have a sophisticated understanding of financial tools, as in Turkey, it is possible to work on the securitization of agricultural assets and future receivables.

While structured finance techniques are used in the region, their application is, from time to time, a bit loose. In effect, structured finance provides a high level of security to banks because of its rigid control and monitoring structure, among other things. Overly loose procedures negate much of the benefits of structuring tools. For example, banks monitor the flow of goods and of receivables when they finance an agricultural processor, and they consolidate these records with physical stock data. However, it is rather common in transition countries that banks only perform this consolidation every two weeks. They also have no systems to make proper use of monitoring data, such as detecting anomalies which should give rise to further investigation.

Structured finance is not fully safe, but the ability to detect any problems in a deal at a very early stage should strongly limit the size of losses.

Or another example: in structured finance, the bank converts credit risk (will the borrower reimburse?) into performance risk (will the borrower continue in his business?). A key tool for doing so is to ensure that the buyer of the borrower pays into an account controlled by the bank; the borrower will only receive what is left after debt service. In some of the deals in transition countries, a reasonable structure is put in place, but the borrower is then allowed to directly receive the payment for his goods from an offtaker, and is supposed to reimburse the bank out of this revenue.

It is thus clear that more intensive training on innovative agricultural finance would be useful. This training does not need to be limited to commercial banks, but can include microfinance banks and investment banking outfits, as well. In areas, like Central Asia, with more difficult conditions such training may most productively be organized around the actual structuring of financing transactions for a particular value chain.

Innovation in instruments depends, in part, on institutional innovation. Trading platforms are vehicles for innovative instruments. With an EWR system, capital market investors can directly invest in stocks of physical commodities. Repo finance becomes possible. On exchanges, project bonds for agricultural projects such as those set up by FMCs can be listed. A weather index derivatives contract

106 As an illustration of how control of a bank-financed SPVs can be shifted gradually from the bank through its appointed professional managers to farmers, one may consider what in the Philippines is aptly known as the “corporative model”. A common structure is that the bank enters into a joint venture with a farmers’ group, for example, to set up a processing plant, with the bank holding the majority stake. The bank appoints professional management. Over time, the farmers deliver raw materials to the joint venture, and part of the proceeds are used to buy back the bank’s stake until the farmers are full owners (see Rutten, 2004).
can be introduced, facilitating the growth of the weather risk management market. Nevertheless, designing appropriate instruments can be complex, and the end result does not necessarily entail the benefit of copyright protection. The successful innovator can be easily copied. Hence, there is a good argument for public support of the development of new instruments. Governments and the international community should also support demonstration projects. They should stimulate, through various means, research into these issues and the exchange of experience between practitioners and government policy makers.

Instruments that merit special attention include the following; and except for index insurance, all of these have the best chance for success if they are traded on or supported by an organized trading platform such as a commodity exchange:

• Index insurance, in particular, for weather risk: where there is a clear link between weather risk and economic losses, such instruments can be useful. But developing instruments and then arranging their distribution requires sophisticated skills and it is expensive. While in principle, index insurance is likely to be useful in many transition countries, donor agencies should make a pragmatic choice as to which countries they wish to support. This decision should be determined by the likely benefits for the national economy as well as the readiness of the local financial sector and the government to embrace these instruments.

• Repo contracts, as traded on the Colombian agricultural futures market: this instrument requires not only a trading platform, but also an appropriate legal and taxation framework, which will limit the number of countries where these instruments can be promoted.

• Capital market instruments such as Brazil’s CPRs; as argued in Annex 10, these particular instruments depend on an intricate supporting framework, and one should not assume that one instrument can be replicated in isolation. But international support can help determine which supporting elements are necessary for its success, and can then help in putting these elements in place. In Brazil, CPRs have largely been used by medium-sized and large farms because there is still too large a counterparty risk in the instrument. Small farmers have not readily been accepted as issuers of CPRs. This fact suggests that, at least in the short- and medium-term, experimentation with these instruments should focus on countries with fairly large farms.

• Project bonds, as traded in Australia, which can permit new, professional managers to become engaged in agriculture; as long as there is an organized trading platform, these instruments can add value throughout the region. International support can come in the form of product design and, perhaps, participation in the capital of the FMCs that are most likely to issue such bonds, at least in the commodity sector. There are also good opportunities for project bonds in the energy and infrastructure sectors.

Governments need to create a policy, legal and regulatory framework that enables efficient use of modern financial instruments. For commodity exchanges, this kind of framework includes the absence of negative actions such as unpredictable interventions in markets, and the provision of a supportive framework in terms of grading and quality control, contract enforcement, taxation, etc. If governments want to improve finance along the supply chain, they have to take into account the legal environment with respect to ownership rights, enforceability of contracts, bankruptcy and the transferability of WHRs, contracts and export licenses. While this work area should not be the main thrust of their programmes, donor agencies should support governments’ efforts. If governments are not making any efforts, then donors’ full focus should be on making specific transaction structures possible, both because certain groups will benefit from this and are thus likely to support it, and because as a result of the transaction support, the readily identifiable benefits will help overcome government reticence to the support of modern financial instruments. In addition, given the mistrust of markets that still prevails among certain policy-makers, an advocacy role of the international community remains useful.

107 For a general description of the most appropriate policy environment, see FAO/GTZ, 1998; and for a detailed checklist of supportive legal and regulatory conditions, see Budd, 1995.
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Annex 1: Variability of production of major crops in transition economies

Table 7
Variability of wheat production

<table>
<thead>
<tr>
<th>Country</th>
<th>Average production, 2005-2009 ('000 tonnes)</th>
<th>Lowest year as % of average</th>
<th>Highest year as % of average</th>
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<td>118%</td>
</tr>
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<td>130%</td>
</tr>
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<td>133%</td>
</tr>
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Source: FAO Statistical Database
Table 8
Variability of maize production

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<th>Average production, 2005-2009 ('000 tonnes)</th>
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Source: FAO Statistical Database

Table 9
Variability of cotton production

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Source: FAO Statistical Database

Table 10
Variability of sunflower seed production

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Source: FAO Statistical Database
Annex 2:
Producer prices for some major crops

### Table 11
Producer prices for cotton, maize, sunflower seed and wheat, 2000–2009 (USD/tonne)

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<tr>
<th>COTTON</th>
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<th>2005</th>
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<td>121.2</td>
<td>250.6</td>
<td>262</td>
<td>154.6</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>77.5</td>
<td>76.9</td>
<td>55.9</td>
<td>78.9</td>
<td>112.5</td>
<td>88.7</td>
<td>112.6</td>
<td>182</td>
<td>205.3</td>
<td>134.7</td>
</tr>
<tr>
<td>Slovakia</td>
<td>89.2</td>
<td>94.5</td>
<td>97.7</td>
<td>117.2</td>
<td>138</td>
<td>121</td>
<td>131.6</td>
<td>221.6</td>
<td>216.5</td>
<td>159.9</td>
</tr>
<tr>
<td>Turkey</td>
<td>159.5</td>
<td>126.9</td>
<td>164.3</td>
<td>222.4</td>
<td>252.8</td>
<td>268</td>
<td>249.3</td>
<td>323.6</td>
<td>438.7</td>
<td>328.4</td>
</tr>
<tr>
<td>Ukraine</td>
<td>89.5</td>
<td>71.9</td>
<td>58.2</td>
<td>119.1</td>
<td>92.7</td>
<td>81</td>
<td>104.4</td>
<td>157.8</td>
<td>143</td>
<td>101.7</td>
</tr>
</tbody>
</table>

Source: FAO Statistics, Pricestat
### Annex 3: Overview of commodity exchanges in transition economies

#### Table 12
Overview of selected commodity exchanges in transition countries

<table>
<thead>
<tr>
<th>A) Exchanges at a low level of development: Mostly operate as an open outcry auction platform with some standardization of trade. Mostly stagnant, with few or no plans to improve exchange operations.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name of exchange (in English/local language) and website address</strong></td>
</tr>
<tr>
<td>Yerevan Commodity and Raw Material Exchange (Yercomex) <a href="http://www.yercomex.am">http://www.yercomex.am</a></td>
</tr>
<tr>
<td>Rousse Commodity Exchange <a href="http://www.rsb.bg/">http://www.rsb.bg/</a></td>
</tr>
<tr>
<td>Skopje Commodity Exchange/Agro Berza Skopje <a href="http://www.agroberza.com.mk">http://www.agroberza.com.mk</a></td>
</tr>
<tr>
<td>Kazakh International Commodity Exchange (KICE)</td>
</tr>
<tr>
<td>Kyrgyzstan Commodity and Raw Materials Exchange</td>
</tr>
<tr>
<td>Universal Commodity Exchange of Moldova (UCEM) <a href="http://www.bursa.md">http://www.bursa.md</a></td>
</tr>
<tr>
<td>Novi Sad Commodity Exchange (Proberza) <a href="http://www.proberza.co.rs">http://www.proberza.co.rs</a></td>
</tr>
<tr>
<td>Bratislava Commodity Exchange (KBB) <a href="http://www.kbb.sk">http://www.kbb.sk</a></td>
</tr>
<tr>
<td>Tajik Universal Goods and Commodity Exchange (TUGE)</td>
</tr>
<tr>
<td>Commodity and Raw Materials Exchange (CRME)</td>
</tr>
<tr>
<td>Ukrainian Futures Exchange</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B) Exchanges at a medium level of development: Electronic trading platform, forward contracts, and moves/plans to improve exchange operations.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name of exchange (in English/local language) and website address</strong></td>
</tr>
<tr>
<td>Sofia Commodity Exchange <a href="http://www.sce-bg.com">http://www.sce-bg.com</a></td>
</tr>
</tbody>
</table>
Innovative agricultural finance and risk management

Georgia International Commodity Exchange (GICEx) http://www.vef.ge/exchange.htm
Georgia 2009 Earlier exchanges (the Caucasian Commodity Exchange and Tbilisi Universal Exchange) were created around 1991 but soon ceased operations.
Yes No

Poland 1995 An auction exchange, mainly for agricultural commodities (wheat, live hogs, etc.). Introduced, with some success, options on physicals. Tried unsuccessfully to introduce futures.
Yes Yes, but low volume

Belarusian Universal Commodity Exchange (BUCE) http://www.bubt.by
Belarus 2003 Established in December 2003 but only organized its first auction in 2005. An electronic trading facilitating exports and imports of commodities, with plans to introduce futures.
Yes (Timber, milk) No

Slovenia Power Exchange (SPE) http://www.borzen.si
Slovenia 2001 An electronic trading platform offering electricity spot and forward contracts.
No No

Commodity Exchange of Ljubljana/ Blagovna Borza v Ljubljana

Turkey 1993 Trade in precious metals spot and forward contracts.
No No

Polatli Grain Exchange http://www.polatliborsa.org.tr
Turkey 1984 A large spot exchange primarily for wheat.
Yes No

Adana Commodity Exchange http://www.adanatb.org.tr
Turkey 1913 A major cotton exchange with an open outcry trading floor.
Yes No

Konya Grain Exchange http://www.ktb.org.tr
Turkey 1912 Turkey’s largest physical grain exchange. Eight satellite exchanges in surrounding villages.
Yes No

Izmir Mercantile Exchange (IME) http://www.itb.org.tr
Turkey 1891 Turkey’s largest cotton exchange with primarily spot transactions on an open outcry floor.
Yes No

Kiev agroindustrial exchange “Kievagroprombirzha”
Ukraine 1991 The country’s largest physical commodity exchange, set up by trading companies and banks. Approved by the Ministry of Agrarian Policy for the introduction of derivative contracts.
Yes No

Ukrainian Interbank Currency Exchange (UICE)

Uzbek Commodity Exchange (UZEX) http://www.uzex.com
Uzbekistan 1992 Formerly Uzbekistan Republican Commodity Exchange. An electronic exchange, heavily controlled by the state. Serves as spot physical exchange, primarily for cotton but also for grains and fruits, and non-agricultural goods.
Yes No

C) Exchanges at a high level of development:
Sound technology level (electronic trading), a sophisticated range of instruments (including derivatives), integration in the international exchange world, a well-developed website and good trading volume.

<table>
<thead>
<tr>
<th>Name of exchange and website address</th>
<th>Country and starting year</th>
<th>Date of establishment and main features</th>
<th>Agricultural trade</th>
<th>Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polish Power Exchange “Towarowa Giełda Energii” <a href="http://www.polpx.pl">http://www.polpx.pl</a></td>
<td>Poland 1999</td>
<td>Trade in electricity day-ahead contracts, forwards and futures.</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Sibiu Monetary, Financial and Commodities Exchange (SIBEX) <a href="http://www.sibex.ro">http://www.sibex.ro</a></td>
<td>Romania 1997</td>
<td>Mostly trade in currency forwards and futures. Small volumes of agricultural commodities trade.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Romanian Commodities Exchange/ (RCCE/BRM) <a href="http://www.brm.ro">http://www.brm.ro</a></td>
<td>Romania 1992</td>
<td>Has both spot physical auctions and an electronic derivatives market trade in energy futures, financials and agricultural products.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Exchange Name</td>
<td>Country</td>
<td>Year</td>
<td>Description</td>
<td>Active Trade</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
<td>------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>St. Petersburg International Mercantile Exchange (SPIMEX)</td>
<td>Russia</td>
<td>2008</td>
<td>A major new exchange, which now trades physical crude oil and other energy items. Plans to introduce petrochemical futures, and derivatives on grains, timber and non-ferrous metals.</td>
<td>No, but planned</td>
</tr>
<tr>
<td>MICEX – RTS, 2011 merger of the Russian Federation Trading System (RTS) and Moscow Interbank Currency Exchange (MICEX)</td>
<td>Russia</td>
<td>1992</td>
<td>RTS was originally a stock exchange. Started trading in financial futures and options in 2001. In 2006, introduced futures on oil products and gold. Agricultural trade in grains and sugar accounted for a very small part of RTS volume. MICEX was a universal exchange, trade in currencies, debt instruments and single stock futures. It was set up NAMEX in 2004 for government grain procurement. NAMEX introduced wheat futures in April 2008.</td>
<td>Yes</td>
</tr>
<tr>
<td>Turkish Derivatives Exchange (TurkDex)</td>
<td>Turkey</td>
<td>2002</td>
<td>The biggest derivatives exchange in the country, located in Izmir. Trade in currencies, stock indices and government bonds. Cotton and wheat futures are listed but not actively traded.</td>
<td>No active trade</td>
</tr>
</tbody>
</table>

Source: Belozertsev et al., 2009.
Table 13
Status of WHR systems in selected transition economies

<table>
<thead>
<tr>
<th>Country</th>
<th>Overall level of WHR development(^1)</th>
<th>Proper legislation</th>
<th>Licensing and supervision</th>
<th>Performance guarantees</th>
<th>Future potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Good</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Good</td>
</tr>
<tr>
<td>Hungary</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Good</td>
</tr>
<tr>
<td>Slovakia</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Good</td>
</tr>
<tr>
<td>Republic of Moldova</td>
<td>Medium</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
</tr>
<tr>
<td>Lithuania</td>
<td>Medium</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Good</td>
</tr>
<tr>
<td>Poland</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Limited</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Low</td>
<td>Not final</td>
<td>No</td>
<td>No</td>
<td>High</td>
</tr>
<tr>
<td>Romania</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Limited</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Medium</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
</tr>
<tr>
<td>Turkey</td>
<td>Medium</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
</tr>
<tr>
<td>Croatia</td>
<td>Low</td>
<td>Draft</td>
<td>No</td>
<td>No</td>
<td>Medium</td>
</tr>
<tr>
<td>Serbia</td>
<td>Low</td>
<td>Draft</td>
<td>No</td>
<td>No</td>
<td>High</td>
</tr>
</tbody>
</table>

\(^1\) Höllinger et al., 2009.
There are many different ways to implement WHR finance. Which one provides the best way for the owner of commodities to obtain funding depends on the specific conditions of every case. Figure 10 shows three of the factors that need to be considered: how large is the need for depositors to get immediate access to their products; how good is the legal and regulatory environment; and how strong is the financial status of public warehouses. Processors who need immediate access to raw materials will find little of interest if a bank proposes to finance the raw materials in a public warehouse; instead, the bank should envisage creating a field warehouse on the processor’s premises (see below). Conversely, export trading is moving products through a “pipeline” from inland producer to international buyer. These goods need to be collected at a port warehouse, and as long as the port’s public warehouses are safe and professionally managed, it may well be convenient for an export trader to use them. On the other hand, if public warehouses are poorly regulated or capitalized, as is the case in many transition economies, the bank may feel more secure if it “wraps” the public warehouse by using an independent collateral manager.

