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**AGRICULTURE, BIOENERGY
AND FOOD POLICY IN UKRAINE
— ANALYSES, CONCLUSIONS
AND RECOMMENDATIONS**





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This book is the first issue of outcomes of the applied research conducted by the German-Ukrainian Policy Dialogue in Agriculture at the Institute for Economic Research and Policy Consulting. The scope of issues covered is broad reflecting the complexity of agricultural development itself. The reader finds independent and thorough analysis as well as policy recommendations for reforms and development of specific sectors delivered by economists to a broader audience committed to the opportunities of Ukrainian agriculture, food industry and bioenergy.

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Foreword of Yuri F. Melnik

Minister of Agrarian Policy of Ukraine

Dear Colleagues, dear Friends,

Traditionally, the agriculture and food sectors have been very important for the Ukrainian economy. For the last two years, agriculture has been showing positive trends of growth of production volumes and attraction of investments. Our mutual goal is to transform the agrarian sector into a highly efficient and competitive sector of the economy to ensure food security for the country and to be able to export production surplus.

Today the Government of Ukraine pursues a support policy that is based on the "State Targeted Program for Rural Development till 2015". The Program sets priorities in investment promotion and favorable investment climate, support to the development of market infrastructure, protection and rational use of land, development of rural territories, innovations for crop and livestock production, food safety standards as well as development of biofuels.

The WTO accession and the gradual approximation of the policy and legal framework to those of the EU will strengthen the sector through improved food quality and safety, enhanced competitiveness, and access to international markets. In this way Ukraine will increase its share on growing world food and energy markets.

Foreign partners may contribute to this development not only through financial but also through intellectual investments into agriculture, knowledge transfer, and exchange of experience.

Independent analysis of crucial agrarian policy issues by the German Advisory



Group based at the Institute for Economic Research and Policy Consulting are useful for policy makers to improve policies aimed at agriculture and food sector growth. This book will certainly be a guide for some of the most relevant issues of agrarian transformation in Ukraine: competitiveness, fiscal support, trade policy, land reform, support of sugar, grain and dairy sectors, development of biofuels.

I would like to thank the authors and editors for their independent and critical reflections during the preparation of the materials for this book that have been produced in the framework of the Ukrainian-German Cooperation Program in the agricultural sector.

I am sure that the combined efforts of all working in the sector in Ukraine — including our foreign partners — will lead to a new era of sustainable growth of agricultural potential of Ukraine.





Foreword of Horst Seehofer

Former Minister of Food, Agriculture and Consumer Protection

Dear Readers,

Many years of successful cooperation are connecting Germany and Ukraine.

Today, Germany is the second-largest trading partner of Ukraine. This positive trend and the increasing globalization, the approximation of Ukraine to the EU as well as the preparation of WTO-membership have been the reason to launch the bi-lateral cooperation project: "German-Ukrainian Policy Dialogue in Agriculture" in the beginning of 2006.

With the Institute for Economic Research and Policy Consulting, one of the leading Think Tanks in Ukraine, a professional project partner has been selected for the execution of the project. From the beginning, the German-Ukrainian Policy Dialogue in Agriculture concentrated on topics of central importance, for instance the impact of WTO accession on the agriculture and food sector as well as the perspectives of bioenergy or legal requirements for effective land markets. Domestic and international experiences in key areas have been analyzed and important recommendations for the agricultural policy and legal framework have been given.

I am particularly glad that improved framework conditions of the Ukrainian agriculture and food sector are increasing investment and cooperation opportunities for German investors in agriculture and agribusiness. Due to successful cooperation with many Ukrainian partners the project developed to an important service provider for agricultural policy facilitation.

This publication summarizes a considerable part of the achievements of the first two years of project work and delivers precious information and advice for policy makers and investors. I would like to take this opportunity to thank all those who contributed to its finalization.

**Foreword of Alex Lissitsa**

President of the Association "Ukrainian Agribusiness Club"

The agricultural sector of Ukraine was a "problem child" for the national economy for a long time. However, the situation has completely changed over the last two years. Rising international food prices attracted huge attention of domestic and foreign investors to primary agriculture. As a result, access to finance has improved and several Ukrainian agricultural companies have been listed on international stock exchanges.

The agricultural and food sector in Ukraine is currently experiencing radical structural changes with wide-reaching consequences for policy makers, agricultural markets and rural areas. Increasing crop yields in 2008 can already be seen as a success of those investments and structural changes. This will foster Ukraine's role as a global player on international agricultural commodity markets.

Although considerable efforts have already been undertaken, the development of the agricultural and food sector in Ukraine is lagging behind of other European nations. Now is the right time to close this gap. Rising demand on global markets, increasing profitability of agriculture, revolutionary developments in biotechnology and information technology offer thrilling opportunities for Ukraine to increase its international competitiveness in agriculture. As a result, agriculture could become a locomotive in the economy and serve to promote rush development in the country.

In order to use these opportunities, political will is required to move forward with reforms that improve the governance of agriculture. Such reforms are

needed for establishing a predictable long term agricultural policy including modern taxation and state support systems in agriculture, transparent markets, deregulation of the sector and improved access of Ukrainian farmers to international markets and knowledge. Political will is also required for the establishment of the farmland market. Underdeveloped farmland markets and especially the moratorium for farmland sales have been considered as barriers for further investments in Ukrainian agriculture and as a reason for the low productivity level in the sector. The sugar, dairy, beef and pork producers have been waiting for years without avail for state restructuring programs and long-term Government strategies. Biofuels as a potential source of renewable energy offer new market possibilities for Ukrainian agricultural producers. However, there is also no clear strategy.

These issues are discussed and important recommendations are given in this book written by a team of Ukrainian and international experts. I am certain that this book will become a reform guide for Ukrainian policy makers, scientists and agricultural producers.



Foreword of Franz Georg von Busse

Chairman of the Working Group on Agribusiness of the Committee on Eastern European Economic Relations within the Federation of German Industries

The Working Group on Agribusiness of the Committee on Eastern European Economic Relations within the Federation of German Industries unites leading German business associations and companies in the field of agriculture and food industry interested in investing in Ukraine. The working group was founded as a platform for policy dialogue and business contacts about ten years ago. The Institute for Economic Research and Policy Consulting (IER) in Kyiv has been an important partner for many years.

We therefore greatly appreciated the initiative of the German Federal Ministry of Food, Agriculture and Consumer Protection when it launched its project on "German-Ukrainian agricultural policy dialogue". The project is coordinated by Dr. Heinz Strubenhoff, who himself was engaged in our working group for many years and is aware of the problems foreign companies doing business in Ukraine experience.

We have thus been able to quickly identify issues of common interest to German and Ukrainian agribusiness. Dr. Strubenhoff and his team have analyzed barriers to investment in agriculture and agribusiness as well as general issues of agricultural policy reform and the land market. In addition, a great deal of research was performed in cooperation with German and Ukrainian experts from business. These research projects focused on questions concerning the development of specific sectors like sugar, milk, and biofuels and addressed problems such as the production of counterfeit pesticides.

The IER's discussion papers provide politicians and the business community with a deeper insight into the political options and their economic consequences. They are therefore an important tool to help facilitate dialogue between science, business and politics and to develop a sensible, balanced agricultural policy for Ukraine.

This book gives us a chance to look back at the work that we have been engaged on together during the past two years. But we are all very much aware that major challenges remain to be tackled in the coming years. Currently Ukraine is in a position to play on its strength of being able to produce large quantities of agricultural crops for the world market, but the turn-around in markets such as milk and meat production has still to be achieved. After Ukraine joined the WTO in May 2008, it expects a serious decline in food production which will lead to a restructuring of its food industry. Ukrainian policymakers therefore have to develop concepts which promote investments in the country's internationally competitive food industry. Much remains to be done to enhance the deployment of modern agricultural technology in Ukraine; it is our hope that the enhanced Free Trade Agreement with the EU will deliver a coherent framework for this.

We assume that there is a significant level of demand for Economic Research and the development of policy recommendations in the area of agriculture and food industry in Ukraine. We are thus looking forward to continuing our constructive and inspiring collaboration with the Institute for Economic Research and Policy Consulting into the future.

Introduction

Background and Purpose

The Black Sea Region together with South America are those regions in the world where the gap between agricultural potential and actual performance is the highest. This is the basis of above-average future agricultural growth in Ukraine supplying growing domestic and global markets with agricultural commodities, bioenergy and food. Both agriculture and the food industry in Ukraine reflect these opportunities by growing domestic and foreign investments. Current inflow of capital, managerial skills and new technologies will make the sector more efficient and competitive. The process will be further accelerated by the WTO membership and approximation of the legal and policy framework to the EU that support the overcoming of old habits and discredited policy support measures. Recently, various successive Ukrainian governments pursued an agricultural policy of excessive regulations, hand-steering and export restrictions out of the fear that export-orientation would undermine food security in the country. The argument behind was quite simple — to secure stability of internal food prices thus protecting the well-being of people. However, we argue that food security needs a strong and competitive sector to produce abundant and cheap food. Integration into world markets will increase competitiveness and make Ukraine a global player on world markets. At the same time food for Ukrainian consumers will be produced cheaper through efficiency gains. We trust in the entrepreneurial skills of farmers and agribusiness managers in Ukraine to make this happen.

Agricultural policy analysis is a fascinating challenge for economists. Growth in agriculture is a complex phenomenon and there are many factors that influence the development of the sector. The German-Ukrainian Policy Dialogue in Agriculture at the Institute for Economic Research and Policy Consulting is conducting applied research and policy advice on demand for various public and private actors. The project is funded by the German Federal Ministry of Food, Agriculture and Consumer Protection as well as the German Centre for International Migration. The aim is to present views and recommendations that are independent of government and business interests. The collaboration of Ukrainian and German experts from the public and private sector is particularly useful in view of fruitful critical discussions and meaningful results.

From the beginning of 2006 we developed various analytical notes and policy papers requested by the Ministry of Agricultural Policy, the State Land Committee, the Secretariat of the President and the Ukrainian Parliament. Analytical notes have also been requested by the World Bank as well as business associations in Ukraine and Germany. The issues cover a large area of interests and reflect relevant and important public debates in 2006 and 2007. The reasons of

combining and editing selected policy papers in a book are twofold. First, we have been asked by various Ukrainian and international organizations to make our findings available to a broader audience beyond our primary target groups. Second, we think that some contributions and applied methods may serve as training and education materials for advanced studies in agricultural economics at higher education establishments in the country.