Banks need to realize that in WHR finance, the specificities of the case are essential. Who owns the warehouse? Who manages it? In this respect, one should understand the differences between private, public and field warehouses. Banks have lost money when, in terms of active risk management tools, they treated private warehouses as public ones.

In a private warehouse, manufacturing and warehousing take place under the same roof, and are controlled by the same company. The primary business of the company controlling the warehouse is not warehousing, but manufacturing, wholesaling or retailing, and the warehouse is operated as part of its overall business. Therefore, there is a close relationship between the warehouse and the owner of the stored commodities. In certain countries, like the Philippines, these companies are allowed to issue WHRs as evidence of the presence of goods in their warehouses and banks accept these as collateral for loans. However, it is very risky to do this in private warehouses. Other than spot checks by the bank, there is little to ensure that the goods are really present, and even if they are, the bank has no control over their movement out of the warehouse. When the goods are present in the warehouse there is still a legal risk in the case of bankruptcy of the borrower because the bank will not be given priority over other creditors.

A public warehouse is normally a large storage area that serves many businesses; for example, in a port or major transit centre. It is owned or rented for a long period and operated by a warehouse operator, who stores commodities for third parties for a set fee. The warehouse operator does not obtain title to the commodities it stores; he does not own them, but acts as their custodian. Large independent warehousing companies both own and operate their own warehouses, but many public warehouses are operated under long-term contracts by independent operators. The owner gets a fixed rental fee; the operator earns...
warehousing and other charges. In order to obtain access to bank credit, a farmer or trader may move his/her goods into a public warehouse. Public warehouse operators often offer WHRs that banks accept as collateral, but whether this is sound collateral depends on many factors, particularly the legal and regulatory regime in the country, and the status of the warehouse operator.

A field warehouse is an arrangement in which a collateral management or credit support company takes over the warehouse of a depositor (i.e. producer/customer) or a public warehouse by leasing the storage facility, or part of it, for a nominal fee. The company becomes responsible for controlling the commodities to be used as collateral employing its own staff, controlling movements in and out, etc. In most cases, the warehouse belongs to the firm that wishes to obtain the credit, but control over the warehouse is relinquished to an independent operator. As the field warehouse is on or near the premises of the firm depositing the commodities, there is little disruption in the firm’s day-to-day business; in effect, instead of the goods being moved to the warehouse, the warehouse is moved to the goods. This form of WHR finance is particularly useful where the borrower needs ready access to the commodities, such as for processing operations. The credit support company issues WHRs that – as long as a number of conditions are met – are good collateral from a bank’s perspective.

Thus, banks may depend on different companies for their WHR finance transactions. These companies operate under different names: inspection agencies, warehousing companies, freight forwarders, collateral managers and credit support agencies. How do these differ from each other? In many respects, they offer the same services. For example, three of them normally offer inspection services, but they can be differentiated in terms of how broad a range of services they offer, and, in connection with this, how much risk mitigation they provide.

Warehousing companies may provide warehousing services to third parties. They are the public warehouses referred to above. There are some risks here in ascertaining what security the company provides against the risk that goods disappear, but with a good legal and regulatory framework, a WHR issued by a reputable warehousing company can be good collateral for any form of transaction. In such conditions, WHRs, or the corresponding silo receipts or tank receipts for bulk or liquid storage respectively, can be pledged or traded by both the commercial and the financial communities. However, in transition economies it is very doubtful that a sufficiently good legal and regulatory framework is already in place.

Many freight forwarders offer collateral management services as an extension of their logistics operations, often through their open cargo insurance policies. But a client is well advised to study the details of the forwarder’s insurance coverage. They can be compared to public warehouses in that collateral management will be in the forwarder’s own warehouse and will cease once the commodity leaves its premises.

Inspection agencies inspect the quality, quantity and/or weight of goods, often on demand from a financier. Letters of credit-based transactions generally require an inspection certificate, but such a certificate is established for one point in time, and the inspection company does not provide any guarantee or assume any liability for the continuing presence of the goods. Monitoring services involving repeated inspections to verify that the goods are still in place are generally provided over longer periods. However, these, too, give no guarantee on the continuing presence of the goods; the monitoring company merely certifies the presence of goods of the agreed quality. Inspection agencies are widely used by international banks financing exporters from transition countries, and all too often, banks’ credit committees treat these agencies’ services as if they were securing the presence of the goods.

Collateral managers offer a variety of services for ensuring the integrity of warehouses and the quality of commodities: quality inspection and grading, ensuring proper warehouse operations and storage, insurance against loss, damage or theft, etc. Collateral managers either own or lease warehouses, or they co-manage and supervise field and other warehouses owned by third parties. Their services cover the discharging of goods into the warehouse, their actual storage and their discharge from the warehouse.
Credit support agencies provide all of these services, and can also secure the goods as they move through a supply chain, including as they are being processed. A credit support agency identifies all the risks associated with a transaction, proposes mitigants for each risk for the financier, implements some of the mitigants and controls the entire transaction from when the bank releases funds to when the loan is repaid in full. Credit support is generally provided along the supply chain. For example, it can encompass a transaction cycle from an upcountry warehouse to the export warehouse, or from one country to another.

Different types of warehouses and support agencies present different risk profiles and risk structures. Which model is optimal depends on the specific conditions of a transaction. But financiers have to make a logical evaluation of risks and rewards, and not mistake the risks that go with any one structure or the risk mitigation offered by a particular service provider.
Annex 6: Characteristics of an EWR system

WHRs in their traditional physical form have many disadvantages. They can be lost or destroyed through fire, for instance. They can be tampered with or falsified. They require to be physically moved from place to place, and late arrival can lead to costly delays whether in transferring a loan or loading a cargo. They need to be kept for years by warehousing companies, commodity firms and banks to meet regulatory requirements. As long as they are recognized under the law, electronic systems avoid all these problems and, in addition, make it possible to unlock the full potential of WHRs as tools for trade and finance.

An EWR system is more than a registry. Electronic registries carry most of the costs of a full-fledged EWR system, but bring only a few of its benefits. A proper system provides an electronic platform for not just receipt issuance, but also for many forms of trade as well as for pledging and repo-finance. A dozen or so such systems are operated globally, including a number of proprietary systems of commodity exchanges. As an example, under South Africa’s Electronic Silo Certificates system, certified elevators/warehouses input information on commodity deposits into a dedicated interface and, through the Internet, the information is recorded in an electronic database. The database serves as a basis for exchange delivery systems, as well as for WHR finance as an interface with banks, trading of EWRs as an interface with traders and investors, and information supply to clients, government agencies, etc. All activities are internet-supported and hence, manageable through mobile phones.

Introducing an electronic system is not costly and gains are significant. The registry component on its own brings a significant level of protection against fraud by preventing the double use of WHRs to obtain finance from two different banks, the transfer of previously pledged receipts or attempts to take delivery with a fake receipt when the real receipt has already been sold or pledged. Suspicious discrepancies in movements into and out of the warehouse, or in the volumes pledged from one warehouse are also more easily identified.

Account holders can use the EWR system to administer their stocks including when moving stocks between warehouses, if they use more than one. Its trading functionalities permit it to find trading partners, for example, by issuing tenders. Banks and funds use it for financing against the security of pledged commodities. Financing can come within minutes of the commodities being deposited. The electronic nature of the receipts often makes for easy acceptance. A system should enable easy integration into a bank’s back office software, and permits the provision of credits even in places where the financier has no local representative.

Moreover, financiers appreciate the fact that there is a liquid secondary market. An exchange can use it as a convenient physical delivery platform, including managing the procedures for allocating specific receipts to specific buyers.

An EWR system can be considered as a “proto-exchange,” offering possibilities to invest and trade in existing commodities through a safe and easily acceptable electronic system. They may be a good first step, pending integration into a full-fledged regional exchange network for countries that are too small for a comprehensive commodity exchange, or where local investors are unable to pay the costs of such a system. If the spread in the capital market between

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108 To reduce the risk of counterfeiting, printed physical WHRs require all the security features of banknotes. They can thus be expensive. In Ukraine, the cost is USD 2 for a double WHR.

109 Such as Ukraine’s Central EWR Register, which uses software to keep track of the receipts which are still issued in paper form, and to perform various regulatory and control functions.

110 EWR systems all have extensive reporting menus, permitting users to generate historic and other customized reports, and providing facilities for exporting data to accounting software. They also provide strong internal control functionalities and detailed audit trails, which greatly facilitates risk management.
deposit rates and lending rates is more than a few percent, the investment opportunities offered through an internet-based EWR system can be very attractive for investors and owners of commodity stocks alike. Given that the commodities are actually already in existence, there is no risk of short-selling or “excessive speculation.”

Although a commodity exchange may take the lead in building electronic systems for its approved delivery warehouses, given the multiple potential uses, it is better if an EWR system can be managed by an industry association (as long as firewalls can be built to prevent leakage of confidential commercial information), a professional group (e.g. of notaries, initially financed by key stakeholders such as banks), a government department or a specialized company which is not otherwise engaged in commodity trade or finance.
Structured commodity finance demands much from the imagination of bankers in terms of their ability to structure the financing around the conditions of a company and the conditions of the country in which it operates. However, at the same time, structured financing is a very systematic process. The following are the steps for a banker to identify a financing opportunity and then design a sound financing structure:

1. Identify current or expected regular earnings or payment flows which are not yet used to generate low-cost finance. Such flows are relevant because they form the reason for the deal: with the appropriate structure, they can be leveraged to provide better credit terms in relation to amount, tenor and rates.

2. Identify which economic actors are involved in the generation and processing of these earning flows (i.e. create a first flow chart).

3. Decide whether it is possible to work with at least one of the major actors involved in these earning flows. This process will become the anchor of the transaction. Is the possible deal significant enough? Is the performance of at least one of the actors reliable?

4. If the demand for finance has not originated from the potential client, this is the time to enter into contact with the prospective new client and explain the benefits of your proposal. In the process, determine what the prospective client most needs. What are his main current bottlenecks? Is he challenged by inputs, machinery, electricity, services or perhaps the need for more working capital.

5. Then, design a structure for the financing. Which part of the product chain would be covered under the financing and what would the money be used for? How will the bank be reimbursed?

This process essentially means drawing up one or more financing flowcharts.

6. This step done, determine who would take care of securing the various flows in this flow chart, including the performance of the various actors. If goods are transported, how will this process be made secure. Are there proper collateral management agents? Who will check documentary requirements. Do you need a local partner bank? Who will check the borrower’s physical facilities? If insurance is needed, is this available, and at what terms?

7. Design specific risk-mitigating measures, which will make the transaction safe for the bank, for the various components of the financing structure. These measures can include controls over the spending of the loan, use and assignment of insurance, responsibilities given to outside agents such as inspection companies, hedging of price and/or currency risks and use of escrow accounts. In this seventh step, it also becomes possible to estimate how large the loan can be, how much overcollateralization is needed and what the terms would be.

8. At this stage the negotiations start. Is everyone willing to play the role that the bank envisaged? The original flow chart may have to be revised. The result will be a term sheet.

9. Due diligence needs to be done. If problems are found, go back to step six. If there are no problems, the deal can be closed.

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111 Adapted from Rutten, 2001.
Annex 8:
Pre-export finance in the Kazakh wheat sector

In September 2002, Kazakhstan became the first country in the former Soviet Union to obtain an investment-grade sovereign rating. The year before, the country had enacted a new grain law, which gave a firm legal standing to grain WHRs. The combination of these two factors made it possible for international banks to start extending major structured loans to Kazakh grain companies.

Both state-owned and private farmers/exporters benefitted from structured financing. The Food Contract Corporation (FCC), which is in charge of the strategic grain reserves and also exports grain for commercial purposes, launched a tender in August 2003 inviting banks to bid for the rights to arrange a structured loan. Winners were Kazkommertsbank, a local bank in which EBRD is a large shareholder, and SG CIB, the corporate investment and banking arm of the Société Générale Group. They put together a syndicated facility that provided a USD 85 million, ten-month loan.

Structuring elements comprised the use of local WHRs; the assignment of export contracts and other rights related to FCC’s grain exports; and the use of an offshore collection account to capture payments for the grain exports (see Figure 11).

Grain bought by FCC was stored in approved warehouses. WHRs were held and managed by Kazkommertsbank, which acted as the syndicate’s onshore security agent. The international buyers of the grain had to be approved by the banks, and they had to pay through letters of credit opened by international banks. Their payments were assigned to Kazkommertsbank’s correspondent banking account with SG CIB and kept until each repayment date. After each loan reimbursement, surplus funds were transferred to FCC. Export contracts were at fixed prices to mitigate price risk. Insurance and guarantees were put in place to secure the goods in the warehouses and to cover against some quantity-related risks.

After this first deal, FCC, which became a division of KazAgro, a national holding company to promote agricultural development, in December 2006, did a structured loan regularly, using the tender mechanism to get banks to bid against each other. In 2004, the structure was a pre-export finance like the previous year, but was even larger at USD 105 million and arranged by Credit Swiss First Boston. It had a two-year tenor, a lower interest rate than the 2003 loan and a one-year grace period before the principal and interest had to be paid. Structures remained similar until 2008, when ABN Amro arranged a borrowing base loan facility. This facility is more flexible as the funds made available are directly related to the value of the assets (e.g. commodities in stock or contract receivables) that are pledged.

In 2003, there was the first structured pre-export finance for a private grain producer,

Figure 11
Structured pre-export finance for Kazakhstan’s Food Contract Corporation, 2003

Source: Author
Ivolga Holding LLP, using WHRs to secure local grain stocks. This nine-month, USD 50 million transaction was followed less than a year later by a USD 70 million revolving 18-month deal. Both deals were structured by ABN Amro. The structure was like that of the FCC transaction in 2003, except that insurance was added to cover sovereign risk. As was the case for FCC, these deals were then regularly repeated. The latest finance, signed in January 2008, was for USD 300 million, and was a combination of pre-export finance and a borrowing base facility, but it ran into problems in 2010.

Several smaller grain exporters also benefited from pre-export financing from banks like Rabobank. The mechanisms are all similar: delivery of grain into an approved warehouse “unlocks” the financing. The bank will take a pledge, and use an international inspection agency to verify the presence of a grain. Before allowing the release of the grain from the warehouse the bank will take assignment of the export contract and ensure that export revenues are paid through an escrow account. Local banks have also taken the initiative. For example, in Kazakhstan, Kazkommertzbank has done a pre-export finance in cooperation with Dutch bank ING, for grain sales to the Russian Federation offtakers. Few structured financings are done with such non-OECD offtakers.

These transactions essentially functioned without much problem until 2010. Then, the absence of price risk management led to a default by the largest borrower, Ivolga, on over USD 100 million of loans from western banks. It also defaulted on even larger loans to the Russian Federation banks. Ivolga ran the world’s largest farm, essentially converting inputs such as fertilizer and diesel into wheat. It had the misfortune that it bought the inputs when oil prices were high. Fertilizer prices were also at their height in 2008 and its wheat was only harvested after the market collapsed at the end of the year. The problem could have been avoided had a hedging strategy been built into the financing. This example illustrates that for a financing structure to be sound, all major risks have to be identified and proactively managed.
Annex 9: Integrated value chain finance for the cotton sector in Côte d’Ivoire

Cotton is the major cash crop in the north of Côte d’Ivoire, providing direct and indirect income to some 3.5 million Ivoirians. Civil strife, which started in 2002, severely disrupted production, which declined from 400,000 tonnes to 150,000 tonnes in just two years.

Reviving the cotton sector became a crucial part of the programme of national reconstruction. A structured finance facility which enabled the supply of seeds and inputs to farmers as well as campaign finance to the ginneries was a core element of the cotton strategy. The facility, funded by the Islamic Development Bank, was structured as co-financed import of inputs, backed by proceeds of cotton exports.

The responsibility of organizing the on-site logistics was given to a state-owned cotton producer and ginner, the Compagnie Ivoirienne pour le Développement des Textiles (CIDT). It collaborated with the Bank and the Côte d’Ivoire branch of an international credit support agency, ACE Audit Control and Expertise (ACE-CI) to put into place a comprehensive risk management package. Seed and input supply were through CIDT as well as Yebe Wognon, an umbrella organization of cooperatives of cotton growers. Both these companies, which not only procured and processed cotton but also exported it, also benefited from campaign finance. Both entities would have been unable to obtain the necessary funds through regular balance sheet lending. Thus, they required deal structuring to move risk away from their balance sheet to the transaction itself.

If the value chain from inputs to final export sales functions well, the loan is self-liquidating. The bank provides hard currency finance, and is reimbursed through hard currency exports. The deal was structured in such a manner that, to the extent possible, the risks in this value chain were mitigated. From distribution of the inputs to procurement and processing of the seed cotton, and then transport and export of cotton bales, all risks were analysed and systematically mitigated.

All phases of the transaction were extensively planned and documented, with the financier along with the credit support company as his agent keeping a close watch on the actual use of funds and the cotton produced.

The groundwork for the deal was the calculation of the inputs required by the transaction beneficiaries, CIDT and Yebe Wognon. This groundwork was done from the bottom up, on the basis of individual farmers’ needs assessments.

Figure 12
Côte d’Ivoire cotton finance: setting up the transaction

Source: Author
The cooperatives contracted for the delivery of specific volumes with cotton ginneries. On the basis of these contracted volumes, it was possible to establish campaign plans in terms of the timing of input supply and cotton deliveries and input requirements per cooperative. All farmers who benefited from the scheme were individually captured in an electronic database created and managed by the credit support company, including data on their total land surface and surface allocated to cotton farming, their past cotton deliveries and other socio-economic data. This information made it possible to ensure a realistic plan for input allocations. Fertilizers used by the cotton sector benefit from a 50 percent government subsidy and tight control over distribution was necessary to avoid diversion.

The necessary inputs were pre-ordered from established suppliers and distributed according to the cotton crop agenda. Ginneries delivered inputs to the cooperatives, which had the responsibility for re-allocating products to farmers. Under the oversight of the CIDT Cotton Financing Coordination Unit, the credit support agent controlled, under a collateral management agreement, the stocks of inputs at the level of the gins and the cooperatives, and monitored the whole process of distribution and tallying of inputs. No cash actually went to cotton ginneries: all was paid directly to the input suppliers.

Harvesting typically begins in late November and ends in March of the following year. Individual farmers were expected to reimburse the value of the inputs distributed to them upon sale and delivery of the harvested seed cotton to the ginneries.

**Figure 13**
**Côte d’Ivoire cotton finance: securing input distribution**

**Source:** Author

**Figure 14**
**Côte d’Ivoire cotton finance: the reimbursement process**

**Source:** Author
Upon harvest, farmers deliver their seed cotton to their cooperative and receive a ticket acknowledging delivery. The ticket is matched with the earlier input deliveries, enabling a correct deduction of input costs. The cooperatives deliver the seed cotton to the ginneries where it is stored into warehouses controlled by the credit support agent. The agent issues WHRs for the seed cotton in cotton fiber equivalent terms, based on each ginnery’s processing ratio.

The cotton is ginned throughout the season with the credit support agent releasing only enough seed cotton process for the ginning process and taking immediate possession of the bales of cotton fiber once produced. The agent then controls the process of transport from the ginery warehouses to port warehouses, including due diligence to determine which transport companies are reliable and should be allowed to transport the cotton. The cotton in the port warehouses is also under collateral control. In effect, the whole supply chain, from the seed cotton to the delivery into a vessel, is guaranteed by the credit support agent, which even checks the export contract, verifies whether export taxes have been paid and collects the shipping documents for remittance to the bank.112

112 The credit support agency charges on a “per tonne” basis with monthly minimum charges per warehouse, except for insurance costs which are a function of the value of the cotton.
Innovative agricultural finance and risk management

Up to the early 1990s, Brazil’s agricultural sector relied, to a large extent, on the government to obtain the finance necessary for its operations. The government-owned Banco do Brasil was a large financier and since 1965 all banks in the country were obliged to allocate 25 percent of their demand deposits to the agricultural sector, mostly to be loaned at a fixed, low interest rate. Any shortfall to this target had to be deposited with the Central Bank at zero interest rate. But as the state reduced its involvement in agricultural finance and marketing, the agricultural sector continued growing and it became necessary to develop new mechanisms.

In the early 1990s, the private sector developed prepaid forward contracts as a financing tool, but these carried high transaction costs and were difficult to enforce. The government strengthened the regulatory framework for such new financing mechanisms by introducing the cédula de produto rural (CPR) in 1994. CPRs are bonds that can only be issued by farmers and farmers’ associations, including cooperatives, in which they pledge an agreed amount of crops (including in semi-processed form, such as ethanol) or cattle in return for financing.

The concept has since been further elaborated, and now there are not only different forms of CPRs, but they also have become the underlying for a vibrant financial market through a whole range of instruments. Since its inception, many tens of billions of USD have been traded through these instruments and CPRs have become an important, albeit not predominant financing tool for mid-sized and large producers. The obligatory lending programme referred to above remains their principal means of finance. In June 2009, there were some 12 000 registered CPRs with an average size of real (R$) 150 000.113 It was estimated that the volume of unregistered CPRs was some 15 times higher. These numbers can be compared to a total number of farming households of 5.2 million. These numbers suggest that less than five percent of Brazilian farmers used CPRs. Coffee, soybeans and cattle have been the main commodities for which farmers used CPRs as pre-harvest financing, and there has also been strong activity in sugarcane, cotton and timber.

The basic forms of CPRs

In 1994, only one form of CPR was provided for: a physical CPR, in which the farmer or a farmers’ association commits to the delivery of a specific commodity at a specific location. Effectively, their sales price has been fixed. The warehouse or stock yard, in the case of cattle, is declared, a narrow delivery window is set, and grades and quality specifications are clear. Often, too, discounts and premiums for varying quality specifications are set in the CPR. Partial deliveries prior to the maturity date are possible and are to be noted on the back of the CPR with the agreement of the buyer. These bonds could be difficult for financial investors to use, as they ultimately had to find a physical market buyer to take delivery of the commodities. In 2001, the government introduced two new categories of CPRs to bring more financial sector players into the market: financial CPRs and CPRs indexed to the futures market or another price reference system.

Annex 10: Using agricultural bonds for pre- and post-harvest finance in Brazil

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113 Marzo, 2010. Exchange rates: 1 June 2009, R$ 1 = USD 0.502; 1 June 2010, R$ 1 = USD 0.549; 1 June 2011, R$ 1 = USD 0.628.
In a financial CPR, the farmer issues a bond with a size that is determined by his pre-harvest financing needs and by the expected value of his future production. The bond can be issued to a bank or other credit provider that has already promised to finance the farmer or it can be auctioned off to the highest bidder through the electronic network of the commodity exchange. In the case of an auction, the farmer would be required to receive an aval/guarantee from a reputable bank or cover from an insurance company on his CPR. The bond has to be secured through the pledge of agricultural commodities. Upon the expiration of the bond, the farmer pays off the bondholder. The final payment could be on the basis of floating interest rates or fixed interest rates; the latter has become the most popular.

Investors who by law were prohibited from holding contracts or bonds that could result in physical delivery (e.g. pension funds) flocked to financial CPRs. Also, financial CPRs were often used as a marketing tool by input or service providers. For example, a farmer may buy fertilizers on credit through the issuance of a CPR, or a warehousing company can entice farmers to store their goods by immediately arranging a loan against them. Since 2003, they have also been used by CONAB, the national food supply company, as one of its procurement tools in Brazil’s food security programme. Through financial CPRs, associations of small farmers contract with CONAB for delivery of a range of food products from vegetables to honey, which are distributed to local institutions.

After their introduction in 2001, financial CPRs rapidly became the most popular form; however, since 2005 their volumes have been declining. As of 31 December 2010, the notional value of outstanding financial CPRs was USD 700 million. To put this value into perspective, it is less than two percent of total bank credit to the rural sector, and can be compared with a total USD

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114 In practice, farmers generally issue consecutive bonds, to cover the cash flow requirements of each phase of their production campaign.

115 Chimelewiska and Souza, 2010.
3.6 billion of CPRs estimated to be outstanding in April 2010.116

In principle, index CPRs combine the best of both worlds: for investors, index CPRs do not give rise to any physical delivery, while the farmer has effectively managed his price risk. The investor has taken on this price risk, but in most cases, if he wishes he can manage this on the futures market. Nevertheless, these instruments have been used sparsely. Farmers possibly prefer to handle price risk management and finance separately.

A fourth form of CPR, called export CPRs, was created by the Banco do Brasil. Figure 16 illustrates how these function.

Export CPRs are physical CPRs that can only be issued by farmers or their associations for the purpose of exports. Terms are determined by the commercial terms of the export contract, including price, quality, delivery location and time, or Incoterms. The producer issues the export CPR, and Banco do Brasil guarantees it by aval. The buyer pays in advance by opening a letter of credit or the like, while Banco do Brasil provides a 50 percent pre-export finance to the producer. On payment, the buyer receives a non-negotiable copy of the Banco do Brasil export CPR, as well as an endorsable custody certificate. The buyer endorses the custody certificate to the international bank that prefinances him. At delivery time, the producer delivers as per contract, and after receiving proof of delivery through shipping documents and the like. The bank will pay the remaining part of the purchase sum. If there is a delivery failure, the buyer is protected, first, by the Banco do Brasil aval. Second, he is protected by the custody certificates that give him access to the underlying CPR issued by the producer to Banco do Brasil and, hence, to the physical commodities that were pledged under this original CPR. Given this strong recourse in case of default, avalized export CPRs have been readily acceptable collateral for international banks, so buyers have had no problems in obtaining finance for their payment obligations under these CPRs.

The legal and regulatory status of CPRs

CPRs have strong legal status under Brazilian law. They are not just forward contracts. The buyer buys the bond117, and the bond seller has

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117 In early court interpretations, the payment of an advance was considered essential for creating a valid CPR. In 2010, however, the Supreme Court decided that CPRs are valid even if no advance payment is made, reasoning that CPRs, by enhancing contractual certainty, create wealth even if no financing is involved.
to perform on his obligations. If he does not, the buyer has access to a fast and efficient arbitrage system, with no dependency on the generally slow courts. The seller is also explicitly barred from using force majeure or “Acts of God” as an excuse for defaulting on his obligations. This fact has not prevented farmers from trying to renegotiate in particular physical CPRs. For instance, when the market price at time of delivery exceeded that agreed on in the CPR they thought it fair to ask for a higher price, without taking into account whether the buyer had perhaps hedged himself against price risk. But if farmers pose such demands, CPR buyers are in a strong position to refuse them.118

CPR clauses provide for the possibility of collateral or guarantees. While this is not obligatory, it has become standard. Collateral can take the form of a pledge on the underlying crop, or on other floating assets, or a mortgage on real estate. Floating assets as well as the CPR itself have to be registered at the register of deeds office in the issuer’s locality, together with the registration number of the plot where the crop is planted or the cattle are to be raised.119 Real estate mortgages have to be registered at the nearest real estate registry. They are less frequently used as they are difficult to enforce. Guarantees can come in the form of bank avals/ guarantees (Banco do Brasil, the country’s largest bank, is the most active player in this domain), or insurance against default. However, insurance can be difficult and expensive to obtain.120 The buyer/financier often engages a monitoring agency to follow the pledged crop as it approaches and then enters the harvest phase.121

In order to be publicly negotiated (i.e. to be considered as financial assets), CPRs must be registered in the system of registration and financial settlement of assets, as managed by the Central Bank of Brazil. Currently, two registries are approved by the Central Bank: the Bolsa Brasileira de Mercadorias (BBM), which is part of the country’s futures exchange, Bolsa de Valores, Mercadorias & Futuros (BM&F), and CETIP (the Settlement and Custody Chamber). CETIP is by far the largest registry for rural bonds. Once issued, CPRs must be held in custody in one of the 50+ financial institutions authorized by the regulatory authority for capital markets to provide custody services for securities.

But in most cases, holders of CPRs do not wish to publicly negotiate them. Not to do so generally frees them from the requirement to provide additional collaterals other than the crop pledge on the CPR. It also saves them the costs of a bank aval or insurance cover, which is significant. A Banco do Brasil aval costs as much as 0.55 percent per month.122 Also, if the CPRs will not be publicly negotiated, they do not need to be registered with a Central Bank registry, thus saving most registration costs,123 other than those of the municipal registry of deeds. Such CPRs are used in particular to reinforce credit transactions between two known parties, e.g. large corporates (input providers, processors, traders) that have longstanding and good relations with certain

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118 This position is true, at least, in principle. In 2005, some farmers who defaulted on their obligations under physical CPRs argued in court that they had the right to sell their product at market prices, and the court sanctioned their contract defaults. But, in a later case in 2008, the court decided that a trader who had bought CPRs from a large soya producer had made a pre-payment, not a loan, and had the right to delivery of the pledged soya beans.

119 It remains a problem that the local register of deeds offices are not yet integrated into a nationwide electronic registry.

120 The provider of the aval or insurance does due diligence on the CPR-issuer and asks for negative pledge covenants (i.e. a commitment that the farmer will not pledge his assets to others, unless approved by the bank/insurance company), mortgages and pledges (i.e. on machinery). In case the seller of a CPR does not deliver on the terms as set out in the CPR, the provider of the aval or insurance takes on the seller’s obligations. After, it will either negotiate with the farmer for reimbursement during the next campaign as the CPR gives it legal rights over this next campaign, or will call on the mortgages/ pledges.

121 In an interesting twist, there is a special type of cover regulated by the superintendence of private insurance, known as “CPR insurance”: this is a monitoring service, allowing the creditor to follow the stages of the productive cycle of the crop/ cattle pledged under the CPR (Andima, 2009a).

122 Marzo, 2010.

123 The various registration costs reportedly add up to some 0.035 percent.
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farmers. As these bonds only are registered in municipal registries of deeds, there is a risk that the same production is pledged more than once. To mitigate this risk, BBM is creating a central registry for voluntary free registration of non-negotiable CPRs, as well as forward contracts, rural credit notes, rural promissory notes and the like. Banks may refinance such processors or traders, accepting these CPRs as collateral, but in the case of default it is not clear whether the banks have the legal right to directly enforce the CPRs.

Once CPRs are in a Central Bank-approved registry they can be used for many purposes. They can be traded on the commodity exchange; they can be used to meet delivery obligations on a futures position; they can be traded over-the-counter; they can be auctioned off through Banco do Brasil’s e-auctioning system; they can be used to meet margin requirements on BM&F; and they can be used as underlying for more complex financial transactions. Since July 2011, financial CPRs as well as certificates of agribusiness credit rights (CDCAs) and warrant agropecuário (WAs) can also be distributed to “qualified investors” through Brazil’s regulated markets.

Using CPRs in structured trade finance

Because of their strong legal status, CPRs can make the structuring of finance much easier. Figure 17 gives an example. At its root, this figure represents a standard structure. A financier pre-finances a farmer, in this case for cattle rearing: this is a working capital loan that can have a maturity of up to one year or longer for crops where the maximum maturity is a crop season. Before the financier disburses the funds, the farmer has to have a contract in place with a reputable buyer and assign the payment under the contract to the financier.

The farmer uses the funds for his cattle rearing operations. The animals pledged under the transactions are marked accordingly. An inspection company monitors funds to ensure that they are used to buy feed and that the animals are kept in good health, etc. Once the cattle are ready for sale, they are delivered to the buyer who pays into an escrow account that was previously appointed by the financier. The investor is

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124 In the past, there have been cases of fraudulent issue of such non-registered CPRs, the most prominent one an “ostrich farming enterprise” Avestruz Master, which sold CPRs supposedly backed by ostriches to over 49 000 investors, for a total of more than R$ 1 billion. This 2004-2005 scam (not even one out of each 15 ostriches sold really existed) appears to have been sufficiently well publicized to scare later investors away from such schemes.

125 Marzo, 2010. This system, called IAgro, is expected to go live by the end of 2011. While registration is free, parties consulting the database have to pay.

126 This option is relatively expensive: buyers pay an auction fee of 0.75 percent of the value of the CPRs (https://www.agronegocios-e.com.br/opr/quantoCusta.cdr).

127 The cattle have to be identified by numbered rings, with “SISBOV” numbers registered in the Ministry of Agriculture and the vaccination control services. All of the animals’ SISBOV numbers are specifically mentioned in the CPR.
reimbursed the bond’s face value plus the interest charges and the remainder is remitted to the farmer. The financier runs the risk that the value of the cattle has fallen during the life of the loan, but he will normally hedge against this risk by using futures contracts on Brazil’s exchange, BM&F.

The financier can be an investor or a bank; the increased competition is, from the perspective of the farmer, one of the benefits of the CPR’s bond status. For the financier, the benefit is that the bond is legally much stronger than a simple pledge, and enforcing his rights is relatively fast and easy.

Building on CPRs – the alphabet soup

Only farmers and their associations can issue CPRs. For others, the government introduced a series of new pre-harvest instruments in December 2004, inspired by its experiences in the real estate sector. Two post-harvest bonds were also introduced at that time. Table 14 gives an overview of the various agricultural bonds now available. As is the case for CPRs, these instruments have to be registered in one of the two permitted registries. They can also be transferred by endorsement since rights are enforceable through arbitration procedures and they have priority rights as the commodities mentioned in the bonds cannot be seized by third party creditors, even in the case of bankruptcy of the issuer.