This book is the first one of the German-Ukrainian Policy Dialogue in Agriculture. However, it continues a long tradition of joint publications of the Institute for Economic Research and Policy Consulting and the German Advisory Group. The authors of the book are members of the Institute and members of Ukrainian and German specialized organizations. Most of them are opinion leaders and offer unrivalled competence in their field of expertise. Most of the authors are economists but the contents and results are not academic. The basic idea of the contributions is to present methods and results from an economic point of view for non—economists. Policy and law makers as well as the media appreciate clear and concise messages. Applied quantitative methods are important for rational reasoning but they are always kept as simple as necessary to solve a specific problem.

Structure of the book

The book is divided into four parts. The first part on policy reforms starts with the presentation of the competitiveness of Ukrainian agriculture based on Domestic Resource Cost calculations. The analysis shows that Ukrainian farms are highly heterogeneous and only a minority share of farms are competitive for some products. Policy makers may conclude that there is a need for accelerated structural change in the sector. The second paper deals with distortions to the incentives producers are facing in Ukraine. The calculation of Nominal Rates of Assistance for agricultural products, combining the effects of direct and indirect policy measures, show considerable variation across products and time. Between 1992 and 2005 it had been negative for most of the products, an indicator that the combined policy measures did not always lead to the results expected. The third paper presents fiscal support measures in agriculture and develops some recommendations for corrective actions. The fourth paper is dealing with the impact of WTO accession on the agriculture and food sector in Ukraine.

The second part is dealing with land markets and investments, two key strategic issues for future agricultural growth. The first paper presents benefits and costs of free agricultural land markets in particular in view of the lifting of the moratorium on sales of agricultural land. The second paper gives an overview on necessary legal and institutional aspects to make the land markets functioning and the institutions dealing with land registration and titling credible. Both papers come to the conclusion that precious time has been lost to create transparent

and competitive markets for agricultural land and that functioning land markets are crucial for future agricultural development. The third paper deals with barriers to investment and growth. It combines the analysis of trade barriers with an agribusiness survey of the perception of agribusiness operators of the most critical factors impeding investments. The fourth paper deals with the development and funding of farm advisory services in Ukraine in comparison with such services in the EU.

The third part presents sub-sector analyses and policy recommendations. The first two papers deal with the sugar sector comparing developments and options in Ukraine with the recent sugar market reform in the EU. The papers come to the conclusion that the sugar sector in Ukraine needs better predictability through long-term and tradable production quotas. The next paper on grain export quotas is a critical reflection of the losses of trade restrictions for the Ukrainian economy. The paper argues that grain export restrictions are shifting welfare from producers to consumers with the gains for consumers lower than the losses for the producers. The overall result for the whole economy is negative due to producer welfare losses and lower investment and growth. The paper argues that free trade would be the better option combined with targeted support for the poor. The fourth paper presents results of the analysis of the competitiveness of the dairy sector. The results imply that the dairy sector shows interesting opportunities but that currently only a minority of farms is able to compete on world markets. Efficiency increases through investments and introduction of international standards would improve competitiveness. The last paper in this part deals with regulatory needs for genetically modified organisms. It is assessing the legal situation in Ukraine comparing it with international practices and comes to the conclusion that more should be done to enforce current laws in the country.

The fourth part presents analytical and policy papers on bioenergy. The first paper presents results of profitability calculations for producing biofuels using rape seed and grain. The major determinants of profitability are price ratios of crude oil, feedstock and by-products. Assuming price ratios of 2006 and before biofuels have not been profitable in Ukraine without subsidies. The paper presents three different scenarios for future development of biofuels in Ukraine. The second paper is assessing the competitiveness of different feedstocks for the production of biofuels, biogas and heat in Ukraine. It concludes that those raw materials that do not compete with food markets offer interesting perspectives for future development of bioenergy. This is wood, straw and agricultural and communal waste. The third paper is presenting options for green house gas emission trading in agriculture according to the Kyoto protocol. It concludes that carbon projects must have a minimum critical size to reduce project risks and to attract international investors. This is reducing the number of promising projects in the agricultural sector.

Acknowledgements

This book has been produced on top of the daily work load at the Institute. The editorial process would be impossible without encouragement and support through various friends and colleagues in Ukraine and abroad. As the editors of this book we would first of all like to express our sincere gratitude to many colleagues working in the Government, the Parliament, the Secretariat of the President and the State Land Committee. Many hours of critical reflections and exchange of views have been a source of constant motivation. We did not always share the same opinion but the discussions were always friendly with a mutual esteem of professional capabilities and trust. Of course, we had the advantage of expressing our views in a more independent and sometimes more critical way.

We would also like to thank the representatives of Ukrainian and international businesses. The view of business operators and lobby groups is particularly important for steering our work to relevant and meaningful issues. It makes our work effective. Representatives of business associations and companies were always ready to discuss specific sector problems and to share with us relevant information and advice. In particular, we would like to thank Dr. Alex Lissitsa, President of the Association "Ukrainian Agribusiness Club" and Leonid Kozachenko, President of the Ukrainian Agrarian Confederation for their constant support and willingness to discuss relevant issues.

We constantly receive a lot of inspiration from friends in the media. Journalists are an important ally in shaping public discussions and we are proud that we developed a good network with dedicated journalists dealing with agriculture and agribusiness. Journalists appreciate independent views and sometimes shared with us their talent to make a long story short enough to be delivered to policy makers and the broader public.

The work had not been possible without the funding of the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) as well as the German Centre for International Migration (CIM). The support of the German Embassy and access to professional expertise and organizations in Germany has always been very helpful in our advisory work. We would also like to thank the Committee on Eastern European Economic Relations within the Federation of German Industries in Berlin. The joint organization of events on sugar, dairy and bioenergy development brought together experts from the private and public sector from both countries and broadened our view on sector issues. Last but not least we would like to thank colleagues and friends from international organizations, i.e. World Bank, European Commission and FAO for constant support, exchange of views, critical feedback and encouragement.

Writing a book is a team exercise. We are therefore very glad of the support of



all members of the “agro team” of the Institute for Economic Research and Policy Consulting in the editorial process. All colleagues said enthusiastically yes to this time-consuming and challenging project. In this respect we are particularly thankful to Anna Kuznetsova, Vlad Konovalchuk, and Serhiy Kandul for dedicated and thorough proof reading and commenting as well as Iryna Slavinska and Anna Kolomiytseva-Terets for formatting and design work. It was very encouraging that all team members pulled into the same direction to deliver this book to a broader audience.

Veronika Movchan

Igor Burakovsky

Heinz Strubenhoff



Part I: Policy Reforms



1. The International Competitiveness of Agriculture in Ukraine

*This chapter is based on work from 2007 requested by the World Bank. The paper explores the potential in particular for export-led agricultural growth in Ukraine. It begins by considering the development of Ukraine's agricultural trade and the currently bullish outlook on international agricultural markets. Then a detailed, product-by-product analysis of the competitiveness of agricultural production in Ukraine is presented. The applied method is based on the calculation of **Domestic Resource Cost (DRC)** for product groups and groups of farms. This analysis shows that Ukrainian farms are highly heterogeneous and that currently only a relatively small proportion of these farms are competitive for some products. The chapter is closed with some suggestions for policy measures that would increase the competitiveness of Ukrainian agriculture and enhance its ability to contribute to higher standards of living in Ukraine.*

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Agriculture's role in the Ukrainian economy and Ukraine's agricultural potential

Agriculture's role in the Ukrainian economy

The agri-food sector is an important part of the Ukrainian economy. Agricultural production accounts for roughly 10% of Ukrainian GDP, and food processing for roughly 8%. If the industries upstream from agriculture (farm machinery, fertilizer, agricultural chemicals) are added, the agri-food sector's share of GDP in Ukraine approaches 25%. In 2003, 28% of the country's employed worked in the agri-food sector, and almost 32% of the country's population lives in rural areas.

It is well known that the share of agriculture in production and employment falls in the course of economic development, as the shares of the industrial and later service sectors increase. Figure 1 illustrates this trend for a cross-section of Former Soviet Union (FSU) countries and the EU. It also shows that Ukraine has followed this trend in the years since Independence. However, in the case of Ukraine this trend is not a result of textbook long-run forces (relative sectoral rates of technical change, Engel's Law, etc.) at work in a full-employment economy. The entire Ukrainian economy, including agriculture, is operating well below its production frontier. Tiffin (2006) presents the results of econometric efficiency estimates that suggest that Ukraine was producing only roughly 22% of the output it could give its factor endowments in 2000, down from 49% in 1990. Hence, shifts in sectoral GDP shares since Independence have been primarily driven by the sector-specific depths of the transition crisis (up to 2000) and different rates of partial recovery ever since. There is no reason why agriculture's GDP share could not remain constant or even increase in the medium term, if the sector were to embark on a path of rapid reform, restructuring and recovery. This might slow but would likely not reverse the decline in agriculture's employment share.

Ukraine's agricultural potential

Ukraine's agro-climatic endowment provides the basis for a large potential in agricultural production. Over 80 million hectares of agricultural land, of which roughly 33 million hectares are arable (World Bank & OECD, 2004, p.1), provide an excellent basis for the production of temperate crop and animal products. Over one-half of Ukraine's arable land is composed of black chernozem soils, ideally suited for field crop production, and roughly one-third of the worldwide stock of these soils is located in Ukraine.

Due to Ukraine's relatively low population density¹, acreage-based production potential implies export potential. Although incomes have grown rapidly since

¹ Ukraine's population density is 77 inhabitants/km². For comparison: World average—48; India—336; China—137; USA—31; Argentina—14; Russia—8.4 (Wikipedia, 2006). If only agricultural land is considered, Ukraine's population density (1.17 inhabitants/agricultural ha) is less than the world average (1.28) (FAO, 2006).

2000, increasing domestic demand for food, Ukraine has the capacity to produce much greater volumes of temperate grains, oilseeds and livestock products than its shrinking population can be expected to consume. Ukraine's agricultural export propensity is supported by additional geographic advantages. The country's Black Sea harbours remain ice-free year round and provide direct access to world markets. Moreover, Ukraine is close to important agricultural import markets in the Middle East, the Former Soviet Union, North Africa and the EU.

These natural advantages are moderated by several important factors. Precipitation is often a limiting factor for crop production, falling from an average of roughly 700 mm/year in the Northeast to as low as 300 mm/year as one moves South and East. Winters can be harsh and are not always accompanied by enough snow to protect winter crops and provide sufficient moisture in the spring. It is fair to say that some combination of drought and winter-kill will have a significant impact on agricultural production every 3—5 years; the last examples of this being the poor and very poor harvests recorded in 2000 and 2003, respectively. According to some forecasts, global warming will exacerbate drought problems in the future, with Ukraine becoming hotter and drier on average.

Another limitation is, paradoxically, soil fertility. The rolling landscape that characterises much of Ukraine's agricultural heartland is susceptible to erosion. Penkaitis (1994, p. 16) cites Ukrainian sources that refer to over 12 million ha of arable land as being significantly affected by erosion. As a result of distorted incentives, the vaunted chernozems have in many locations been literally "mined" of their nutrient and humus content over decades, compounding problems with moisture retention in years of low precipitation (see also Breburda, 1990; Spaar & Schuhmann, 2000; IER, 2006b, p. 2). The Chernobyl nuclear accident created additional limitations in the form of radioactively contaminated farm land. As the prevailing winds were blowing from South to North when this accident occurred, much of this contamination affected regions in what is now Belarus (e.g. Gomel) and Russia (e.g. Bryansk). However, 4 of the 10 most affected regions in the Soviet Union (Kiev, Zhitomir, Chernigov and Cherkassy in descending order of contamination) belong to Ukraine (Penkaitis, 1994, p. 16).

Finally, as agricultural competitiveness is increasingly determined by transformations that take place post-harvest in a complex food chain, the importance of natural conditions is declining. Anderson (1993, p. 305) illustrates that the Former Soviet Union was endowed at the outset of transition with a low stock of capital per worker and a high stock of natural resources per worker relative to the rest of the world. As agri-food systems become increasingly capital intensive, the comparative advantage implied by such an ample natural resource endowment diminishes. As is outlined in greater detail below, Ukraine's most important agricultural handicap and the essential threat to its competitiveness in agricul-

ture is that it combines its endowment of high-potential agro-climatic and geographic inputs with insufficient amounts of other key inputs such as human capital, marketing systems and policy facilitation. This is largely a result of Ukraine's difficult post-Soviet agricultural legacy. However, with each passing year blame must increasingly be attributed to inadequate agricultural policies leading to insufficient investment in the period since Ukraine's Independence.

Outlook on future agricultural markets and the positioning of Ukrainian agricultural products

Recent and forecasted developments on international agricultural markets

The overall outlook for agriculture world-wide is bullish. Prices for major agricultural commodities (grains, oilseeds and livestock products) on world markets are strong and appear to have levelled off in real terms, after almost a century of decline.² Of course, claims that the long-run decline in agriculture's terms of trade is coming to an end have often turned out to be premature in the past. However, there are indications of a fundamental shift in the constellation of rapid technical change against a background of more sluggish demand that has driven declining agricultural terms of trade for decades. Constraints on global availability of land and water appear to be increasingly binding. Marginal yield returns to conventional plant breeding programs for the major crops are declining, and genetic engineering has not (yet?) produced major yield increases of its own. While these factors reduce the growth of farm commodity supply, rapid income growth especially in South East Asia, where populations and income elasticities of demand for food are high, is accelerating growth in demand. Growing demand for biofuels is adding to this fundamental shift, although so far most of this demand hinges on subsidies and tax exemptions for biofuel production and use in the EU and the US.

Figure 2 presents data on the development of price indices for cereals, oilseeds and meat since 1980, and Figure 3 shows representative world market prices for key agricultural commodities since the early 1990s, together with the OECD's forecasts up to 2015. In both graphs, the strengthening of prices since the mid-to late-1990s is clearly visible. The OECD forecasts in Figure 3 suggest that prices are expected to remain strong and in some cases continue to increase in the foreseeable future. FAPRI (2006) forecasts are generally similar.

The prices and price forecasts in Figures 2 and 3 are nominal and largely based on quotations in US Dollars. Hence, how they translate into incentives for pro-

² Agricultural commodity prices are highly volatile and assembling consistent long run price series is difficult. This complicates attempts to identify and test the statistical significance of trends. For a discussion of some of the issues see IMF (2006b, Chapter 5).

ducers in Ukraine will depend on the future development of the Hryvna/US\$ exchange rate and of inflation in Ukraine. Significant devaluation of the Hryvna as a result of the financial crisis in 1998/99 corrected severe misalignment (Zorya, 2003) and provided agricultural producers (and other producers of tradable goods and services) in Ukraine with a major boost in competitiveness. Recent years have been characterised by slow real appreciation of the Hryvna, partially eroding increases in international prices. Future competitiveness will clearly depend on the continuation of stable and sustainable macroeconomic policies and the avoidance of major distortions due to macroeconomic misalignment. Agricultural producers in Ukraine are at something of an advantage vis-à-vis their competitors in energy-rich Russia and Kazakhstan at least in the sense that they do not need to fear the effects of possible real exchange rate fluctuations and Dutch Disease phenomena due to energy price volatility.

Along with prices, the volume of international trade for the major agricultural commodities has also grown in recent years, and is expected to continue to do so in the coming years, as illustrated in Figure 4. Again, OECD and FAO (2006) and FAPRI (2006) paint similar pictures of growing world markets for farm products, with oilseeds, pork and poultry experiencing especially strong growth over the least decade and expected to continue to do so over the next.

Ukrainian agricultural trade — recent and forecasted developments

Has Ukraine been able to profit from recent trends on world agricultural markets, and what are the forecasts of its future participation? Turning first to the past, Ukraine's agricultural export performance over the last decade has been mixed. As Table 4 shows, the last decade saw rapid growth in Ukrainian net exports of wheat, barley and maize, and significant contraction in exports of beef, pork and sugar. These trends must be interpreted with caution; however, as they refer to a time span over which Ukraine underwent great economic upheaval, from the depths of the transition crisis in the mid-1990s to first sustained recovery and growth in the first half of the current decade. Moreover, large percentage changes in trade volumes are due in some cases to the basis effect of low (actual or recorded) trade in the mid-1990s. Finally, Table 4 reveals that Ukrainian exports of many products, and especially grain, were highly volatile, with wheat exports for example falling by over 5 million tons from 1999 to 2000, and over 10 million tons from 2002 to 2003. Reducing these fluctuations — at least that part that is due to inappropriate agronomic practices and policy-induced volatility — would contribute to Ukraine's international competitiveness by increasing its reliability as a supplier.

Exports are heavily concentrated on three sets of destinations. First, Former Soviet Union countries, and especially Russia, play a dominant role as destinations for Ukraine's exports of dairy products. That this is a precarious trade structure

became apparent in 2006, when Russia banned imports of dairy products from Ukraine for several months. Second and third, the EU and Mediterranean Rim countries of Northern Africa and the Middle East are the main destinations for Ukraine's exports of grains and oilseeds. The fact that Ukraine has succeeded in penetrating the EU market for these products is encouraging, as this market is one of the most demanding in the world as regards quality and safety standards.

Altogether, there is currently no "absorption" problem on world agricultural markets. On the contrary, trade has expanded considerably and prices are strong, and no change in these trends is expected in the foreseeable future. Hence there is significant potential for expansion of Ukrainian agricultural exports, if competitiveness constraints are addressed successfully. Of course, forecasts of developments on world agricultural markets are notoriously difficult. However, Ukraine is clearly failing to take advantage of the window of opportunity offered by current favourable conditions, and this — along with the direct costs it implies — will certainly not make things any easier if and when world market conditions become less favourable.

Positioning Ukrainian agricultural products

The focus above has been on the markets for bulk agricultural commodities such as grains and oilseeds. However, as per-capita incomes and urbanization increase in key import markets, dietary changes will follow, leading to increased demand for livestock and processed food products. The question is whether Ukraine will satisfy this demand or remain primarily a supplier of bulk raw materials that are processed elsewhere. Clearly, the more value that is added in Ukraine, the more growth and employment the country will benefit from. However, as a product's degree of processing increases, so does the need for exporters to fulfil food safety requirements and quality expectations in target markets. And this is an area in which agro-climatic advantages do not play an important role — establishing and maintaining efficient systems to foster and certify food safety and quality is a question of institutions that no amount of good soil or sunshine can replace.

Ukraine faces significant challenges in the area of food safety. It is urgent that these challenges be addressed. To the extent that there are economies of scale in the "production" of safe, high quality agri-food products, the agricultural structure that Ukraine has inherited from Soviet times — with a relatively small number of large farms capable of producing large uniform lots, presenting a relatively limited number of control points, and providing attractive partners for vertically integrated chain management schemes — is advantageous. Hence, investments in food safety and quality systems can be expected to generate high returns.

The analysis below will demonstrate, however, that Ukraine's primary agricultural competitive advantage in the short run lies in its potential as a low cost sup-



plier of raw and lightly processed agricultural commodities — especially grains and oilseeds, vegetable oils and meals. While the safety and quality demands of the international grain and oilseed trade are certainly far from trivial (and growing increasingly complex due to the need to find a modus vivendi with genetically modified crops), the hurdles here are lower than in the case of, for example, meat and most processed food products. Ukraine has succeeded in penetrating the demanding EU market for these grains and oilseed products in the past. Ukraine is not a net exporter of livestock products, with the exception of dairy products which are mainly destined for Former Soviet Union countries whose standards and certification systems, for historical reasons, resemble Ukraine's. Tapping Ukraine's potential in the area of grains and oilseeds is a precondition for the competitive production of exportable surpluses of livestock products. Further development of reliable and efficient monitoring and testing systems for Ukraine's grain and oilseed exports is a logical first step that can provide experience and a basis for the development of more complex systems for other export products.