Pre-harvest instruments building on CPRs

For the pre-harvest finance of agribusinesses (farmers, cooperatives, processors, traders, agricultural equipment and input providers) the certificates of agribusiness credit rights (CDCAs) were established. The main characteristics are as follows:

- Issuer commits itself to pay in cash, at the maturity date, the amount specified in the bond to the bond holder.
- CDCAs, like LCAs and CRAs, have to be collateralized with CPRs, commercial contracts, WHRs (CDAs and/or WAs) or another formal credit right (promissory notes, rural mortgage notes and the like).
- They can be issued for any kind of current or future agriculture-related receivables; for example, by a farmer who has receivables from an offtaker, an input provider or equipment supplier who has receivables from farmers, or an agricultural processor that has receivables from his buyers.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Name</th>
<th>Underlying collateral</th>
<th>Issuers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preharvest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPR</td>
<td>Cédula de produto rural</td>
<td>Crops, cattle, to be produced in future</td>
<td>Farmers, cooperatives</td>
</tr>
<tr>
<td>LCA</td>
<td>Letra de crédito do agronegócio</td>
<td>Loans backed by agribusiness credit rights</td>
<td>Banks</td>
</tr>
<tr>
<td>CDCA</td>
<td>Certificado de direitos creditórios do agronegócio</td>
<td>CPRs</td>
<td>Agribusinesses</td>
</tr>
<tr>
<td>CRA</td>
<td>Certificado de recebíveis do agronegócio</td>
<td>Receivables (linked to CPRs and CDCAs)</td>
<td>Securitization companies</td>
</tr>
<tr>
<td>EPA</td>
<td>Export prepayment agreement</td>
<td>Commodities (agri or non-agri)</td>
<td>Commodity producers</td>
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<tr>
<td>Post-harvest</td>
<td></td>
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<tr>
<td>CDA</td>
<td>Certificado do depósito agropecuário</td>
<td>Goods in warehouse</td>
<td>Warehouses</td>
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<tr>
<td>WA</td>
<td>Warrant agropecuário</td>
<td>Goods in warehouse</td>
<td>Warehouses</td>
</tr>
</tbody>
</table>

128 Agricultural finance in Brazil is replete with acronyms for particular instruments. Apart from the bonds discussed here, for example, financiers can discount rural promissory notes or Notas Promissoras Rurais (NPRs) and rural trade confirmation receipts or Duplicatas Rurais (DRs). They can lend against the guaranty of Cédulas de Crédito Rural (CCRs). Agribusinesses can issue commercial paper, which are then called agrinotes or Nota Comercial do Agronegócio (NCAs). When an exporter issues commercial paper, it is called Nota de Crédito à Exportação (NCE). One can also mention a series of instruments used in government agricultural credit programmes, such as the rural pledge note or Cédula Rural Pignoratória (CRPI), rural mortgage note or Cédula Rural Hipotecária (CHR), rural pledge and mortgage note or Cédula Rural Pignoratória e Hipotecária (CRPH), and rural credit note or Nota de Crédito Rural (NCR).
Innovative agricultural finance and risk management

Figure 18 gives an example of how CDCAs backed by CPRs can be used to finance a processor, in this case a sugar mill. The sugar mill prefinances the farmers using physical CPRs through which farmers commit their future sugar production. He signs an offtake agreement for the white (i.e. processed) sugar with a buyer. The mill then issues CDCAs, backed by the CPRs as well as the commercial contract with the buyer. Just like CPRs, the CDCAs contain a "collateral clause," and under this clause the mill pledges the product (both sugarcane and white sugar, in this case). He makes a fiduciary assignment of the CPRs and the commercial contract, and he may provide further collateral such as personal guarantees, promissory notes or a bank aval.

After funds have been disbursed to the farmers, the mill may use an inspection agency to monitor their performance and to determine the status of the sugarcane crop. As it is being readied for harvesting, are farmers doing what is necessary so that it can be delivered to the mills? Is the cane that is harvested fully delivered to the mill? It is also possible that the investor who buys the CDCAs employs the inspection agency not just to monitor the farmers, but also to monitor the performance of the mill. The investor may also use futures or options to manage his price risk. When the white sugar is delivered, the buyer pays into an escrow account from which the investor is reimbursed. Any remaining sums are remitted to the mill.

It is also possible to use an agribusiness securitization company, which is in the business of acquiring agribusiness receivables – that is to say, promissory payments of cash – and securitizing them through issuing and selling agribusiness receivables certificates (CRAs) into financial and capital markets. The main characteristics are as follows:

- A special purpose vehicle (the securitization company) issues CRAs to investors.
- The company pledges as collateral for the CRAs the same pledges it has received from the farmers/agribusiness companies (that is to say, the CPRs and/or CDCAs and collateral therein, as well as the rights under the sales contracts). In addition, they also normally include the hedging contracts over the products.
- The CRAs are generally over-collateralized (i.e. for USD 120 of receivables, USD 100 of CRAs are issued).
- The collateral used for any specific series of securities can be put under a fiduciary regime; that is to say, it can only be used for payment under this series and not for any other obligations of the securitization company.

LCAs can be issued only by financial institutions such as banks and agricultural credit cooperatives. They represent credit rights over CPRs, CDCAs, CDA/WAs (see below), and/or commercial contracts. In the most straightforward case, the farmer enters into a contract with a trader. Through one of the registries, he then issues financial CPRs for

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129 On the specifics of LCAs, see Silva and Marquez, 2005. Cooperatives play only a minor role.

Figure 18
Using CDCAs in a structured finance transaction

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Source: Junior, 2008
the pre-finance amount that he requires to the bank, simultaneously assigning the rights under the contract. The bank pays for the CPRs and refinances itself by issuing LCAs. When the goods are sold, the trader pays the bank, the bank reimburses the LCA buyers and remits the remainder of the funds to the farmer.

LCAs are by far the most popular of the financial instruments based on CPRs, with 49,074 LCAs with a total value of R$231 billion issued from 2005 to September 2010. In the same period, 7,235 CDA/WAs were issued and 2,858 CDCAs with a total value of R$6.9 billion. CRAs have not taken off. As of early 2010, only 19 agribusiness securitization companies had been created, together issuing notes with a total value of only R$53 million (around USD 30 million).

There is a further preproduction financing tool that is not restricted to the agricultural sector: the export prepayment agreement (EPA). Under an EPA, an investor makes a prepayment to an exporter for the future export of certain goods. The mechanism has been used for a wide range of agricultural commodities, including ethanol, soybeans, poultry, frozen vegetables, leather, paper, pulp and petroleum products. The investor may be a bank or, in the case of the large deals, a bank syndicate, an investment fund, an importer, or a SPV registered outside of Brazil. In the latter case, the SPV issues securities backed by the EPA. If it is a bank, then in parallel with the EPA, the exporter will sign a contract with an importer. The contract is then assigned to the bank, alongside other credit enhancements such as rights on underlying commodities (e.g. CPRs) or bank guarantees.

EPAs can be established for short periods of up to 360 days, in which case they do not require any Central Bank approval. If they are settled beyond 360 days, registration of the transaction in the information system of the Central Bank is obligatory. Longer-term deals have been signed with terms as long as ten years. They are typically very large (in the hundreds of millions of USD) and, in the case of the agri-sector, are used for the construction of agri-processing plants and/or infrastructure.

**CRAs – an example**

Agribusiness securitization companies can be more or less specialized, financing only a small number of predetermined farmers involved in one crop, or giving its managers flexibility to invest in a range of CPRs and CDCAs across a range of crops. An example of a “simple” structure is a USD 10.2 million CRA issue in September 2010 by a SPV called Ecoagro, which was Brazil’s first securitization of agricultural receivables dedicated to soyabean production.

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130 As these CDA/WAs are issued in terms of physical quantity, not value, no indication of total value is available.

131 Ministry of Agriculture, Livestock and Food Supply, 2010. CRAs have grown relatively fast since then, though. As of 12 August 2010, the total value of outstanding CRAs registered with CETIP was R$310 million, a twelve-fold increase over a year earlier (data retrieved from http://www.cetip.com.br). This result compares to a value of outstanding LCAs of R$15.1 billion (a growth of 37 percent as compared to a year earlier), and of CDCAs of R$1.5 billion (a 15 percent growth).

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**Figure 19**

The Ecoagro soyabean securitization

![Diagram](Source: Author, based on Standard & Poor’s, 2010.)
to soyabean producers. Figure 19 describes the structure.

To summarize the essential characteristics of this CRA issue:

- The underlying were financial CPRs issued by eight producers selected by Egoagro, following a due diligence process.
- These issued financial CPRs were each for between four and 17.3 percent of the total. The CPRs were collateralized by commitments on the future delivery of soyabeans adding up to 110 percent of the face value of the CPRs (using the CME November 2011 futures contract as reference) and further collateralized by the farmers’ real estate.
- Commercial contracts were in place for delivery to a large trader (ADM) and receivables under the contracts were assigned to Ecoagro’s custodian bank, Citibank.
- The local branch of a Swiss firm (Cotecna) acted as monitoring agent to ensure that the soyabean commitments under the contract were indeed delivered to the logistics agent, NPK.
- Senior, mezzanine and junior notes with an expected life of ten and a half months were issued. The senior notes comprised about one third of the issue and were rated by a local agency as well as by Standard & Poor’s, at a local currency rating of A+, noting that it assumed the eight producers to have a much lower CCC rating.

The proceeds from the sale of the CRAs, minus costs (about six percent) were remitted to the farmers, enabling them to finance their production campaign. The soyabean were harvested from February to April 2011, and ADM paid into the Citibank escrow account from May to 30 July 2011. The funds received in the escrow account were used to reimburse the investors, with a payment waterfall. First, the holders of the senior notes were paid, then the mezzanine bond holders, then the holders of the junior bonds. To deal with the eventuality of production shortfalls or price falls beyond the 10 percent of “overcollateralization”, the legal term of the transaction extended for nine months to permit the obligations to bondholders to be met through deliveries in 2012.

Post-harvest instruments

Brazil has had a reasonable legal framework for WHR for a long time. Its 1903 Decree on Public Warehouses (“Decreto 1.102 – Armazéns Gerais”) specified a double WHR system, with certificates of deposit confirming the warehouse’s receipt of the goods, and warrants as pledge instruments. Both documents were transferable through endorsement. However, each transfer attracted taxes, and as financial instruments the warrants were inferior to many other products available on the market. There was also a lack of properly managed, financially-secure independent warehousing companies. Thus, the legal framework was not enough to stimulate active use of WHR finance.

To address the constraints, Brazilian regulations on WHRs were modified in 2005, making them an integral part of the financial sector rather than just tools for physical trade. The innovations, as compared to the earlier system, were the following:

- Obligatory registration in an officially-approved (electronic) registry.
- Obligatory use of custodian institutions.
- Electronic transfer and trade.
- Exemption from the tax on financial operations, and application of VAT only after exercise/liquidation of the CDA/WA.
- Liquidation of the warrant through the custodian institution rather than with the warehouse.

As before, current regulations stipulate two instruments for post-harvest finance, CDAs and WAs. Both are issued by a warehouse operator on request of a depositor upon his deposit of agricultural commodities. Their main characteristics:

- The CDA represents a commitment to deliver agricultural products, including in semi-processed form.
- The WA represents the commitment to pay in cash and grants the right of pledge over the

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132 See Standard & Poor’s, 2010. In the eight months after, Ecoagro structured five more CRAs for a total amount of USD 165 million, for sugar, ethanol and bioenergy; the longest tenor was five years (Bloomberg, 20 April 2011).

133 Silva and Marques, 2006.
product described in the CDA.

- The WA and CDA are always issued together and carry the same number.
- The WA and CDA are valid up to one year, with possibility for extension.
- The CDA and WA both need to be registered, electronically, in an approved registry.
- Once registered, the CDA and WA can be traded separately.

The option to take delivery is in the hands of the holder of the CDA. If he also holds the WA, he can immediately take delivery, assuming the warehousing charges have been paid. He takes delivery by asking the bank that acts as the custodian to cancel the electronic registration and surrender the CDA and WA. If he does not hold the WA that corresponds to his CDA, then he must deposit the amount of the debt guaranteed by the WA (i.e., its face value) in cash to the custodian before he can claim the products from the warehouse.

The main criteria for the issuance of CDAs and WAs are as follows:

- Warehouses that issue CDAs and WAs must be accredited by the National Register of Warehousing Units.\(^{134}\)
- A warehouse is not permitted to issue CDAs/WAs for its owner, but cooperative warehouses are permitted to issue CDAs and WAs to their members.
- The warehouse needs to meet certain technical criteria with respect to its infrastructure. As many warehouses have difficulties meeting these norms, regulators have been flexible, with timelines regularly shifting forward. Warehouses now have to meet the norms by 2017.
- Other than the requirement to meet warehouse norms, there appear to be no restrictions in terms of financial strength, operational capabilities or relationship with the depositor.
- The warehouse operator needs to have insurance against a range of risks, including disasters and theft, in the case of public warehouses.
- In terms of prior claims, the depositor has to declare that the product belongs to him and is free of any liens. Also, at the time of deposit, he has to irrevocably grant power to the warehouse to transfer the goods represented by the CDA to the last endorsee (i.e., final holder) of the CDA.\(^{135}\)

With these instruments, a farmer who has issued a financial CPR but does not wish to sell his crop immediately after harvest to repay his debt, can roll his loan into a CDA/WA structure and, thus, obtain post-harvest finance. Figure 20 describes how CDAs/WAs can be used. An owner of commodities, which could be a farmer, trader or end-user, or, as in this example, a processor, deposits them in a warehouse. The warehouse operator issues both CDAs and WAs, and the processor sells CDCAs to a financier, with the CDAs/WAs and, optionally, a commercial contract with an ultimate buyer as collateral. When the processor decides to sell the commodities, the buyer pays the bank, receives the CDAs/WAs and then takes delivery from the warehouse.

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\(^{134}\) Administered by CONAB, the state-owned national food supply company. When the law establishing CDAs and WAs was passed in 2004, this National Register was not yet operational, and warehouses were permitted until 2009 to continue under Ministry of Agriculture regulations. On 1 January 2010, the CONAB accreditation system became operational.

\(^{135}\) Andima, 2009.

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**Figure 20**

*Use of CDAs/WAs in post-harvest finance*

Source: Based on Ministry of Agriculture, Livestock and Food Supply, 2010.
The secondary market

There is an active secondary market for CPRs and associated instruments. Figure 21 gives the simplest structure. An investor can endorse a CPR and sell it to a bank, and the bank will pay him the face value of the bond discounted at prevalent interest rates. The bank can warehouse the CPR, pledge it to another bank as part of a security package, or, after endorsement, sell/discount it to another bank. International banks are often the buyer in the second case.

CPRs and other instruments that are registered either in BBM or CETIP can be traded electronically through the trading network provided by these two organizations. Repo transactions (i.e. sale with the promise to buyback or buy with the promise of resale) are possible for financial CPRs as well as CDCAs, LRAs and CRAs. Repo transactions are not possible, though, for CPRs specifying physical settlement. Trade takes place bilaterally as long as one of the two parties is a financial institution and through CETIP's electronic trading network.

The secondary market for CPRs and related bonds is also strengthened by the presence of investors keen to package sets of such instruments. Agribusiness securitization companies have already been mentioned, but they are restricted to investing in CPRs and CDCAs. More important are the so-called Credit Rights Investment Funds or Fundo de Investimento em Direitos Creditórios (FIDCs). Figure 22 shows how these operate. FIDCs can be closed- or open-ended investment funds. They can invest in any asset class, but because of the significant potential of agriculture in Brazil, financial institutions and portfolio managers have structured FIDCs specifically for agribusiness instruments and receivables. In 2007, the first year that such dedicated FIDCs were operational, they accounted for some 15 percent of the USD 5 billion invested in FIDCs. By 2009, there were 26 such FIDCs, investing billions of R$.

FIDCs operate as follows:

- A fund manager finds companies that can cede credit rights, e.g. through CPRs, CDCAs or LCAs.
- Due diligence is done on these companies to check their ability to perform in the future.
- The credit rights are sent electronically to the fund's custodian who checks if they are eligible (e.g. no double pledges).
- If they are eligible, the FIDC buys them, with a subordinated tranche remaining with the originating company (i.e. the originator sells USD 120 of credit rights for USD 100. If at the end, only USD 105 is paid, the FIDC receives the full USD 100, and the originator loses USD 15).
- When a credit is due, the buyer pays into an escrow account managed by the FIDC custodian.
- In priority, and up to the value of the bonds, the sums received by the custodian are paid to the FIDC; the remainder is remitted to the originator.
- The FIDC redeems the bonds from its investors. If there is a shortfall, there is a payment waterfall, with first the senior debt being served, then mezzanine debt and the remainder, if any, to subordinated investors.