A related food quality issue concerns high-end, high-value added products of designated origin, products such as Parma ham and Roquefort cheese. The restructuring of agriculture in Ukraine in the first half of the last century destroyed many artisanal traditions that are the basis for such products, and decades of isolation mean that awareness of remaining Ukrainian specialties in foreign markets is low. With the exception of perhaps a few niche products, therefore, exports of such specialties cannot be expected to make a major contribution to the future development of Ukrainian agriculture.

Another positioning issue concerns biofuels, especially the "first generation" biofuels ethanol and biodiesel produced using grains and vegetable oils, respectively. Biofuels are currently a "hot" topic. As discussed above, there are indications that emerging energetic uses of agricultural commodities may fundamentally tip the balance of supply and demand forces on world agricultural markets in favour of the latter, perhaps even reversing a decades-old trend of declining agricultural terms of trade.

The question is whether Ukraine should actively embrace the domestic production of biofuels. There is evidence that while Ukraine is able to produce grains and oilseeds competitively, it is not able to produce biofuels that can compete with fossil fuels unless this production is heavily subsidised. This conclusion holds for a broad range of relevant prices, costs and technical assumptions. Subsidised biofuel production especially in the EU and the US has driven up prices on world markets for vegetable oils and grains, and Ukraine can essentially "free ride" by selling into these markets, essentially capturing other countries' subsidies. There is no sense in reducing this "bounty" by supporting a value subtracting industry at home.



The current status of Ukrainian agricultural competitiveness

Indicators of agricultural competitiveness

To provide an indication of the competitiveness of Ukrainian agriculture, Domestic Resource Cost (DRC) analysis (Monke and Pearson, 1989) is used. The DRC method is well established, so only estimation output and no rigor methodology description is provided in the Appendix to this paper. DRC measures the real domestic resource cost required to earn or save one unit of foreign exchange. It is defined as the ratio of the cost of the domestic inputs that go into producing one unit of the good in question to the difference between the price of that unit and the cost of the tradable inputs that go into producing it, with all inputs and output evaluated at social prices. If this ratio is greater than one, then the surplus of revenue over tradable input costs (in the denominator) is smaller than the cost of the domestic factors (in the numerator). In this case, production of the good in question is not competitive in the sense that the domestic inputs employed are not earning at least their opportunity costs. If the DRC is smaller than 0, then the denominator must be negative, in which case revenue does not even suffice to cover tradable input costs, let alone domestic inputs. In this case, production of the good in question is clearly also not competitive. Only if the DRC is between 0 and 1 is production competitive.

A weakness of the DRC method as it is usually applied is that it is based on average or "typical" data. The conclusions that can be drawn on the basis of average or typical indicators become progressively weaker, however, as the heterogeneity of the underlying population grows. Evidence from numerous studies that apply empirical efficiency analysis techniques (data envelopment analysis — DEA; and stochastic frontier analysis — SFA) to farm level data in Ukraine and other Former Soviet Union countries points to a very significant heterogeneity, with many farms operating at a great distance from the frontier defined by the best-practice farms.³ This evidence is confirmed by the observations of farm management and extension specialists who have experience with conditions in Ukrainian farming (e.g. Lischka, 2005). As will be discussed later, this heterogeneity is largely due to the fact that mechanisms (such as bankruptcy and a functioning land market) that force poor performers to exit in a market economy, freeing their resources for use by better performers, are not fully operative in Ukraine.

For this reason, and as outlined in the Appendix, farm-level data are used to calculate DRC distributions for major crop and livestock products in Ukraine. This procedure makes it possible to determine for each product what proportions of

³ See, for example, Galushko et al. (2004), Kurkalova and Jensen (2002), Lissitsa and Odening (2005), and Voigt (2002).

the farms in Ukraine are characterised by DRCs less than 0, DRCs between 0 and 1, and DRCs greater than 1, and what proportions of Ukraine's total production of these products occurs on the farms in each category. The hypothesis underlying this approach is that Ukraine has the potential to be internationally competitive in most important temperate crop and livestock products, if barriers to competitiveness are removed so that many more farms are able to operate at the levels of efficiency that currently only the very best are able to attain.

A limitation of the DRC analysis employed here is that it is based exclusively on the large commercial farm enterprises in Ukraine, and does not consider the household plots. This is not an important omission for the major cereals and oilseeds, which are primarily produced on large commercial farms (Figure A 1.5). However, household plots are responsible for a much larger share of the potato, fruit, vegetable and livestock production in Ukraine. Unfortunately, detailed data on methods and costs of production for household plots is not available. This may not be such a handicap for competitiveness analysis, however, as it is arguably the large commercial farms that will determine the international competitiveness of Ukrainian agriculture, while household production will remain largely directed at meeting domestic demand.

The current status of Ukrainian agricultural competitiveness

Results of the DRC analysis for major crop products in 2005 and 2004 are presented in Figures A 1.6 and A 1.7. Results for 2005 and 2004 are qualitatively similar, and the following discussion focuses on 2005. The distributions reveal that for wheat (44%), sunseed (41%) and barley (25%), relatively large proportions of the farms in Ukraine produce competitively. For maize (13%), rapeseed (10%), soybean (8%) and potato (6%), the corresponding proportions are smaller. For all of these products, the competitive farms account for a disproportionately large share of the total production by large commercial farms in Ukraine. This effect is especially extreme in the case of potato production. However, since large commercial farms account for less than 5% of all potato production in Ukraine (Figure A 1.5), this result — which suggests that a small number of large farms is heavily concentrated in potato production, perhaps for seed and special processing uses — is not representative should not be over-interpreted.

For sugar beet, only 2% of the farms in Ukraine are competitive, and these account for only 6% of all sugar beet production. This confirms the results of earlier analyses (e.g. Strubenhoff and Nivyeveskiy, 2006; von Cramon-Taubadel, 1999) that demonstrate that sugar beet production is, if at all, only competitive under very limited circumstances in Ukraine.

DRCs for major livestock products in 2004 and 2005 are presented in Figures A

1.8 and A 1.9. Focusing once more on 2005, a similar range of competitive and non-competitive shares of farms as for crop products is revealed. 40% of the farms that produce eggs have DRCs between 0 and 1; corresponding shares for beef, milk, pork and poultry are 22, 20, 8 and 4%. These competitive farms again account for a disproportionately large share of the production of these products (eggs 93%; milk 49%; pork 35% and poultry 21%). The only exception is milk, where the 22% of the farms that are competitive account for only 16% of the production by large commercial farms in Ukraine.

In both 2004 and 2005, and for all crops and livestock products except wheat in 2005, the modal or most frequent DRC is less than 0. This indicates that revenue does not even suffice to cover the costs of tradable inputs, let alone domestic inputs, for a large group of farms. These farms are subtracting and not adding social value by producing the products in question. Even if the resulting products are being exported, Ukraine is on balance losing foreign exchange in the process. More detailed analysis — for example using information on the location of individual farms in the dataset, their degrees of specialisation, factor intensities, etc. — is required to determine what factors influence whether a farm is competitive. The available evidence suggests, however, that efficient and inefficient farms often exist side-by-side even in the most agriculturally favoured regions of Ukraine. The fact that large numbers of value subtracting farms continue to operate suggests that much more must be done both in area of positive incentives and market disciplines to ensure that less efficient farms either improve or exit, freeing up resources for more efficient use by others.

The empirical analysis presented here demonstrates that many Ukrainian farms are able to produce wheat, sunflower seed, barley, eggs, beef and milk competitively. The same is true for maize, rapeseed, soybeans, and pork, but for smaller proportions of the producing farms. For all products, the majority of the farms in Ukraine are not able to produce sufficient surplus to cover the costs of domestic and tradable inputs. In many cases, the value of production does not even suffice to cover the cost of tradable inputs, indicating that production is subtracting, and not adding value. Overall, the findings here correspond well with Lischka's (2004, p. 110) estimate that roughly one-half of the farms in Ukraine are "... severely threatened... enterprises of highly questionable viability".

The fact that many farms are able to produce competitively bodes well for Ukraine's overall international competitiveness in major temperate agricultural products and processed foods. Realising Ukraine's competitive potential is a matter of i) shifting the distributions presented here so that the great majority of farms in Ukraine can produce as efficiently tomorrow as the best farms do today, and ii) developing marketing and processing systems so that Ukraine's ability to produce competitive raw products on the farm is translated into com-

petitiveness on world markets for value-added agri-food products as well. This would lead to increased rural income generation and foreign exchange earnings, and a greater contribution of agriculture to overall economic development in Ukraine.

Factors constraining agricultural competitiveness in Ukraine

The factors constraining agricultural competitiveness in Ukraine can be classified in many different ways. Factors overlap and can amplify one another, and factors that are of primary importance for one product or process may be irrelevant for others. The following list begins with general factors and proceeds to more specific ones. A unifying theme throughout is that all the factors discussed below are man-made; they can be changed if they are understood and confronted with sufficient political will.

Agricultural competitiveness in Ukraine is mainly constrained by the often glaring inefficiency of state support systems at three fundamental levels. The first of these is the macroeconomic level. Macroeconomic instability throughout the 1990s, beginning with hyperinflation in 1992—1994 and culminating in the financial crisis of 1998/99, severely handicapped Ukrainian agriculture (Zorya, 2003). In the late 1990s, the de facto adoption of a nominal Hryvna/US\$ exchange rate anchor coupled with continued double-digit rates of inflation lead to significant overvaluation of the real exchange rate. This taxed sectors such as agriculture that produce tradable goods. The financial crisis in 1998/99 “corrected” this overvaluation and increased the competitiveness of agriculture. Since then, agriculture in Ukraine has not suffered from similarly blatant macroeconomic imbalances. Nevertheless, a number of measures have had important influences on the development of agriculture. These include:

Reprivatisation

The announcement by the new government under Prime Minister Tymoshenko in 2005 that it would re-examine a number of past privatisations of state enterprises created considerable uncertainty for actual and prospective investors in Ukraine. While the need to address improprieties in several high-profile cases was widely acknowledged, it was never clear just how many cases would be re-examined and what mechanisms would ensure that this is done in an open and transparent manner.