While the secondary market is active, there still is considerable room for growth. As individual CPRs have a strong credit risk component, they are not

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Figure 21
Refinancing CPRs

![Diagram of refinancing CPRs]

Source: Author

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137 Herscovici, 2008.
the easiest investment instruments for those not specialized in agricultural markets. If CPRs are “packaged” through an LCA or another instrument, the larger pool may provide for better diversified risk, but the investor still needs to be able to understand the particular risk profile of a specific CDCA/LRA/CRA offer in order to properly price it. The case in the next section illustrates the risks.

Union National Agro+ - not all agricultural bonds are equally safe

Selection of borrowers and decisions on portfolio allocation are of crucial importance for FIDCs. If the fund managers get this wrong, the payment waterfall structure implies senior debt holders may be partially protected, but others can see the value of their investment erode quickly. This fact can be illustrated by the case of Union National Agro+, a USD 300 million FIDC which was established in 2007 to invest in financial CPRs and CDCAs, but with the right to invest also in the other local currency agricultural bonds discussed above. Figure 23 shows how the fund was to operate.

The notes, with a face value of R$ 1 million each and an expected life of two to six years, were sold in November 2007. The global financial crisis struck a few months later. The result was that by August 2008, sugar and ethanol prices in Brazil had fallen by 50 percent and 40 percent, respectively. The fund had a heavy concentration in the sugar industry: this sector had received almost half of its investments. By the end of the year, more than three quarters of its sugar sector investments were in default. In March 2009, the fund had to decide to stop lending and to concentrate on recovery of outstanding dues. Senior debt was largely protected, but mezzanine debt was not.

In addition to the assignment of receivables, land and other assets had been given as collateral. However, there was no explicit strategy to manage price risk: the hedging policy was formulated in terms of managing the interest rate risks between the rates expressed in the CPRs and CDCAs on the one hand, and the interest rates on the notes issued by the FIDC on the other. With the collapse of main clients, these risk management measures were insufficient. Recovery of debts proved difficult, and even holders of senior debt were affected. By September 2010, as much as 58 percent of the debt owed to the fund was more than 180 days overdue. Senior debt, by that time, had been further downgraded to a BB rating.

Figure 22
Investment funds for agricultural finance

![Diagram of investment funds for agricultural finance](Source: Author)
The support system for a vibrant market in CPRs and related products

CPRs and the various other bond structures developed on their basis do not operate in a vacuum. Figure 24 gives an overview of the institutional supports on which the success of these instruments has been dependent.

A number of conditions have been essential for the success of CPRs and related instruments:

- A farming structure with enough large and mid-sized farms with a good integration into supply chains is needed. The vast majority of CPRs are issued by farmers to suppliers (i.e. input companies) or offtakers (i.e. processors or traders), not to banks or other financiers. These supply chain partners know the farmers, and have commercial incentives to supply them with finance. Doing so through CPRs rather than through prepaid forward contracts or input sales on credit offers benefits to both sides. At the same time, the farmers are large enough to issue CPRs of a size that the supply chain partners can package and refinance through the financial system.

- A supportive regulatory framework is required. In particular, two aspects are important:
  - priority over other claims, e.g. in the case of bankruptcy of the borrower (the assets pledged in the CPR are excluded from the bankruptcy proceedings); and
  - the provision of out-of-court dispute settlements, and the consequent rapid dispute resolution process.

These mechanisms have been tested and they work. For example, when the issuer of a financial CPR under which 32,918 animals had been pledged fell into bankruptcy, the injunction of the buyer of the CPRs was granted, and 15,000 animals were seized. When a sugar company defaulted on its

### Table 15
Impact of sugar sector defaults on Union National Agro+ FIDC notes

<table>
<thead>
<tr>
<th>Category</th>
<th>Initial amount (million R$)</th>
<th>November 2007 rating, Standard &amp; Poor’s</th>
<th>November 2009 rating, Standard &amp; Poor’s</th>
<th>Value of each note* on 23 October 2009 (million R$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior</td>
<td>239</td>
<td>AA</td>
<td>A</td>
<td>1.11</td>
</tr>
<tr>
<td>Mezzanine</td>
<td>266</td>
<td>B</td>
<td>CCC</td>
<td>0.53</td>
</tr>
<tr>
<td>Junior</td>
<td>127</td>
<td>Not rated</td>
<td>Not rated</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Based on Standard & Poor’s and Fitch rating reports.

* Face value of each note: R$ 1 million.
obligations under an EPA-backed by CDAs/WAs, the release of the product represented by the CDAs/WAs to the financier was granted. In the case of a sugar mill that had been declared bankrupt, an investment fund that had bought CDCAs guaranteed by CPRs, under which sugarcane was pledged, received a favourable order that the sugarcane belonged to the fund. The revenue from the cane’s processing and sale had to be deposited in an escrow account and stay out of the general bankruptcy proceedings, with priority to serving the obligations of the fund.\textsuperscript{140} The out-of-court settlement is, in principle, immediate: an obligation due under a promissory note has to be paid within 24 hours. When CPRs were introduced, courts already had about 25 years of experience with promissory notes, making the risk of legal re-interpretation very small.

- The availability of bank guarantees and, to a lesser extent, insurance to underwrite the performance risks of individual farmers, is needed. CPRs are not without risk. There can be adverse weather events, pests, diseases or other factors that negatively affect the harvest, or the cattle. The issuer may decide not to plant the crop that he committed to sell. If he plants it, he may divert the payment through an alternative channel. The farmer who issued the CPRs may die.\textsuperscript{141} For these reasons, CPRs are little used by small farmers – their CPRs are considered too risky by financiers who cannot afford to do any detailed due diligence. Third party guarantees or insurance removes much of this risk. But the problem is that they can be expensive – as much as six to 10 percent for guarantees.\textsuperscript{142}

- The existence of monitoring agencies are required and must be able to monitor whether CPR issuers are using the funds they received for the intended purposes, and that products are not diverted surreptitiously to buyers unknown to the financier.

- The registration of the CPRs as well as the underlying collateral are needed. CPRs have to be registered with the register of deeds office together with the registration number of the property where the crop was planted. This requirement has two advantages. First,\textsuperscript{143}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure24.png}
\caption{The institutional context of Brazil’s CPRs and related instruments}
\end{figure}

\textsuperscript{140} Ministry of Agriculture, Livestock and Food Supply, 2010.
\textsuperscript{141} Andima, 2009a.
\textsuperscript{142} Idem. An important reason for this cost is that under Basel provisioning rules for banks, such guarantees need to be 100 percent provisioned for, and, therefore, immobilize much bank capital.
it becomes possible to control how many CPRs are issued on the same property, and, by using the separate registry of the National Institute of Colonization and Land Reform, to check whether a farmer pledged too many CPRs given his land holdings. Second, the CPRs cannot be falsified or pledged twice.

- The creation of another registry structure just to enable negotiability of the instruments is needed. Use of this second registry structure is not mandatory, but it gives flexibility to issuers as well as buyers. Apart from its evident benefits in terms of risk management, the registry makes it possible to open up the whole of the Brazilian market for potential buyers of agricultural commodities. Some 400 traders are connected to the electronic system of the BBM, for example. The system, which is similar to what is described in Annex 6 on an EWR system, provides easy functionalities for buying and selling contracts, for offering contracts for tender, for custody arrangements etc., and it is accessible through the Internet.

- The integration of the products into the commodity exchange system is required. The exchange provides reliable reference prices, as well as a point of sale of last resort for an investor who has had to take delivery of physical commodities, as in the case of default by the seller of CPRs. Integrating CPR transactions with risk management transactions permits arbitrage and a flexible marketing strategy.

- The regulatory freedom of large institutional investors to buy the instruments is required. There are some restrictions as to the percentage of their total portfolio that pension funds and others can invest in agricultural markets, but these are not unduly harsh.

- The ability of the financial sector to use CPRs as building blocks for more complex instruments, which has contributed significantly to the market’s liquidity, is a requirement. It should be noted that bond structures of the nature described here are not unique to the agricultural sector. They are widely used throughout the whole of Brazil’s economy. For example, electricity firms obtain working capital by issuing bonds committing the revenue of future electricity sales, and real estate firms finance their projects by issuing bonds backed by the future sale of buildings. Banks, investors and advisory firms (e.g. lawyers), therefore, have a high level of familiarity with the instruments and their possible uses.

- The tax-exempt treatment provided by the government in terms of financial transaction taxes and income tax exclusion on revenue from trading CPRs is needed.

But there also have been structural weaknesses. Lack of training continues to be a problem. There is still a lack of awareness of the instruments both in the agricultural and the financial sectors. Many structures, when submitted to one of the registries, do not meet the criteria for acceptance. With respect to CDAs/WAs, it was only in January 2010 that the right to issue these instruments was restricted to certified warehouses, which has not helped the financial sector to develop trust.

In conclusion, Brazil certainly has a most interesting experience when it comes to financing agriculture, and it is well worth exploring the Brazilian case for inspiration for new possibilities in other countries. However, given how well-embedded the CPRs and associated bonds are in the wider institutional and financial framework of Brazil, one cannot expect that it is possible to copy just one element. If an instrument is to be successfully implemented, a sufficiently large part of its supporting environment needs to be replicated, in terms of laws and regulations, support institutions and a positive government approach in terms of taxation.

143 Oliveira et al., 2010.
144 The main problem here is complexity. The registries recognize 20 different credit rights, and each has its own format with respect to the information that needs to be entered into the system in order to create a tradeable title. If a piece of information is missing or does not exactly conform to the requirements of the system, the attempt to register fails.
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Innovative agricultural finance and risk management


Annex 11:
Index insurance for the Mongolian livestock sector

Two fifths of the Mongolian population make a living in livestock herding. The livestock sector accounts for more than a quarter of the country’s GDP. The sector is highly vulnerable to weather events. From 2000 to 2002, 11 million animals died due to harsh winters; and in 2009/2010, 9.7 million out of a total of 44 million died, amounting to USD 477 million of economic losses.\(^{145}\)

Not even the most experienced herders can protect themselves from extreme weather events. During the communist period, the country had a government-backed livestock insurance programme, but replicating this in a free market regime proved difficult. A traditional livestock insurance programme would be very expensive to handle given the vast open spaces of Mongolia. Weather-based insurance was a priori considered as an acceptable alternative to individual insurance because Mongolia has reasonable historical weather records. However, the link between weather data and livestock mortality proved difficult to establish. Therefore, it was decided to use another index, that of region-level animal mortality.

The principles of this index insurance that was first piloted in 2006 were as follows:

- Herders retain small losses that do not affect the viability of their business.
- Larger losses are transferred to the private insurance industry through a product originally called the base insurance product (BIP); in 2009/2010 this was renamed livestock risk insurance (LRI).
- The final layer of catastrophic losses is borne by the government, originally through the disaster response product (DRP), which was replaced in 2009/2010 by government catastrophic coverage (GCC).

The insurance is on the basis of livestock mortality in a herder’s locality. Mongolia had more than three decades of data on animal mortality for all regions and the four major species of animals – cattle, yak, horse, sheep, goat – which made it possible to price the insurance. Individual herders receive an insurance payout based on regional mortality, not individual losses, and, therefore, still have an incentive to safeguard their herd’s health.

The BIP/LRI is sold and serviced by insurance companies. It is supposed to be a profitable product for them. Herders select the percentage of the value of their herd by species that they would like to insure, and pay the actuarially correct insurance premium. Herders now typically insure 30 percent of their herd. The insurance pays out when a region’s animal mortality rates during the coverage period (January to May) exceed specified “trigger” percentages (depending on the region and the species, these percentages are in the range of seven to 10 percent). The maximum payment is when mortality rates reach a specified catastrophic level: 25 to 30 percent, depending on the region.

Beyond this point, the DRP/GCC comes into play. Figure 25 illustrates the overall structure for the distribution of risks. The DRP/GCC is financed and provided by the government. Herders who buy the BIP/LRI are automatically registered for the disaster facility on the same species at no additional cost. Up to 2009/2010, if they did not take the BIP, they could still register for the DRP by paying a contribution to the administrative cost of the disaster facility. But since 2009/2010, only herders with a LRI can benefit from the GCC.

\(^{145}\) Luxbacher and Goodland, 2011.
Livestock losses are correlated across Mongolia’s regions. To ensure that insurance companies are able to make payouts required under the LRI, the government provides a re-insurance facility through a livestock insurance indemnity pool (LIIP). The pool is re-established each year. The insurance companies pay a premium in advance for re-insurance, on the basis of their expected sales of LRIs into the pool’s reserve fund. Then, all the LRI premiums that they received, minus administrative costs, are put into the pool. At the end of each insurance cycle, payments to the herders, if any, are made from the “regular” part of the pool; they are made directly to farmers so that they are protected from eventual insurance company bankruptcy. If these funds are sufficient, then the surplus is distributed among the insurance companies, pro rata to their contributions. The reserve fund is carried over to the next year.

If the funds are insufficient, then first payments are made out of the reserve fund, and should this also prove insufficient, then the government has access to a contingent debt facility of the World Bank.

The insurance facility worked well over several seasons, including a number with high mortality rates. Furthermore, herders continued to buy the policies even when their incomes declined in 2008 and 2009 due to a fall of cashmere prices, indicating that they find it of use. Banks have responded by offering insured herders loans at decreased interest rates. But insurance is still only offered through insurance agents, not bundled with loans. Mahul et al. (2009) identify this as an area in which the scheme can be improved as bundling insurance with loans will help achieve a greater reach.

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**Figure 25**
The structure of livestock index insurance in Mongolia

Source: Based on Mahul and Skees, 2006; and Luxbacher and Goodland, 2011.
References


Mahul, O. Belete, N. & Goodland, A. 2009. *Index-based livestock insurance in Mongolia*. International Food Policy Research Institute (IFPRI), Focus 17, Brief 9, December.
Innovative agricultural finance and risk management

Annex 12:
Microfinance for the agricultural sector: lessons from BASIX, India

BASIX\(^{147}\) is a MFI. It calls itself a “livelihood promotion institution”, providing credit to more than a million poor households in India, and insurance to a million more. In 1996 it started providing microcredit to rural poor. Cumulatively, until March 2011, it distributed USD 650 million of credits. It is present in over 25,000 villages, or about three percent of India’s total, and almost half of its microcredit portfolio is in agricultural lending.

BASIX structured its operations to be profitable, aiming to “yield a competitive rate of return to its investors so as to be able to access mainstream capital and human resources on a continuous basis.”\(^{148}\)

It introduced the concept of joint liability group lending to India, with the members of a group guaranteeing the loans to each other. It was the first microfinance bank in India to receive a commercial bank loan, and the first to refinance part of its loan portfolio with a major bank – both within three years of its creation. It rapidly created a large network.

However, after five years of operation it commissioned an impact assessment, and its findings shocked BASIX management: “only 52 per cent of its customers, who had received at least three rounds of microcredit from BASIX, showed a significant increase in income (compared with a control group); 25 per cent reported no change in income level; and 23 per cent reported a decline in their income level.”\(^{149}\)

These findings inspired BASIX management to change their organization’s fundamental mode of operation, in which the mindset of its executives would need to shift from that of microfinance to that of livelihoods promotion. Elements of BASIX’s work programme that had earlier been seen as just a support function now were given equal weight to credit provision.\(^ {150}\) BASIX formally adopted a “Livelihood Triad” as the core of its strategy, with separate parts of the group dealing with the separate components of micro-credits, agricultural support and institutional development, including organizing farmers into cooperatives.

The micro-credit operations were expanded to include savings, insurance, money transfers for migrant workers and price risk management. BASIX’s agricultural and business development services included work on productivity enhancement, input supply and output sales, local value additions and diversification from farm to non-farm activity. The third component, institutional development services, incorporated training activities as well as institution building. In the first component, BASIX’s earnings consist of interest on loans and commissions on the sale of insurance. For the latter two components, beneficiaries pay an annual fee.

A detailed study of those who had experienced no increase or a decline in income found three principal reasons:
1. unmanaged risk;
2. low productivity; and
3. unfavorable terms in input and output market transactions.

This study convinced BASIX that it had to address these issues directly in order to have a better impact. Consequently, it developed service packages in all three areas.

Risk management

BASIX operates in regions with rainfed agriculture. Therefore, it was well-aware of weather-related risk and in 1999 had started...
research on the possibilities of insuring villagers against crop loss. In 2003, it started a weather index insurance pilot with ICICI Lombard (a major Indian insurance company) and World Bank support, with policies for two products sold to 230 farmers in seven villages, all covered by one weather station. The second year witnessed only a small growth, but afterward, the programme started growing rapidly, expanding its product coverage and the number of weather stations it covered. It also continuously improved its contract in response to the feedback of farmers.