Taxation

Frequent ad hoc changes to the taxation system and especially the question of VAT refunds on exports have plagued agriculture. In 2002—2004, exporters complained that they were not receiving VAT refunds. By the end of 2003, the

government's export VAT arrears (including, but not limited to agriculture) amounted to 6 billion Hryvnia (Demyanenko and Zorya, 2004). In some cases it was reported that a bribe of roughly one-third of the outstanding amount would secure payment. While the problem of export VAT refunds appeared to have been resolved in the course of 2005, it has recently re-emerged under the new government formed in 2006. Exporters who face the prospect of an uncertain or unlikely VAT refund respond by adding corresponding amounts to the margins that they deduct from border prices to determine the prices that they can afford to pay at the farm gate. In the final analysis, therefore failure to refund export VAT has the same impact as a tax on agricultural exports, lowering the farm gate price and masking some of the competitiveness identified.

Regulation

IER (2006a) reports that Ukraine is ranked 110 out of 155 countries worldwide in terms of the regulatory hurdles that must be surmounted to establish an enterprise. IER (2006a) also provides information on Ukraine's exceedingly complex and costly import regulation for important agricultural inputs such as machinery and agro-chemical products, and the amount of discretion that customs authorities wield in implementing these regulations. The regulatory environment in Ukraine increases the costs of doing business and forces economic activity into the "shadows". It slows the rate of technology transfer into Ukraine and fosters corruption.

At a second level, Ukraine lacks a clearly defined strategy to foster rural development and combat rural poverty. The result is added burdens on agricultural policy and agricultural enterprises. There are indications that economic growth since 2000 has reduced the incidence of absolute rural poverty in Ukraine (Galushko and von Cramon-Taubadel, 2004). Nonetheless, disparities between regions and within the income distribution have increased, and deep, local pockets of poverty remain. Large parts of the rural population produce for subsistence on their household plots, participating little or not at all in the cash economy. While the success of the household plots in increasing production of livestock and fruit and vegetable products since the onset of transition (see Figures A 1.5 and A 1.10) is rightly acknowledged, it poses future challenges that should not be underestimated. Household plots cannot capture economies of scale in production, and they make it much more difficult to capture economies of scale up- and downstream from agriculture (input supply, collection of appropriately sized lots for processing, food quality control). Hence, while household production clearly represents a valuable social "buffer" in the transition process, it must be seen, with few exceptions, as a dead-end in the development of Ukraine's agri-food export potential.

Furthermore, much of the increased volume of production on household plots

since the onset of transition (see Figure A 1.10) must actually be attributed to the large commercial farms. The generally underemployed members of these farms are given or take inputs such as feed, fertiliser or young livestock (e.g. piglets) for use on their household plots. Commercial farms are generally obliged to tolerate this activity in the interests of “keeping the peace” in the local community, and because stemming it (e.g. guarding fields and barns) is costly. Even where this “socialisation” of benefits has been brought under control, farms often remain responsible for providing elements of what is referred to as the “social sphere”, which includes schools and child care services, perhaps maintaining the local fire station and repairing local roads. The result is higher production costs and less liquidity for agricultural investments. Perhaps even more damaging is the fact that “keeping the peace” and managing the social sphere often diverts a great deal of a farm manager’s time away from questions of efficient production and marketing.

Third, Ukraine’s direct agricultural support policy is highly inefficient and distortive. The Government of Ukraine has significantly increased the financial support that it provides to agriculture in recent years (Zorya, 2006). In 2006, total fiscal support for agriculture was expected to reach almost 12.5 billion Hryvna or over 2% of Ukrainian GDP. Zorya (2006) shows that this is a level of support that is comparable with that in other middle income countries (Turkey, Mexico, Brazil, Russia). However, the fact that Ukrainian agriculture is underperforming suggests that this spending is not having the desired impact.

Figure A 1.11 shows that support has been erratic, fluctuating considerably from year to year in levels and in composition. Support is also highly variable across products. Indeed, it is a striking irony of Ukrainian agricultural policy that it taxes the most competitive products (oilseeds via the export tax, and grains via a variety of interference in exports over the years and most recently export quotas) and supports the least (sugar beet). This is scarcely a recipe for fostering competitiveness; on the contrary, artificially (privately) profitable sugar beet production draws inputs and expertise away from other crops where they would add, not subtract social value. Support is also very unevenly distributed across farms. For example, Zorya (2006) provides evidence that roughly 7% of the subsidised farms received almost 75% of all budget support to livestock producers in 2004. These three dimensions of instability — erratic over time, variable across products and uneven across farms — are all evidence of an unfocused policy that lacks strategic guidance.

The variability referred to above is what can be observed *ex post*. *Ex ante* this already muddled picture is further complicated by unpredictability. The grain export quotas introduced in late 2006 are a case in point. In the first months of 2006 there was no indication that this measure was in the offing. The justifica-

tions provided for it are highly questionable, and the damage it has done to Ukraine's reputation as a reliable supplier of grain and a dependable place to invest in agriculture is immense (von Cramon-Taubadel and Raiser, 2006). Lack of transparency and the government's ad hoc interference in agricultural markets increases uncertainty and risk.

Over the years, agricultural policy makers in Ukraine have failed to take a number of important steps, thus creating or perpetuating barriers to competitiveness. One such step is WTO membership. While Ukraine's delays in securing WTO membership cannot be attributed to agriculture alone, the agricultural chapter of Ukraine's negotiations with its working group has been among the most difficult. Ukraine's approach to these negotiations has been highly defensive, as if Ukraine had a successful and focused agricultural policy to defend. It has not concentrated on opening markets for Ukraine's competitive agricultural products but rather on salvaging as much protection as possible for value subtractors such as sugar. Furthermore, while negotiators in Geneva complain that Ukraine is not being given sufficient scope to support its farmers, policy makers in Kiev tax and destabilise markets for grains and oilseeds.

Policy makers have also taken too few steps to improve inefficient marketing and supply chains. Figure A 1.12 illustrates for the case of wheat that Ukrainian farmers get a much lower share of the export value of their crops than farmers in, for example, Germany. Important components of the difference are physical losses (due to poor harvesting and storage technology on the farm), inefficient and expensive infrastructure between the farm gate and export positions, and inflated margins due in large part to the uncertainties discussed above. Policy has actively contributed to perpetuating all of these problems. By taxing grain and oilseed production, policy has reduced the ability of farms to invest in technology that can increase production and reduce losses. By limiting competition in key areas of marketing infrastructure (for example, the railroad system) and upholding highly inefficient state agents such as *Khlib Ukrainy* (Bread of Ukraine), policy has slowed improvements in marketing infrastructure and reductions in marketing margins. Government intervention on grain markets — with export quotas in 2006 being only the most recent example — has repeatedly punished grain trading enterprises that have invested in improving marketing systems, especially at major inland elevators and at key Black Sea ports. The result has been significantly less investment than could have been the case, a reduced inflow of the international expertise needed to develop the high-speed, high-turnover logistic systems expected of a major player on world markets, and inflated risk margins as traders are forced to assume that whatever can go wrong probably will.

The justification that policy makers provide for intervention on grain markets often refers to the need to protect consumers from excessive prices and the need



to curb rapacious traders who would otherwise export “too much”, forcing Ukraine to import later in the marketing year. Even if these justifications are taken at face value (despite evidence that they are largely covers for rent seeking), the chosen policy response is highly inefficient. Lowering grain prices for all does not target assistance to consumers who are truly in need. Transparency and market information systems that eliminate information asymmetries are the best way to eliminate inefficient trade that destabilises domestic markets. The lack of functioning market information systems has an influence that extends beyond grain markets, however. Information asymmetries put producers at a disadvantage and limit their marketing options, lowering farm-gate prices and hence creating disincentives for investments in production. Information asymmetries can also lead to problems of adverse selection and “hold up” in the marketing chain, reducing incentives to invest in the production of the quality required to penetrate international markets. This is especially true where production is more fragmented and quality is complex and difficult to produce, i.e. for many livestock, fruit and vegetable products in Ukraine.

Agricultural competitiveness in Ukraine also suffers from inadequate systems to test and document food product quality and food safety. Effective food control systems are needed to protect (objective risk reduction) and reassure (subjective risk reduction) domestic consumers. They are also a necessary condition for successful participation on international agricultural markets. Domestic producers and consumers expect protection from importable threats such as avian flu and BSE, and potential buyers of Ukrainian products in the rest of the world expect documented conformity with international and sometimes additional national food safety and quality standards.

Without improvements towards an efficient and internationally recognised food quality and safety control system, Ukrainian agriculture will find it increasingly difficult to sell into international markets and its products will not be able to command top prices. The ban on Ukrainian meat, eggs, fish, cheese, milk and butter imposed by Russia in mid-January, 2006 provides an example of the disruptions that can result.⁴ This negative impact on competitiveness will be increasingly acute for more perishable products, higher-processed products and products that combine different agricultural raw materials — in other words many products with a higher degree of value added. The prospects for world trade in bulk agricultural commodities are good, but by focusing on exports of these products Ukraine would forego opportunities to generate additional value added and diversify the structure of the economy and employment in rural regions.

⁴ It has been suggested, however, that the Russian ban was at least in part politically motivated. To the extent that this is true, the example of the Russia ban underscores the importance of developing an internationally recognised food quality and safety control system as part of a strategy of export diversification to reduce Ukraine's current dependence especially on the Russian market for many of its dairy and meat products (see trade data in next sections).



Policy makers in Ukraine have also failed so far to establish a complete set of land markets and conditions for the enforcement of bankruptcy proceedings in agriculture. Agricultural land lease has been possible since late 1998, and an active land lease market has developed in Ukraine in the interim.⁵ However, a moratorium on the sale and purchase of land has been renewed twice, most recently in December 2006 through to the end of 2007. Much anecdotal evidence suggests that farm land is being “bought” and “sold” despite the moratorium, via a variety of shady arrangements that will be formalised whenever the moratorium is finally lifted.

Land lease is a sufficient condition for land to “move” from less to more efficient managers. However, a transparent, formal market for land sale is an integral element of the development of rural finance markets. Hence, the lack of a market for the sale and purchase of farm land has contributed to the underdevelopment of agricultural credit markets in Ukraine (Striewe et al., 2001). The ongoing moratorium on the enforcement of bankruptcy proceedings in agriculture has a similar impact on the development of agricultural finance. It also hinders the movement of scarce agricultural assets from less to more efficient farm managers by allowing the former to continue operations longer than would otherwise be the case.

By limiting the development of agricultural credit markets, missing markets for land purchase and sale and the lack of bankruptcy enforcement have reduced especially medium- and long-term investments for example in farm machinery, on-farm storage, cooling (milk) and drying (grain) equipment, etc. Missing or outdated machinery and equipment in crop production results in sub-optimal input application (e.g. seeding density and depth, the timing and precision of fertiliser and agro-chemical applications, incorporation of crop residues and use of moisture-saving no- or low-till technologies), higher costs of production and lower yields, and greater harvest and post-harvest losses (volume and quality). In livestock production it results in sub-optimal feed preparation and storage (e.g. silage quality), animal health problems (e.g. respiratory diseases due to poor climate in barns) and an inability to invest in superior genetic material. Outdated milking equipment can also lead to animal health problems and lower the quality of the milk produced, especially in conjunction with inadequate cooling facilities. At the intersection of animal and crop production, missing investments mean that very few farms are able to make the best possible use of manure to fertilise crops, ameliorate soils and avoid the environmental problems associated with inadequate manure disposal.

Underlying and accentuating all the barriers to competitiveness listed above is a

⁵ IER (2006b, Table 2) provides detailed information on the agricultural land lease market in Ukraine as of January 1, 2006. 88% of the agricultural land in Ukraine is leased, and the average annual payment amounts to roughly 115 Hryvnia/ha, of which 80% is paid in kind.

glaring shortage of human capital. Farm managers in Ukraine often continue to adhere to agronomic practices that are far from optimal. The result is low productivity and low quality output, waste and environmental damage. When asked, farm managers generally claim that a lack of capital for investments in modern technology is their biggest problem. However, these same managers rarely make the best possible use of the — admittedly scarce — capital that is at their disposal. Lischka (2004, p. 117).

Poor management also contributes to a lack of capital, because creditors will be much less eager to lend money to a farm that has consistently underperformed and is manifestly poorly managed. But the shortage of human capital does not only detract from competitiveness at the farm level. Producers and agri-food businesses lack knowledge of markets and marketing, including quality requirements in target markets and how to work towards fulfilling these requirements on the farm and in the food chain. And public institutions, such as the ministries responsible for identifying policy needs and formulating and implementing responses, suffer from a lack of the necessary analytical capacity and in particular the ability to distinguish between private and social costs and benefits.

The root of this shortage of human capital is an outdated and closed agri-food education and research establishment. A striking indicator of the degree to which Ukraine is isolated from international exchange and impulses in agricultural research and education is its almost complete lack of international presence in agricultural economics. The International Association of Agricultural Economists (IAAE) has over 1000 members from all over the world; however only one member from Ukraine is registered for the current 2005—2007 membership period. At the recent 2006 triennial IAAE conference in Brisbane, Australia, over 800 agricultural economists gathered for one week to present, discuss and debate, but not a single member from Ukraine (with the exception of a few young Ukrainians pursuing PhD studies in the EU and North America) was present. Young Ukrainians who complete PhDs abroad have very few options to return home to teach and establish research programs; the difficulties begin with the fact that their foreign PhDs are not recognised in Ukraine. Within the agricultural education system in Ukraine, corruption is rampant, with admissions, grades and degrees often being purchased rather than earned (Schoreit, 2004).

These are all indications that the sizeable agricultural research and education establishment in Ukraine is unwilling or unable to open up and serve as a conduit for new ideas and methods. In the years since Independence, the system has demonstrated that it is monolithic and hierarchical — with advancement more a function of loyalty and seniority than scientific creativity and output — and quite resistant to change. It fails to produce the trained young individuals that Ukrainian agriculture requires, and it fails to serve as an independent voice that

informs policy makers and other stakeholders by subjecting policy proposals and developments in the sector to objective and public scrutiny.

Measures to increase Ukraine's agricultural competitiveness

All of the barriers to competitiveness listed above are man-made, and all can be reduced or eliminated given political leadership and the will to set new priorities and break with past patterns of misallocation and neglect. The following list mirrors the discussion of barriers to competitiveness.

WTO membership should be finalised as soon as possible. This will ensure that Ukraine benefits from Most Favoured Nation status in its trade with other WTO members and access to the Dispute Settlement Mechanism in the event of conflict. It will also impose disciplines on Ukraine's agricultural policy, reducing distortions and intervention on agricultural markets. If the will to attain WTO membership is lacking, it is questionable whether Ukraine is fundamentally committed to fully realising its competitive potential in agriculture in the first place.

A durable solution must be found for the export VAT refund problem. Outstanding refunds must be repaid and an accountable and transparent mechanism put in place to ensure that there is no further accumulation of unpaid refunds. Failure to do so will subject agricultural exporters to unjustified costs and risks, which will be passed on to farmers in the form of lower farm gate prices.

Import procedures must be streamlined and discretionary application by customs officials curbed. Anything that makes imports such as seed, agricultural machinery or agri-chemicals more expensive reduces Ukraine's agricultural competitiveness. Recognition of EU product safety standards and certification would eliminate a great deal of delay and cost at Ukraine's borders.

Further steps to separate social sphere from farms are required. Local budgets must receive sufficient funding to allow local authorities to assume responsibility for social services, health care, infrastructure maintenance and schooling. Failure to proceed in this direction would perpetuate an excess burden on farms in Ukraine, binding time and resources that should be directed towards core tasks in farming.

Intervention on individual agricultural markets should be reduced. Measures such as the oilseed export tax and the grain export quota, which tax Ukraine's most competitive agricultural products, should be eliminated. The subsidisation of sugar beet production, each ton of which makes Ukraine poorer, should be phased out. Subsidies to livestock producers in the form of VAT expenditures are poorly targeted and distort incentives and should be eliminated. The result would

be a more balanced treatment of agriculture instead of the current taxation of more and subsidisation of less competitive products.

There is a great need to continue upgrading local storage facilities and inland transportation infrastructure for agricultural products. Modernisation and the introduction of competition in the rail system is an important aspect of this task, as is continuing to upgrade roads and developing the Dnipro as a major waterway for transporting bulk commodities. The state-owned Khib Ukrainy, which continues to own (and mis-manage) choice grain marketing assets (elevators, terminals), should be privatised. This will reduce marketing margins and increase farm gate prices. If farmers in Ukraine would receive roughly the same share of fob grain prices as their counterparts in Germany, the 2006 harvest of roughly 35 million tons would have resulted in an additional 1 billion US\$ of farm revenue, equivalent to about one-half of total government spending in support of agriculture in that year.

Ukraine should harmonise its domestic legislation with EC food and feed law, codex alimentarius standards and WTO SPS standards. It should seek bilateral and multilateral assistance to upgrade its food safety and quality assurance systems, strengthening certification mechanisms and institutions for quality assurance and accreditation, establishing reference laboratories, and implementing GAP- and HACCP-compliant production and processing. Failure to address these steps will lock Ukraine into the low-quality, bulk commodities segment of international agricultural trade and delay its expansion into higher-priced value added segments, thus reducing export prices and opportunities for diversification of rural economies and employment.

Ukraine needs to invest in developing modern agricultural market information systems. If more timely and objective market information were available, the case for many episodes of damaging state intervention on agricultural markets (the 2006 grain export quotas being a recent case in point) would be greatly weakened. Improved market information would improve the marketing options open to producers and reduce the problems associated with information asymmetries such as hold-up problems that can discourage investments in the production of quality.

Agricultural credit markets need to be developed beyond their current rudimentary status. Many of the steps above, by improving the competitiveness and earnings of Ukrainian agriculture, will boost the demand for credit. Legalising the purchase and sale of agricultural land and allowing creditors to enforce bankruptcy would encourage the supply. In the medium term, the government's partial subsidisation of interest on credits to agriculture is a comparatively efficient measure, provided that these credits and the interest rate subsidies are otherwise granted on impartial, commercial terms.

Much more effort must go into revitalising Ukraine's moribund agricultural research and education system and creating an alternative to the existing hierarchies that stifle debate, and block the inflow of new ideas and the retention of high-potential individuals in the country. Internationally recognised accreditation procedures for Universities (e.g. under the auspices of the EU's "Bologna Process") should be used to expose inadequacies and establish standards. Mandatory retirement and early retirement schemes for older colleagues and the use of external, international hiring committees would create more opportunities for merit-based advancement and incentives for highly trained young Ukrainians to return home. If old institutions (the leading Universities and the Academy of Science) resist reforms, then thought should be given to the establishment of new parallel institutions that would compete with the old on the basis of output and performance. These steps are desperately needed to ensure that Ukraine produces the highly trained individuals needed to run a modern agri-food sector.

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Appendix

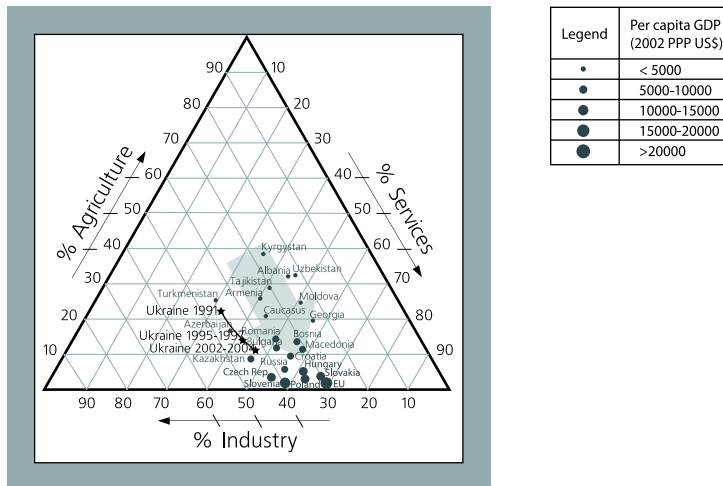


Figure A 1.1.
The sectoral composition of the economy in the European Union and Former Soviet Union countries (2002)

Source: Own calculations with World Bank (World Development Indicators, various issues).