Its insurance contract divides the cropping season into three stages: sowing, flowering and harvest. Each stage is separately insured, with payouts occurring for each millimetre that rains are below the relevant threshold value, up to a certain maximum. The policy also includes a payout in case of excess rainfall for a number of consecutive days that can seriously damage the crop during the harvest period. And if the crop fails during the sowing stage farmers receive a payout that can be used to replant it.151 Insurance is for multiples of INR 1 000 (approximately USD 22).

Figure 26 shows the growth of the programme up to 2010. In 2008, the government started permitting private insurance companies to take advantage of the same premium subsidy offered to the public sector in certain regions, which allowed BASIX to start offering a premium subsidy of 40 to 50 percent.

Figure 27 shows the premiums paid as well as the claim amount. The 2009/2010 experience clearly brings out the need for access to re-insurance for this kind of programme. BASIX benefitted from re-insurance from Swiss Re. Obtaining re-insurance was not easy; only two major re-insurers operate in the Indian market, largely due to regulatory constraints. Re-insurance rates can be high, and re-insurers are not interested in amounts of less than USD 1 million. And the time constraints of weather insurance, which tend to be written no more than 30 days before the start of the covered period, leave little time for placement with international re-insurers who require at least 10 days until the start of the cover period.152

While the programme has not been a failure and has reached a client level at which it is sustainable, it is by no means a major success: the total number of clients is less than half a percent of the total number of BASIX clients, and only around two percent of its agricultural borrowers. To have come so far, BASIX had to do many things right, including:

- awareness-raising about the insurance products and their limitations (allowing the programme to grow in the first three years even though most farmers received no payouts);
- the ability and willingness of its staff, including its field staff, to pilot new product concepts, which was reflective of BASIX’s general focus on innovation;

152 Hazell et al., 2010.

Figure 26
Number of clients and claims for the BASIX weather index insurance programme

Source: Joshi, 2010.
• the capacity to listen to clients, and willingness to channel customer feedback into product design, which led to continuous improvements in each product cycle.
• the development of an efficient policy distribution and claim servicing process.

Despite these positives, BASIX faced many constraints. The quality of weather data was poor. Awareness-raising is a slow process, especially as the product had to be explained to farmers who generally are not only illiterate, but also do not understand the concept of "millimetre". They sow when the soil is humid enough. In the beginning, there was a scarcity of usable weather stations. BASIX has since entered into an agreement with a private sector company which installs and manages automated weather stations. But the key constraint has probably been that the BASIX insurance programme is not linked to credit. Experience elsewhere indicates that this is a major constraining factor. BASIX is exploring the possibility of building weather index insurance into its microlending.153

In addition to acting as a broker for sales of weather index insurance to individual farmers, BASIX’s principal non-banking finance company, Bharatiya Samraddhi Finance, bought a portfolio insurance product in 2004/2005. Its aim was to cover part of its agricultural loan portfolio against weather risk, as a proxy to default risk, in three drought-prone districts where it otherwise would have stopped providing credits. Rainfall that year was good and there was no payout on the insurance.154 Weather risk insurance is only one of the many risk management products that BASIX offers. It also provides life insurance. Built into its credits, all borrowers are covered for 1.5 times their loan size, health insurance, livestock insurance, insurance for micro-enterprises, and they even have the option of micropensions. Basix has also experimented with price risk management on India’s exchanges; however, its pilot projects have found that farmers have a clear preference for options, which are not yet permitted under Indian regulations.

Productivity improvement155

BASIX has recognized that profitable farmers are least likely to default. Under Agricultural, Livestock and Enterprise Development (AGLED) services, BASIX currently provides services to farmers growing a range of crops and for the production of dairy and meat (sheep and goat). To operate AGLED services, BASIX has trained some 1 000 livelihood services providers (LSPs), similar to extension agents.

AGLED services included soil-testing, integrated pest management, field surveillance, linking farmers with the proper input markets, health checkups of animals, livestock vaccination, training on use of feed and fodder and better dairying practices. Farmers pay an annual fee of around USD 10 for AGLED’s services. In 2009, 154 Mahajan and Ramana, 2004.
155 Based on Mahajan and Vasumathi, 2010.

**Figure 27**

Premium paid and claim amounts for BASIX weather index insurance

Source: Joshi, 2010.
AGLED had around half a million clients, and generated a reasonable profit of USD 450 000.

**Improving bargaining power in input and output market transactions**

BASIX has promoted various contract farming schemes. Some were non-viable because the agro-industries that functioned as offtakers were unstable. Schemes worked, but only as long as the offtakers remained in business. But many schemes had a more sustainable record of success. In a scheme for potato farmers, yields almost tripled and prices doubled. A scheme for cotton growers took years to stabilize, in part, because of an “undeclared war in progress between pesticide dealers/commission agents and the new cotton producers’ [organizations]”. Ultimately, though, it had a major impact on farmers’ incomes.

The cotton project was particularly interesting as all the components of BASIX’s “Livelihood Triad” came into play. Figure 28 describes the elements of this project, after several years of work. When BASIX started exploring the cotton sector, it found that the sector suffered from many problems, including indiscriminate pesticide usage, borrowing in kind at highly unfavourable terms and low prices as compared to market prices, which, furthermore, were rather volatile. It chose a multi-pronged approach to these problems. Its entry point was the replacement of expensive pesticides by new integrated pest/nutrient management techniques, taught through its AGLED services. Through its institutional development services, it encouraged farmers to organize, both into joint liability groups that permitted its members to borrow, and into producer cooperatives that aggregated the cotton supply.

BASIX’s loans enabled farmers to buy inputs, of which much less was needed, in cash rather than on credit. As they were better organized, they were also able to buy in bulk. This approach eliminated the old system where they received inputs in kind from commission agents who not only overcharged for the inputs, but also underpaid for the cotton that farmers had to deliver to reimburse their input loan. The farmers became free to decide when and how to sell their cotton. By tying up with a commodity exchange that brought electronic tickerboards to the principal market yards in BASIX’s area of operations, farmers became better informed about real-time prices. The opening of a warehouse by a collateral management company created by the same exchange gave farmers an effective choice: if they did not want to sell their cotton to a ginnery, they could store it in the warehouse and obtain a relatively cheap bank loan against their cotton collateral. BASIX also helped bring new buyers to the area in order to reduce dependence on the local ginneries. And, in the second year of its cotton financing scheme, BASIX extended loans to the farmers to enable them to have their cotton toll-processed for a fee at a ginnery so that they could sell the resulting lint directly to a large cotton mill.

A project in the dairy sector with Reliance Fresh, a supermarket chain that is part of India’s largest industrial group, is another example of how to build a successful value chain.

Reliance decided to build its own dairy supply chain in order to meet the growing demand for high-quality, safe milk. The supply chain it designed has three tiers: village pooling points, where the farmers can bring their milk on a daily basis; bulk milk cooling centres, where the milk from various village pooling points is collected and cooled; and dairies, where the milk is processed, packaged and distributed to retailers.

In January 2008, Reliance signed on one of BASIX’s subsidiaries, KBS Bank, to be its partner in setting up the village pooling points and bulk cooling centres. BASIX already had a positive experience in the dairy sector, having revived milk-chilling centres through technical assistance and by lending money to farmers to buy milking animals. A combined Reliance/KBS Bank team surveyed villages, appointed local people to run the cooling points and centres, equipped them and trained them. Reliance provided the equipment. They helped farmers in each village to

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157 For the potato and cotton case studies see Amarnath, 2007. The following paragraphs are based on his article.
elect one representative who would receive and manage the milk payments.

For BASIX and KBS Bank, the cooperation with Reliance opened up new avenues for financing, particularly for buying buffaloes. Of the 2,000 farmers supplying milk to Reliance towards the end of 2009, 500 had become clients of KBS Bank. BASIX helped farmers in the 40 villages covered by the Reliance scheme to form groups, and KBS Bank then started providing these with group loans to buy new milking animals. BASIX AGLED services helped farmers to take care of the animals, with the 400 benefitting farmers paying annual fees. The animals are insured through BASIX. The fact that farmers sold their milk through an organized marketing system which paid premium prices for high-quality milk discouraged them from defaulting on their repayment obligations. Possible payment problems could be identified early because of the sophisticated information system put in place to monitor individual farmers’ milk deliveries. In addition, for every litre of milk collected, KBS Bank receives a commission. In all, the business was sufficiently attractive for KBS to offer loans at an interest rate three percent lower than what it charged for equivalent loans to other agricultural borrowers.159

BASIX has also experimented with WHR finance for its clients in the soyabean sector where, thanks to the activities of the country’s commodity exchanges, there is good price transparency. As they are no longer forced into distress sales, farmers are in an improved bargaining position with traders.

Positive externalities, reduced distribution costs

BASIX works through a network of 150 branches, each with five field executives under a team leader. Each field executive supervises five livelihood service advisers (LSAs), who each cover about 10 villages within a radius of six to eight kilometres, originating credit, selling insurance, selling AGLED services and collecting

159 Politically-inspired government practices, however, act as an impediment. The government regularly announces programmes at low interest rates; three to nine percent a year as compared to KBS Bank’s 18 percent rate, and while in practice farmers rarely ever get access to these subsidized loans, hearing about them discourages them from paying commercial rates. Furthermore, the government regularly announces loan amnesties, giving farmers the impression that there is no problem with defaulting on loans.
repayments. Extensive use is made of modern information and communication technology, including IT-kiosks at the village level and automated procedures for many operations. In parallel, under the AGLED programme, there are about a 1 000 LSPs (extension agents). Thus, it has a large network with large fixed costs that need to be covered through earnings on its operations.

BASIX has found its multidimensional approach to be very effective in this regard. The activities in each of the components of BASIX’s “Livelihood Triad” de-risk and reinforce performance of the other activities. In its own words, “poor people, in addition to microfinance, need a whole range of Agricultural/Business Development Services (input supply, training, technical assistance, market linkages). To offer these services in a cost-effective manner, it is not possible to work with poor households individually and they need to be organized into groups, informal associations and sometimes cooperatives or producer companies. The formation of such groups and making them function effectively, requires institutional development services. Hence the Livelihood Triad.”

BASIX has found that while the per unit cost of delivering financial services to the poor is high, packaging other services together with credit provision carries only a small additional cost. For its insurance brokerage activities, for example, it now reaches two million clients, at a cost with which it is difficult to compete, yet which also generates considerable profits for BASIX.

BASIX has also benefited from a self-critical, innovative set of corporate values. It encourages staff to seek customer feedback for continuous process and product development and welcomes experimentation with new ideas. In addition to the examples above, BASIX has tried to use electronic spot markets to create access to new, remote buyers; it has set up a farmer call centre to give immediate advice; it has aggregated and sold microcertified emission reductions through a group company; and it has studied the possibilities for using catastrophe bonds.

While BASIX has made a good effort to manage its risk exposure, it was unable to protect itself against one major risk: that of actions by government authorities in India. In 2010, the state Government of Andhra Pradesh, where BASIX was very active, intervened in the microfinance market, creating over USD 100 million of bad loans for BASIX. A large new capital injection in August 2011, however, enabled the institution to stay afloat.

Not all of BASIX’s experiments have been successful. It has tried giving loans through market brokers, but found that they passed on loans at overly high mark-ups and were prone to default on their loan obligations. It has tried to work with input providers, which was an effective way to distribute loans; however, when farmers defaulted in drought years, the input companies defaulted on their loans, and the legal process in India is too inefficient to enforce payment. And there are certain lending methods that are, in principle, suitable for MFIs that BASIX has not experimented with, such as leasing.

Nevertheless, the broad approach adopted by the company and its success in improving livelihoods by delivering an integrated range of services may well inspire other institutions active in this field.

162 Jindal, 2009. The sale of the certified emission reductions at the end of 2010, which had been generated by converting some 15 000 households from traditional water heaters to solar water heaters, brought in EUR 2.5 million (BASIX Corporate Announcement, 18 November 2010).
References


Annex 13:  
Relevance of current CME contracts to Black Sea wheat and sunflower exports

Figures 29 to 36 show the development of Ukrainian export prices of wheat and sunflower oil from Black Sea ports between 2005 and 2011, as compared to CME prices for wheat and soya bean oil. At first glance, it appears that the Black Sea prices reflect CME prices, with the prices expressed in USD showing a correlation of around 90 percent or higher. With such high price correlation, one could conclude that there is no need for separate futures contracts for Black Sea wheat and sunflower oil. Instead, it would be sufficient if exporters from the region, and those supplying to them, had access to the Chicago market; for example, by placing CME’s Globex trading terminals in the region. Currency risks could be managed separately on the currency forward market.

However, a closer look at the numbers indicates that the case for using CME futures contracts as a proxy for Black Sea prices is not that strong. Tables 1 and 2 break up the analysis for separate years. It can be noted that whereas CME and Black Sea prices follow the same broad trend, and, hence, show a high price correlation over a longer period, in the short run these prices often move independently. Moreover, there is no indication of price correlations becoming better over time.

### Table 16
Correlation of Ukraine wheat with CME wheat

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</tr>
</thead>
<tbody>
<tr>
<td>Ukrainian wheat price FOB/DAF Black Sea 3rd class 12% protein in USD/tonne</td>
<td>94.22</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>67.75</td>
<td>93.63</td>
<td>69.38</td>
</tr>
<tr>
<td>Ukrainian feed wheat price FOB Black Sea port in USD/tonne</td>
<td>80.33</td>
<td>-18.42</td>
<td>86.28</td>
<td>84.96</td>
<td>65.02</td>
<td>49.41</td>
<td>94.81</td>
<td>73.13</td>
</tr>
<tr>
<td>Ukrainian milling wheat domestic grade 3 in USD/tonne</td>
<td>89.64</td>
<td>-50.34</td>
<td>88.19</td>
<td>93.87</td>
<td>83.02</td>
<td>61.83</td>
<td>86.67</td>
<td>-22.40</td>
</tr>
<tr>
<td>Ukrainian milling wheat domestic grade 3 in UAH/tonne</td>
<td>78.02</td>
<td>-48.33</td>
<td>88.39</td>
<td>94.02</td>
<td>89.52</td>
<td>59.42</td>
<td>78.79</td>
<td>-21.16</td>
</tr>
</tbody>
</table>

Source: Bloomberg. Weekly data have been taken, due to lack of availability of daily Ukrainian data. The data quality is not very good, as continuity is lacking.

### Table 17
Correlation of Ukraine sunflower oil with CME soy oil

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Ukraine sunoil FOB Black Sea USD/tonne</td>
<td>92.47</td>
<td>28.10</td>
<td>87.43</td>
<td>93.30</td>
<td>91.45</td>
<td>67.82</td>
<td>95.03</td>
<td>22.96</td>
</tr>
<tr>
<td>Ukraine sunoil FOB Black Sea USD/tonne (daily)</td>
<td>94.71</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>93.17</td>
<td>88.37</td>
<td>94.96</td>
<td>35.52</td>
</tr>
<tr>
<td>Ukrainian domestic sunoil prices in USD/tonne</td>
<td>89.20</td>
<td>15.87</td>
<td>63.68</td>
<td>93.04</td>
<td>92.09</td>
<td>64.89</td>
<td>94.20</td>
<td>-27.13</td>
</tr>
<tr>
<td>Ukrainian domestic sunoil prices in UAH/tonne</td>
<td>90.57</td>
<td>4.42</td>
<td>63.89</td>
<td>93.03</td>
<td>88.22</td>
<td>62.30</td>
<td>94.27</td>
<td>-27.18</td>
</tr>
</tbody>
</table>

Source: Bloomberg. Except for the second price series, weekly data have been taken. The data quality is not very good, as continuity is lacking.
As can be seen, years with good correlation are interspersed with years with little correlation of prices. This result implies that producers or exporters in the Black Sea area who wish to manage their price risks cannot rely on existing CME contracts, at least not as long as governments in the region continue to intervene in exports.

**Figure 29**
Ukraine wheat FOB price and CME wheat price

![Graph showing correlation between Ukraine wheat FOB price and CME wheat price.](image)

**Figure 30**
Ukraine feed wheat export price and CME wheat price

![Graph showing correlation between Ukraine feed wheat export price and CME wheat price.](image)

*Source: Based on weekly prices, as reported by Bloomberg.*
Figure 31
Ukraine domestic milling wheat price (USD/tonne) and CME wheat

Source: Based on weekly prices, as reported by Bloomberg.

Figure 32
Ukraine domestic milling wheat price (UAH/tonne) and CME wheat

Source: Based on weekly prices, as reported by Bloomberg.