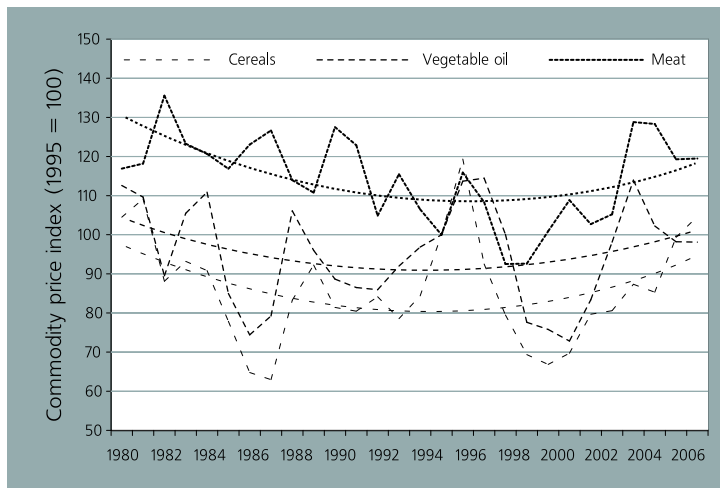


Figure A 1.2.
IMF agricultural commodity price indices and corresponding quadratic trends, 1980—2007 (1995 = 100)

Source: IMF (2006a) and own calculations.

Note: Cereals includes wheat, maize, rice and barley. Vegetable oil includes soybean, soybean meal, soybean oil, coconut oil, palm oil, sunflower oil, olive oil, fishmeal and groundnut. Meat includes beef, lamb, pork and poultry. See IMF (2006a) for exact definitions of the component prices and methodology.

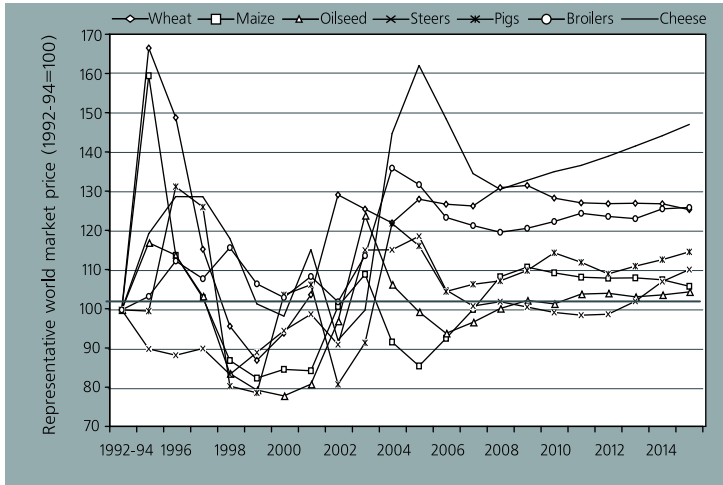


Figure A 1.3
 Representative world market prices for major agricultural commodities, 1992—2006 and projections through 2015 (1992—94 = 100)

Source: OECD and FAO (2006) and own calculations.

Note: Wheat (US HRW fob Gulf); Maize (US Nr.2 yellow fob Gulf); Oilseed (weighted average European port); Steers (market price Nebraska); Slaughter pigs (Iowa/S. Minn.); Broilers (wholesale 12 city average USA); Cheese (Northern Europe). For exact definitions of the products (quality and location) underlying these prices, see OECD and FAO (2006).

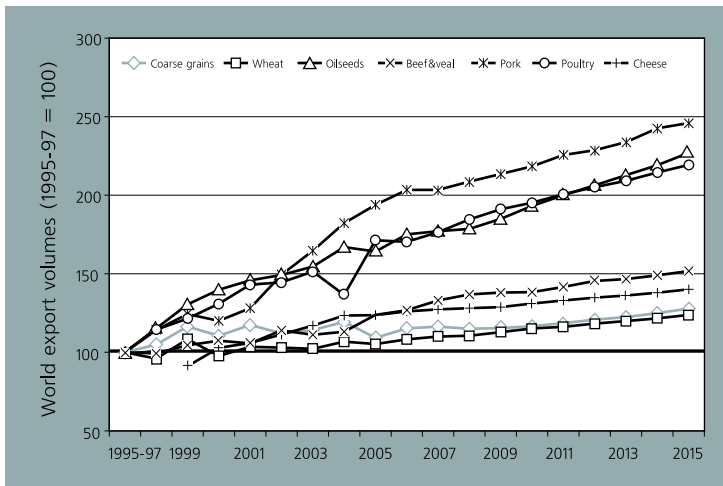


Figure A 1.4
 International export volumes for major agricultural commodities, 1992—2006 and projections through 2015 (1995—97 = 100)

Source: OECD and FAO (2006) and own calculations.

Note: For definitions of the product aggregates underlying these export volumes, see OECD and FAO (2006). For cheese the base period (= 100) is 1999—2001.



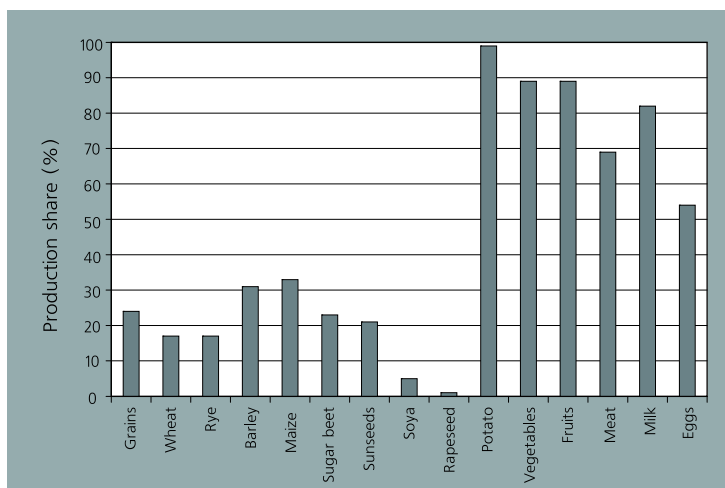


Figure A 1.5
The share of households in total production of selected agricultural products, 2004 (%)
 Source: State Statistics Committee of Ukraine.

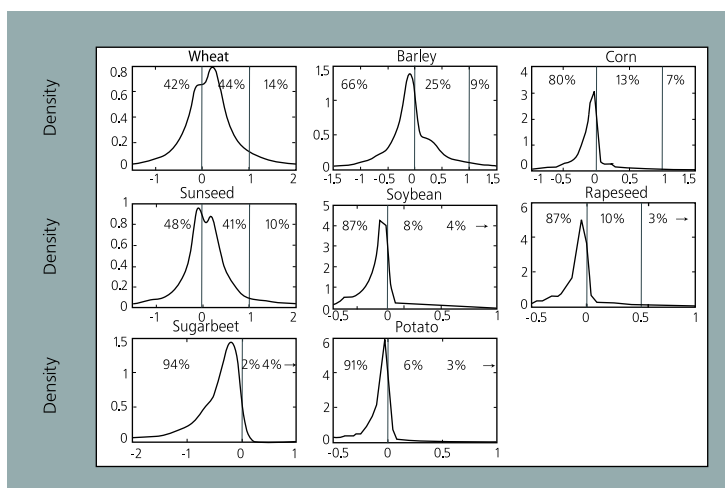


Figure A 1.6
Domestic resource cost (DRC) distributions for major crop products in Ukraine, 2005
 Source: Own calculations.



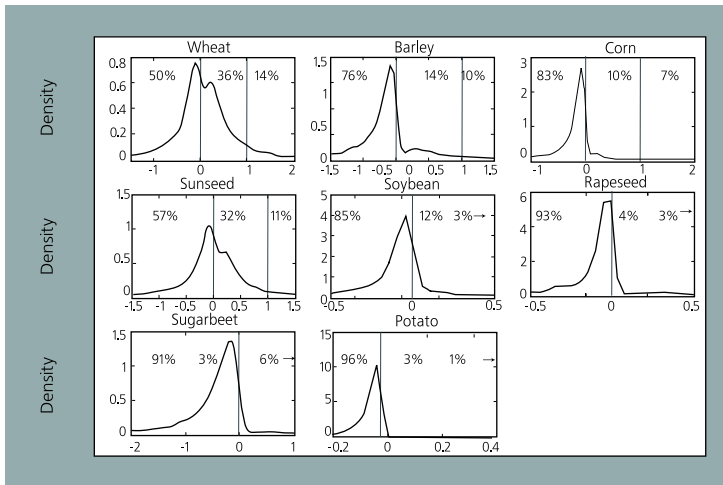


Figure A 1.7
 Domestic resource cost (DRC) distributions for major crop products in Ukraine, 2004
 Source: Own calculations.

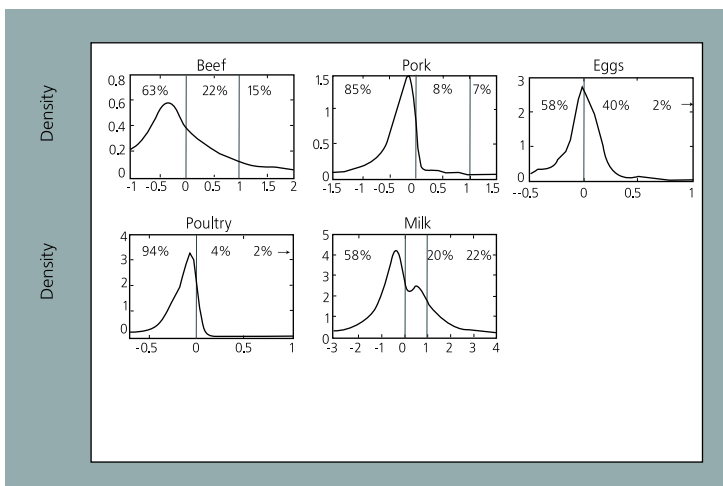


Figure A 1.8
 Domestic resource cost (DRC) distributions for major livestock products in Ukraine, 2005
 Source: Own calculations.