Figure 33
Ukraine sunflower oil export price (weekly) and CME soyoil

Source: Based on weekly prices, as reported by Bloomberg.
Innovative agricultural finance and risk management

Figure 34
Ukraine sunflower oil export price (daily) and CME soyoil

![Graph showing correlation: 95% between CME soyoil and Ukraine sunflower oil export price (daily)]

Source: Based on daily prices, as reported by Bloomberg.

Figure 35
Ukraine domestic sunflower oil price (USD/tonne) and CME soyoil

![Graph showing correlation: 89.2% between CME soyoil and Ukraine domestic sunflower oil price (USD/tonne)]

Source: Based on weekly prices, as reported by Bloomberg.

Figure 36
Ukraine domestic sunflower oil price (UAH/tonne) and CME soyoil

![Graph showing correlation: 90.6% between CME soyoil and Ukraine domestic sunflower oil price (UAH/tonne)]

Source: Based on weekly prices, as reported by Bloomberg.
Annex 14:
No lack of donor efforts when it comes to agricultural finance – the case of Armenia

Agriculture accounts for 22 percent of Armenia's GDP, and its smallholder farms account for 46 percent of the country's labor force. Apart from staple crops of wheat, barley and potatoes, Armenia has a significant production of fruit, especially grapes. Its principal agricultural export is distilled alcoholic beverages (mainly brandy). Over a quarter of the population lives below the poverty line and most of this segment of the population are farmers.

While the vast majority of Armenian banks refrain from financing agriculture due to the high perceived risk of the sector, donor agencies have been rather active in agricultural finance since the mid-1990s when there was a dire need for them created by the rapid privatization of the sector and the collapse of traditional financing systems. Table 18 gives an overview of the agricultural financing programmes of Armenia's banks and non-bank financial institutions in early 2009.

As can be noted, the only bank that had committed a significant share of its own ending portfolio to the agricultural sector was the ACBA-Credit Agricole Bank. Alone, it accounted for about 72 percent of the total commercial bank portfolio in agriculture as of 31 December 2008. ACBA (Agricultural Cooperative Bank of Armenia) was founded in 1996 in the framework of a EU project, with technical support from consultancy agencies associated with Credit Agricole and Rabobank. In 2006, Credit Agricole became ACBA's largest shareholder.

The other commercial banks active in the sector essentially managed donor funds; first, under a number of separate programmes and, since 2006, under a "Rural Finance Facility" programme started by IFAD and later supported by the World Bank and a number of bilateral donors, such as the United States of America's Millennium Challenge Corporation (MCC). In this programme, the relevant ministries, the donor agencies and eight participating commercial banks agree on a refinancing framework. When a bank approves a loan, it sends it to the programme's credit committee which decides whether it qualifies for refinancing. The banks carry all credit risks.

In the non-bank financial sector, one finds three agricultural leasing companies and a number of microfinance organizations. All of the leasing companies were created under donor programmes: one with the World Bank, and the two others with the United States Department of Agriculture (USDA). Of the MFIs, two are parts of large global microfinance groups, SEF and FINCA, and most others were set up by international organizations. Some of the latter were, from the beginning, set up as MFIs (e.g. programmes of Save the Children Fund US and Catholic Relief Services, which in 2000 merged to create KAMURJ). Others were spun off from broader programmes to meet regulatory requirements. In particular, in 2006, the Government of Armenia decided that foundations could no longer engage in the provision of credits and had to register as regulated credit organizations to continue their activities. OXFAM, among others, decided to arrange its credit activities into a separate entity, Nor Horizon; and USDA's Marketing Assistance Project first became the Center for Agribusiness and Rural Development (CARD) Foundation, and then CARD AgroCredit.
### Table 18

Agricultural loan programmes of banks and non-bank financial institutions in Armenia, early 2009

<table>
<thead>
<tr>
<th>Institution</th>
<th>Programme</th>
<th>Donor support</th>
<th>Maximum loan size (in USD equivalent) and tenor</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Banks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACBA-Credit Agricole Bank</td>
<td>Wide range of products</td>
<td>Set up under EU project</td>
<td>158 000 &lt; 7 years</td>
<td>12–28%</td>
</tr>
<tr>
<td>Various banks</td>
<td>Rural finance facility program</td>
<td>IFAD, World Bank, USA (MCC)</td>
<td>150 000 &lt; 7 years</td>
<td>10–16%</td>
</tr>
<tr>
<td><strong>Non-bank financial institutions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECLOF (Ecumenical Church Loan Fund)</td>
<td>Group-guaranteed loans</td>
<td>Part of international network</td>
<td>400 &lt; 18 months</td>
<td>12%</td>
</tr>
<tr>
<td>Nor Horizon LLC</td>
<td>Farmer loans</td>
<td>OXFAM</td>
<td>800 &lt; 3 years</td>
<td>24%</td>
</tr>
<tr>
<td>SEF International</td>
<td>Loans to registered agricultural associations</td>
<td>International MFI</td>
<td>35 000 &lt; 2 years</td>
<td>24%</td>
</tr>
<tr>
<td>ANIV</td>
<td>Loans to rural enterprises</td>
<td>IFAD, MCC</td>
<td>15 000 &lt; 3 years</td>
<td>18%</td>
</tr>
<tr>
<td>AREGAK</td>
<td>Loans to women groups, and enterprise loans</td>
<td>United Methodist Committee on Relief</td>
<td>Open &lt; 1 year</td>
<td>2% per month</td>
</tr>
<tr>
<td>FINCA</td>
<td>Group loans and farmer loans</td>
<td>International MFI</td>
<td>20 000 &lt; 18 months</td>
<td>22%</td>
</tr>
<tr>
<td>CARD AgroCredit</td>
<td>Group loans, loans to farmers and processors; leasing</td>
<td>USDA</td>
<td>120 000 &lt; 5 years</td>
<td>16–22%</td>
</tr>
<tr>
<td>Turpanjian Rural Development Programme</td>
<td>Farmer loans</td>
<td>American University of Armenia</td>
<td>15 000 &lt; 5 years</td>
<td>6%</td>
</tr>
<tr>
<td>KAMURJ</td>
<td>Group-guaranteed loans</td>
<td>USAID</td>
<td>1 500 &lt; 1 year</td>
<td>2.7% per month</td>
</tr>
<tr>
<td>Izmirilyan-Eurasia Universal Credit Organization</td>
<td>Enterprise loans</td>
<td>Set up by Swiss NGO. Bought by Araratbank in 2009.</td>
<td>125 000 &lt; 4 years</td>
<td>15%</td>
</tr>
<tr>
<td>Farm Credit Armenia</td>
<td>Farmer loans</td>
<td>USDA</td>
<td>15 000 &lt; 3 years</td>
<td>15–20%</td>
</tr>
<tr>
<td>ACBA Leasing</td>
<td>Agricultural equipment leases</td>
<td>ACBA Bank/ IFC/Credit Agricole/Lebanon Leasing Company</td>
<td>Open &lt; 5 years</td>
<td>11–14%</td>
</tr>
<tr>
<td>AgroLeasing LLC</td>
<td>Agricultural equipment leases</td>
<td>USDA</td>
<td>57 000 &lt; 7 years</td>
<td></td>
</tr>
</tbody>
</table>

**Sources:** Largely based on Urutyan et al., 2006, and Urutyan 2009.

The various donor-supported agricultural programmes have had a significant impact, both directly and indirectly. ACBA-Credit Agricole Bank, for example, had an outstanding credit portfolio of USD 253 million at year-end 2008.\(^\text{168}\) With 142 500 loans outstanding, its average loan is of USD 1 776 and has a two-year tenor.\(^\text{169}\) This number of loans can be compared to a total number of farmers in Armenia of around 338 000. IFAD’s rural finance facility has introduced seven banks that previously had not issued any loans to rural clients involved in agriculture. Most have since started to use their own funds to expend their operations and some have established a unit dedicated to rural loans.\(^\text{170}\)

The donor agencies have stimulated innovation. Agricultural leasing is one example. Another example is the creation of “credit clubs” under a USDA programme. This programme was originally designed for rural women, but was then made available to all rural people. Under this programme, USDA invested the initial capital for a credit club, expecting no return on its equity. However, it can decide to remove its equity at any time. Members make membership payments,

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\(^{168}\) It benefits from large international facilities, e.g. from EBRD and IFC.

\(^{169}\) ACBA-Credit Agricole Bank, 2009.

\(^{170}\) IFAD, 2008.
and can apply for credit using the Club’s funds as guarantee. This programme created several viable credit cooperatives. However, whether these credit cooperatives have any lasting value or were only a useful tool until banks improved their agricultural lending practices is an open question. A 2010 evaluation finds that “now that ACBA is offering investment and working capital credits from its own resources, the usefulness of credit cooperatives has all but disappeared.”

The operations of donors have also helped improve the legal and regulatory environment. Leasing is a good example. In the initial market survey, it was found that potential demand was large, but that appropriate laws had to be in place before investors could become interested. A draft law on leasing was circulating, but was not making much headway in the regulatory process. However, once donor projects started and a financial package of USD 5 million of equity, loans and technical assistance was lined up, Parliament quickly started paying attention and the law was rapidly passed: “The lesson to be learned here is enabling environment activities are stronger done in parallel to a technical activity.”

Still, a major part of agricultural credit demand remains unmet. Agricultural finance continues to be perceived by banks as risky and difficult, which is not unreasonable in the absence of a proper supporting framework. ACBA-Credit Agricole Bank noted that in 2008, while it accounted for 74 percent of the market by the agricultural loan portfolio, it accounted for only 16 percent of the market by the volume of profit, indicating that the market segment on which it focuses is relatively low-profit. The main constraints mentioned by farmers are the continuing perception of bankers that agriculture is risky, along with the high collateral requirements of most agricultural lending. Using a wider range of lending techniques may enhance agricultural credit penetration. The programme’s described approach depends on three techniques: individual counterparty risk assessment (with past performance and the ability to provide collateral as important risk mitigants); group lending; and equipment leasing. There is room for other techniques.

Among others, there are emerging value chains, with farmers supplying products under longer-term arrangements to processors and other buyers. Local supermarket chains have been expanding, for example, and are investing in their own logistics chains. In the dairy sector, much work has been done to create efficient farm-to-fork chains for milk, cheese and other products. With respect to grapes, around 90 percent of those produced in the country are processed; most by about 30 wine factories who export much of the resulting brandy. A few of the factories enter into forward contracts with farmers under which they make prepayments. It seems, however, that banks have not yet developed dedicated value chain financing products.

Furthermore, in the microfinance sector the approach seems fairly traditional, with a reliance on groups for assuring repayment, but little or no effort to identify and directly address the economic factors that are likely to cause repayment difficulties. Furthermore, modern technologies that help bring finance to smaller borrowers, such as smart cards and biometric identification, do not seem to have been introduced into Armenia yet. Much of the range of microfinance products used by Basix in India (see Annex 12) appears to be absent in Armenia. Microfinance institutions in Armenia might consider the scope for introducing concepts such as the mitigation of risk by incorporating insurance and market-based risk management approaches; extension services to secure the viability of farming; and organizational support for the creation of agricultural value chains.

171 Urutyan et al., 2006.
174 Urutyan, 2009, quotes a 2006 Central Bank survey in which it was assessed that only 17 percent of agricultural credit demand was satisfied.
175 ACBA-Credit Agricole Bank, 2009.
176 ACBA-Credit Agricole Bank, 2009, describes its main risk management mechanism as follows:

– the gradual increase in the amount and tenor of a borrower’s loans, depending on his credit history;
– a pragmatic risk analysis method: simple for small amounts, detailed and with strong documentary requirements for large amounts; and
– a visit to the farm by the loan experts, and thereafter regular (one to four times a year) control over the disbursed loans.
Finally, it can be noted that, with the exception of market information services,177 little attention seems to have been paid to the development of support entities for agricultural finance, such as electronic registries for land, other assets, mortgages, pledges and contracts; warehousing and cold storage facilities;178 collateral management agencies; or credit bureaus.

177 The Armenian Market Information Services project, funded by the United States of America government’s MCC, was started in December 2008. It provides market prices for fruits, vegetables and cut flowers, including through SMS messages.

178 An exception is a US-funded cold storage facility to act as a link between farmers and supermarkets and other food outlets, opened in December 2009. Facilities such as these can act as an anchor point for agricultural finance.
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Annex 15:
Linking commodity and financial markets – the experience of the Mercantile Exchange of Colombia

The BMC was created by the country’s government in 1979 as the National Agricultural Exchange (BNA) to offer a platform for the trade in agricultural and agro-industrial goods, as well as documents representing such goods, rights thereon, derivatives based on these goods and related contracts. It was part of the government’s effort to create market institutions to support the country’s liberalization programme. BMC is now a publicly traded company, with the government, through the Ministry of Agriculture, holding only a minor share. BMC has a large experience in providing physical trading as well as financial instruments to the commodity sector.

It offers spot and forward trading facilities, setting standard contract specifications and arranging for arbitration in case of disputes. It offers a procurement tool for “homogenous products” bought by a large number of government agencies, from the armed forces to municipal utilities. It provides registry functions for agricultural-sector invoices. Agro-industrial firms can defer the payment of withholding taxes if they register their invoices. It acts as a vehicle for the Ministry of Agriculture to provide subsidies, currency price risk management tools or minimum prices to certain sectors.

The exchange’s forward contracts, which are guaranteed by its clearinghouse (a subsidiary of the exchange), have helped producers to obtain finance. But in several of its products, the exchange has focused on bringing finance to the commodity sector, particularly through a highly innovative use of repo contracts; that is, contracts for immediate sale with future repurchase. Several types of repos are structured by and offered on the exchange. Among other things, it has offered repo contracts on warehoused commodities for a total of close to USD 400 million in the period from 2006 to 2008, almost half of its total volume; repos backed by the receivables from future commodity deliveries (some USD 240 million in the same period); and invoice discounting on commodity transactions. In 2009, its volumes on warehouse-backed and future-receivables-backed repos were respectively USD 113 million and USD 99 million. While not all of the exchange’s initiatives have succeeded, many of its products, along with its failed experiments, may well prove an inspiration for exchanges in other countries.

Government minimum price programme

BMC is the vehicle for the government’s price support programme for local maize producers. The goal of the programme is to reduce exposure

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179 The author would like to thank a number of industry experts, and, in particular, Juan Camilo Pryor, who were willing to share their insights and also, to comment on earlier drafts of this section.

180 The stake of government entities is 16.7 percent. Several of BMC’s brokers are among its largest shareholders, but other than the government, no single investor is permitted to hold more than 10 percent.

181 For example, flower exporters can register their invoices related to phytosanitary controls (to buy insecticides, fungicides etc.) with BMC brokers, and when they meet certain conditions, receive, through BMC, a subsidy on the related costs.

182 Including long-term capital market funding. For example, one sugar mill, Ingenio Pichichi, in 2005 raised Colombian $ 30 billion (USD 15 million) on the back of a forward contract traded through BNA and guaranteed by its clearinghouse. The transaction was structured by one of BNA’s brokers. The forward contract (valid for a year, but automatically renewed each year during seven years) and its associated economic rights were sold to a trust. This trust issued seven-year notes on Colombia’s stock exchange. Despite going through a difficult period, the bonds performed well at least until the end of 2009. For details, see Interbolsa, 2005 and BRC Investor Services SA, 2009. Similar deals using BNA forward contracts were structured by others, in the sugar sector (see Duff and Phelps de Colombia, 2003) and for bananas (the Colombian Banana Trust; see Guillén, 2004), though this issue went into default.

183 A similar programme was in place earlier for cotton and soyabeans. In the case of maize, in the past, the programme consisted of a combination of the purchase of a put contract, and the sale of a call contract. This arrangement would protect buyers against international price falls, but implies that they have to give up the price upside when prices increase beyond the call option’s strike price.
of local producers to international price variations. Colombia is a large maize producer, as maize accounts for four percent of employment in the agricultural sector. But its consumption as the main animal feed is even higher, making Colombia a large maize importer, which exposes farmers to the risk of falling international prices.

The Ministry of Agriculture enables maize producers to buy, through BMC, heavily subsidized put options on the CME. The Ministry pays 70 or 80 percent of the option premium, depending on whether the producer is large or small. It makes a fixed sum available on a first-come, first-served basis, with limits on the maximum amount available to each producer, to each region, and to each group of producers (small versus large). In 2011, this sum was sufficient to cover 67,000 tonnes of maize.

Producers have to register with BMC, provide proof of their maize production, and then apply to buy the quantity of options they need through BMC. They are not permitted to buy options for a quantity higher than their certified maize production. Producers can apply directly, as a group, or through a cooperative. BMC publishes each day between 13.00 hours and 14.00 hours the various option premiums, and producers then make their choice. They choose the contract month (September, October or December), the number of contracts that they wish to buy (one CME contract is for 127 tonnes) and the strike price, in USD. They retain exposure to exchange rate risk. The options have a fixed expiry date. After expiry, BMC remits the profits, if any, to the farmer’s account, but only up to the amount that corresponds to the quantity that the farmer can demonstrate he actually sold, through production of contracts or invoices.

184 The programme operates directly through BMC, not through its brokers.
185 See Ministerio de Agricultura y Desarrollo Rural, 2011.
186 In addition to their share of the option premium, producers pay a six percent fee to cover the risk of premium changes between the moment that rates are published by BMC and the moment that the option is actually bought on CME. Should the option premiums change in an unfavourable manner, the difference is covered by the programme.

Currency risk management

To help agricultural exporters in certain sectors to protect themselves from exchange rate volatility, the Ministry of Agriculture sponsors the purchase of Colombian $/USD put options. It has been used for many agricultural commodities, including bananas, flowers, sugar and cocoa; the coffee sector is not included, though. The programme works on the basis of annual budget allocations for specific sectors, with use on a first-come, first-served basis.

To avail themselves of the subsidies, which can reach up to 90 percent of the option premium, a company in an approved sector registers with a broker, demonstrating that it meets the criteria for participating in the programme. The broker then channels the orders to the exchange, and the exchange – not the broker – buys the options on the international market.

Financing forward contracts

In the early 2000s, BNA started a scheme for the financing of forward contracts. Under the scheme, a sugar farmer, for example, signed a forward contract with a sugar mill. He then ceded the rights to payment under this contract to an investor (through the exchange), against cash payment. In 2004, forward contracts for some USD 55 million of sugar and USD 40 million of barley were thus financed on BNA. The scheme took off quickly, but collapsed just as rapidly.

In 2005, operations were ceased after a government-owned company lost some USD 4.5 million in this type of transaction. The regulator closed down one broker involved in these transactions and took control of another. The main problem was that payment by the offtaker was conditional on the farmer delivering the product. If the farmer did not meet his delivery obligations, then the offtaker did not have to pay the investor. The structure did not incorporate any mechanisms to manage the risk of non-performance by the farmer, other than the due diligence that brokers were supposed to do. In 2009, the exchange proposed to reintroduce this

Innovative agricultural finance and risk management instrument with the new element of insurance to cover contract default by farmers, but the regulator did not accept the proposal.

### Invoice discounting

Commodity companies can sell or discount their invoices through BMC’s trading floor, and they can enter into repos on invoices. In the first case, the buyer of the invoice will present it at expiry and receive the payment as stipulated. In the second case, the original seller of the invoice buys it back at expiry for a pre-agreed amount. Until 2010, the clearinghouse guaranteed the transaction. For example, exporters can use BMC to offer repos on their export revenue. The process is that the exporter sells his export contract with the undertaking to buy it back after a certain period. This transaction is possible for a range of commodities: agricultural, mineral, and energy products. Repos can be for 30, 60, 90, 120, or 150 days. The payment under the invoice has to be assigned to the exchange clearinghouse, and the buyer of the physical products has to acknowledge the assignment.

188 Such insurance had been used in the early 2000s in the securitization of BNA-traded forward contracts by sugar mills such as Incauca Refinería de Colombia and Ingenio Pichichi. It covered the risk of non-delivery and non-payment of the forward contract, and could be triggered simply by the issuance of a certificate of default signed by BNA’s managing director. The insurance was not on the full notional value of the contracts, but on approximately one sixth of the total value, which was the “value at risk” because of volatile international sugar prices, calculated using the Black-Scholes option pricing model.

### Repos on agricultural stocks

BMC’s most-traded repos are based on a physical stock stored, in principle, in an accredited warehouse. It is used for a wide range of commodities. In order of importance for 2009, these include: coffee (34 percent of the total), rice (26 percent of the total), wood, potassium chloride, rum, polypropylene, cotton, coal, maize, and a series of less important products such as fertilizers, milk powder, and palm oil destined for biodiesel production. Figure 37 describes the repo mechanism.

The commodities are stored by a commodity producer, processor or trader under the control of a warehouse operator who has been accredited by the exchange. Commodity can be stored in a public warehouse, or in a field warehousing operation, where a collateral

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189 This option has been used, for example, for cotton ginning and spinning. The WHR is issued in terms of raw cotton, but the actual physical collateral can be in the form of yarn. 190 Only public warehousing companies (Almacenes Generales de Depósito), specifically accredited by the financial sector regulator (Superintendencia Financiera), are permitted to issue WHRRs. In addition, BMC’s clearinghouse has to agree that the warehousing company is capable of fulfilling all the requirements of the exchange’s internal regulations. Currently, there are four warehousing companies in Colombia authorized to issue CDMs. Two of them are majority-owned by banks that are part of financial conglomerate known as Grupo Aval; one is owned by the Colombian Coffee Growers’ Federation, and one by the Government of Colombia, with a minority stake of a large bank. Almost all repos are done on CDMs issued by warehouses that are bank-related. These warehousing companies manage their own public warehouses, but also engage in field warehousing operations, taking temporary control of a third party’s warehouse for the purpose of a financing transaction.

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**Figure 37**

**Exchange-traded agricultural repos**

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**Source:** Author
manager takes temporary control over a processor’s or trader’s warehouse. Warehouse operators are also permitted to issue WHRs when goods are not yet in their warehouse but in transit, as represented in a bill of lading, as long as the goods are destined for delivery at the operator’s warehouse. The warehouse operator is responsible for weighing and quality grading. He issues a certificate of two-part WHRs, consisting of a certificate of deposit or certificado de deposito de mercancias (CDM), and a pledge certificate or bono de prenda (BP).

The BP is immediately cancelled as the warehouse operator knows that the CDM will be used for a repo transaction. The CDM is transferred by the depositor or the owner of the commodities to an exchange broker. This owner asks the broker to sell the warrant, simultaneously signing a repo that commits him to buy it back at a given price after a specified period. The warrant is then ready to be auctioned on the exchange. After auctioning, there is a secondary market. The purchaser knows that he will be entitled to a cash sum at a defined point in time: the broker has the obligation to buy back the repo at its expiry date, with the payment (in many repos) guaranteed by the clearinghouse and further underwritten by the physical goods in the storage facility.

Until early 2010, all CDM repo transactions were guaranteed by the exchange’s clearinghouse. After this date, BMC introduced the option of clearing on repos without central counterparty. In this scheme, in the case of a default, the clearinghouse will not pay the investor but will auction the asset on his behalf. If there is no buyer interested, then it hands the asset over to the investor.

Table 19 gives an indication of the costs of a CDM repo transaction.

It should be noted that while CDM-backed repos are generally for a large amount (USD 50 000 to USD 100 000), in effect, brokers often put together a large number of small investors (in

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191 This option is used for import and export operations. The bill of lading as well as the insurance contract for the goods in transit have to be assigned to the operator of the port warehouse that is the destination given in the bill.

192 Such two-part WHRs are common in civil law countries. In a normal WHR financing, the owner would retain the first, and use the second as a credit instrument. However, in a repo transaction, it is the CDM that is sold while the pledge certificate is cancelled.

193 But this secondary market for any type of repos is not very active. In 2009, secondary trade in repos was only USD 36 million; and, for example, on the secondary market for cattle-backed repos there were only six to seven contracts a day. The main reasons are the prevalence of small retail investors in the market. Institutional investors are not interested in taking part in the market because of a lack of rules regulating valuation and risk measurement, and the short term of the transactions, most being less than 180 days.

194 The transactions are over-collateralized, with the CDM/repo transaction representing only 70 to 80 percent of the value of the underlying goods. Until 2008, for many commodities, there were also further guarantees by a government fund.

195 The exchange has tried to introduce CDM repos for smaller, standard sizes. For example, in 2007, it launched repos on frozen shrimp with the size of a contract fixed at 12 tonnes, but these did not succeed.

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Table 19
Illustration of the financial aspects of a CDM-backed repo transaction
(in thousand Colombian pesos, $; 1 USD ≈ 2 000 $)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notional value of the receipt</td>
<td>1 500 000</td>
</tr>
<tr>
<td>Collateral value of the receipt (70%)</td>
<td>1 050 000</td>
</tr>
<tr>
<td>Term of financing</td>
<td>360 days</td>
</tr>
<tr>
<td>Effective annual interest rate</td>
<td>8%</td>
</tr>
<tr>
<td>Future value (repurchase price)</td>
<td>1 134 000</td>
</tr>
<tr>
<td>Costs</td>
<td></td>
</tr>
<tr>
<td>0.1% BMC registration fee</td>
<td>1 050</td>
</tr>
<tr>
<td>0.5% clearinghouse fee¹</td>
<td>6 825</td>
</tr>
<tr>
<td>2% brokerage fee</td>
<td>21 000</td>
</tr>
<tr>
<td>0.3% warehousing charges</td>
<td>4 500</td>
</tr>
<tr>
<td>Interest charges</td>
<td>84 000</td>
</tr>
<tr>
<td>Received by the producer on the day of sale of the repo</td>
<td>1 016 625</td>
</tr>
</tbody>
</table>

Source: Figueroa, undated presentation.
the range of USD 500 to USD 7,500 each) to bid on the issue. While the exchange assigns the appropriate part to each individual investor, the actual CDM remains under the control of the clearinghouse and is not broken up.

While CDM-backed repos have done well by and large, there have been a number of problems, in particular in situations where Colombian practices and regulations differ from international best practices.

First, permitting a warehouse to issue receipts for goods that are not yet in a warehouse is not an internationally accepted practice. Even if a producer or trader can provide a bill of lading, there is a serious risk that the goods either do not exist or will be diverted to another destination. At the same time, experience has shown that in a commercial relationship between, say, an exporter and a warehouse manager, the manager can be pressured to issue WHRs in anticipation of future deliveries with the exporter assuring him that with the funds borrowed against the receipts, the goods will be bought and delivered to the warehouse. CDMs for goods ‘in transit’ have, indeed, led to a large default in Colombia in the case of coffee. When the broker failed to buy back the repos, the exchange found there was no coffee in the warehouse and none in transit. The clearinghouse had to compensate the investors, and settled the matter through a four-year payment arrangement with the warehousing company, the broker and the coffee exporter involved.

Second, internationally, banks are generally very careful when they finance against perishable goods or goods with narrow markets. On Colombia’s exchange, CDMs on illiquid and perishable goods such as stevia (an herb that can be used as a sugar substitute), turkeys, cottonseed and liquor have been used in repo transactions. In several cases, when payment defaults ensued, it proved impossible for the clearinghouse to recover the money it had to pay to the investor as the goods could only be sold at a large discount, if at all. In some cases, the goods were highly perishable and the search for a buyer took so long that the goods went bad.

**Securitizing cattle receivables**

In 2000, BNA staff, who later left to set up their own investment banking firm, introduced a relatively complex system for structuring repos around future receivables for livestock producers. Repos were not structured around individual producers; but rather producers were grouped into a trust, which then issued securities.196

The first securities issue was in June 2000. From then until 2003, a total of 21 series of notes were issued through two different trusts. The total funding raised was Colombian $92 billion (around USD 46 million) for the benefit of 491 farmers. Funds for the feeding of beef cattle were raised from local institutional investors through livestock-backed securities offered and traded on the BNA and the country’s securities exchange. The structure, arranged under the overall supervision of BNA as agent of the cattlemen, is described in Figure 38.

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As can be seen, the transaction was highly structured to reduce risks for the investors to the minimum. Cattlemen in selected regions who met certain selection criteria signed contracts with a trust, under which they transferred the ownership rights to their cattle. The trust then sold securities on the basis of these contracts, and paid the farmers the funds received. To ensure that farmers properly fed their cattle, an independent company was recruited to provide extension and quality control services. This company was liable to the trust if its services were ineffective. The marketing of the cattle was controlled by an independent marketing agent, who was obliged to transfer the funds received to the trust, which assigned them in priority to the “repurchase” of their cattle by the cattlemen. In effect, cattle sales generally were through the BNA auction system. Insurance covered the risk of criminal or terrorist acts. The revenue from the milk produced by the cattle was also assigned to the trust.

The first issue and the following ones were independently vetted by a rating agency. The value of the collateral much exceeded the value of the securities issued. As a result, the securities initially received a high local rating from the local rating agencies. When problems arose because some cattlemen defaulted on their obligations to the trust, the notes were downgraded; but because of the risk cover by BNA’s guarantee fund, they remained investment grade.

Despite the high level of structuring and the high rating, this securitization structure ran into problems. In the end, defaults in several of the series had reached almost two percent of the total issue size.197 The technical supervisor found that some of the cattlemen failed to achieve the transaction’s growth objectives. As it had the right to do, the trust then stepped in, taking the cattle away from these farmers and giving them to other farmers to continue their fattening. Unfortunately, in the end, there was a very high concentration of risk on a few farmers who then actually failed to deliver the cattle as had been agreed, partly because they illicitly sold the cattle to third parties, and partly because of cattle theft. As a result of this experience, the exchange shifted to simpler one-producer repos.

Repos on contracts for future delivery

Towards the end of 2002, BNA introduced repo transactions for cattle, pork and poultry. The underlying security was not a commodity in stock, but rather, the process of fattening of these animals. Through the exchange, investors could invest in this process from the purchase of the young animals to their sale, a certain number of days later, to a slaughterhouse. The maturities were set by the exchange: 90 days for poultry, 105 days for pork and a range of tenors from 90 to 360 days for cattle.

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As individual notes were deliberately kept small – up to around USD 1 000 (the cattle-backed repos were up to USD 7 500), they were widely traded by retail, corporate and institutional participants. In countries where there is a large spread between “prime” deposit rates and “prime” lending rates, this kind of contract can be very attractive to investors and borrowers alike. In the case of Colombia, repos permitted agricultural firms to reduce their financing costs by half, and investors to achieve a yield considerably above that of bank term deposits. For example, in 2009, the yield on cattle repos was eight to 10 percent, compared to five percent for term deposits.

Towards late 2008, things started to go wrong with some of the repos on pork and cattle. This trend was triggered, but not necessarily caused,
by developments in the physical market. An epidemic of swine fever had reduced demand for pork, leading to price falls. In the case of cattle, political strain led to the closure of the borders with Venezuela, stopping beef exports to that country and leading to a 30 percent fall in beef prices in Colombia. Producers were unable to make full payments to BMC brokers, and the brokers increasingly had problems in buying back the repo contracts. The obligation to do so was on them, not on their clients. When it tried to take possession of the pork and cattle being financed, the clearinghouse found, in several cases, that the funds had been diverted to other purposes, and there were no animals. In the face of accumulating unpaid amounts, BMC decided in March 2011 to temporarily halt all its cattle, pork and poultry repo contracts.

Nevertheless, a difficult market environment alone is not sufficient explanation for the defaults. Among other things, a buffer against price falls was already built into the transactions: they were negotiated at a 15 to 30 percent discount to notional values. In particular, in the case of the cattle contracts, it appears there were serious shortcomings in the transaction structuring, with insufficient due diligence done on the robustness of the companies that were being financed and weaknesses in the ways risks were laid off to third parties. For example, guarantees and insurances were later found to be nonexistent. Deals were structured by the brokerage companies that then sold the repo contracts on BMC. Within most brokerages, there was no proper separation between structuring the deal and approving its risks, and several actually did not have an arms-length relation with the producers financed. Furthermore, both brokers and the clearinghouse made too little effort to diversify risks among clients and products.

From concept to implementation: the need for impeccable risk management

BMC’s ability to innovate exchange-traded contracts has been remarkable. Its ability to actually implement as per plans, however, has not been perfect. The structures developed and traded on BMC have great potential. But as they are based on structured commodity and trade financing techniques, they carry risks if they are not tightly structured, with all risks properly identified and managed.

In CDM-backed repos, the exchange accepted in-transit products as well as perishable, thinly-traded commodities as underlying for transactions. In a bank-structured finance, such underlyings would have been accepted only with a much higher level of structuring. And in the case of the repos, the clearinghouse was overly lax in its control over the underlying transactions. It almost invariably depended on documentation provided by the broker, and did not undertake any independent due diligence nor control the actual flows of money. It did not even look over the payments that were supposed to be made by the buyers of the livestock. While it did receive reports on the health and growth of cattle from the technical agents during the life of cattle financing transactions, it basically waited for farmers to pay. There were no such reports to review for poultry or pork. Because of this situation, it was common for producers to roll over positions to extend the term of financing. In fact, even though the longest authorized contract, in the case of cattle, was for 360 days, brokers convinced the cattlemen that this was a mechanism that would allow finance for several years because of the roll over system.

More rigid structuring, matching the risk management tools used to the underlying risks of the commodity and the transaction, and then the active monitoring of the transactions, would have avoided most of these problems. Furthermore, the opportunity for producers to raise funds directly on the capital market would have been left intact.
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