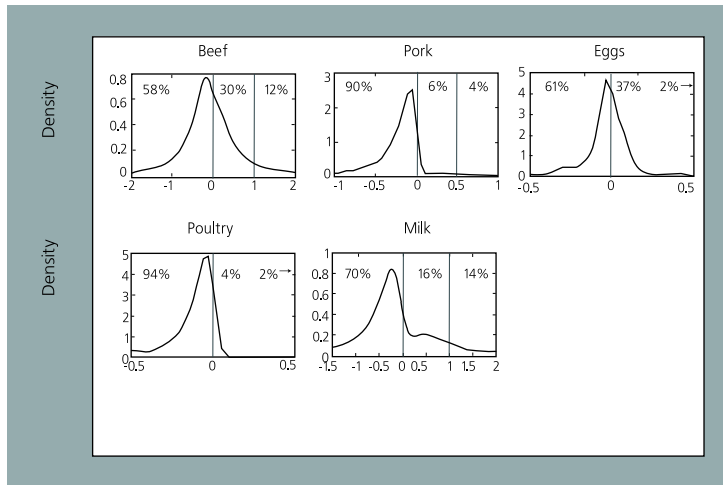


Figure A 1.9
 Domestic resource cost (DRC) distributions for major livestock products in Ukraine, 2004
 Source: Own calculations.

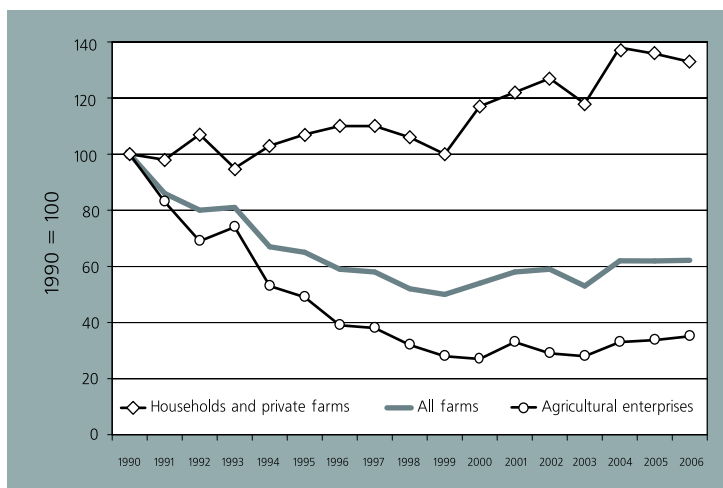


Figure A 1.10
 Development of gross agricultural output in Ukraine by type of farm, 1990–2006 (1990 = 100)
 Source: State Statistics Committee of Ukraine.

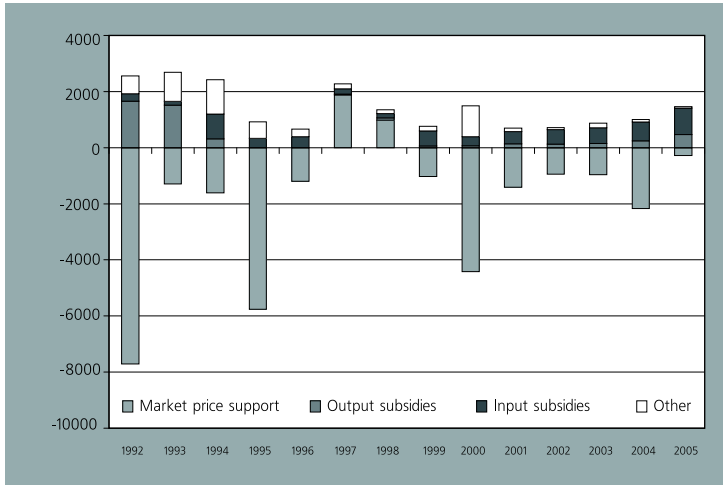


Figure A 1.11
The composition of producer support in Ukrainian agriculture, 1992—2005 (million US dollars)
 Source: von Cramon-Taubadel et al. (2006).

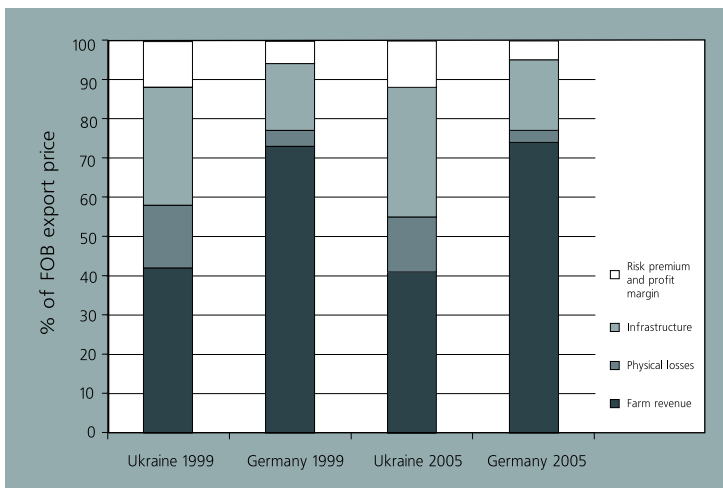


Figure A 1.12
Grain marketing costs in Ukraine and Germany, 1999 and 2005
 Source: von Cramon-Taubadel (2005)



2. Policy-induced Distortions to the Incentives Facing Agricultural Producers in Ukraine

This chapter reflects work from 2007 requested by the World Bank.⁶ The aim of this chapter is threefold: i) to provide an overview of the recent evolution of agriculture and agricultural policies in Ukraine; ii) to quantify the resulting distortions to agricultural incentives; and iii) to discuss the political economy of past agricultural policy choices with a view to sketching the probable future course of agricultural policy in the country. The methodology outlined in Anderson et al. (2006) is used to quantify the extent of direct and indirect distortions faced by domestic producers and consumers of agricultural products between 1992 and 2005. The main indicator of distortions employed in the paper is the Nominal Rate of Assistance to farm production (NRA). The analysis showed that nominal rates of assistance for agricultural products tended to be negative between 1992 and 2005, although there is considerable variation across products and time.

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⁶ This chapter is based on a lengthier country study prepared for a World Bank research project on Distortions to Agricultural Incentives, under the leadership of Kym Anderson of the World Bank's Development Research Group. The original country study can be accessed under www.worldbank.org/agdistortions. We thank, without implicating, the World Bank, Kym Anderson, Jo Swinnen and other participants in the Distortions project for assistance and valuable suggestions.



The extent of distortions to incentives in agriculture since Independence

Methods and data

We use the methodology outlined in Anderson et al. (2006) to quantify the extent of direct and indirect distortions faced by domestic producers and consumers of agricultural products between 1992 and 2005. The main indicator of distortions that we employ is the nominal rate of assistance to farm production (NRA), which is defined as the unit value of production at distorted prices and considering the impact of production subsidies less its value at undistorted free market prices expressed as a fraction of the undistorted price.⁷ For detailed information on this methodology and the estimates of NRAs and other estimates of distortions to incentives that it generates, refer to Anderson et al. (2006).

An important point of departure for our analysis are the OECD's PSE tables for Ukraine and the data on domestic and border prices, marketing margins and fiscal support for agriculture that they contain (OECD, 2006). We have checked the data and assumptions in the OECD tables and have found, with very few exceptions, that they are accurate and plausible. Where we have found discrepancies, discussions with OECD experts have invariably shown that these are due to open questions of interpretation.⁸

We have made several modifications to the OECD data. First, we have updated the estimates of fiscal support to agriculture since 2000. Second, we account for the fact that Ukraine was a net importer of wheat in 2000 and 2003. The OECD uses fob border prices for wheat in these years, although producers were receiving the equivalent of import parity prices (distorted by import tariffs and inflated marketing margins, see Figure A 2.6). As a result, we suspect that the OECD overestimates support for wheat in these years. Third, we have updated the OECD tables to include 2004 and 2005. Finally, we have attempted to include potatoes in our calculations. Potatoes are produced almost exclusively on household plots, and are not subject to significant direct policy intervention. However, they represent an important staple food in Ukraine and an important source of income for many rural households. Potatoes are grown on roughly 1.5 to 1.6 mha in Ukraine (approximately 5% of the country's arable land), and production has averaged some 17.7 mmt per year since 1992 (Table A 2.1). However, as potatoes are not widely traded and qualities vary widely, finding suitable border prices is difficult and the results must be interpreted with caution.

The volumes of *fiscal support* spending that we use (see Table A 2.2) are larger

⁷ Hence, $NRA = (\text{distorted value of production} - \text{undistorted value}) / (\text{undistorted value})$.

⁸ We are extremely grateful to Olga Melyukhina of the OECD for her expert and patient assistance.



than those recently produced by the World Bank (Zorya, 2006), because we consider not only spending by the Ministry of Agriculture but also spending by other ministries that benefits agriculture. We do not include spending by regional authorities, but this is probably not an important omission in Ukraine where regional authorities have limited fiscal resources. The treatment of different types of tax expenditures is an important issue. Unlike Zorya (2006), we include estimated benefits from the Fixed Agricultural Tax (FAT) in our estimates of tax expenditures.

Regarding *border prices*, inflated marketing costs in Ukraine increase import parity prices and depress export parity prices. For most grains and oilseeds in most years, Ukraine has been in a net export position, and inflated marketing costs have been passed on to farmers in the form of depressed farm gate prices. Inflated marketing costs have also increased price volatility for wheat which has alternated between net export and net import positions in recent years (see Figure A 2.5). It is debatable, however, whether inflated marketing costs should be considered a distortion. To the extent that they are due to inflated risk premiums charged by traders who are worried (justifiably) that they may be subject to harassment by policy makers (e.g. regional bans on the movement of grain, difficulties in securing export VAT refunds, or recent grain export quotas), these inflated costs are clearly policy distortions that could be eliminated at a stroke. However, a portion of these inflated marketing costs is due to outdated and inefficient infrastructure (transportation, poor port facilities, etc.) — a “systemic legacy” of the Soviet period (Liefert et al., 1996). This infrastructure would be in much better condition today if policy makers had created a better investment climate and not insisted in propping up inefficient state and parastatal marketing monopolies in the years since Independence (Harley, 1996). Hence, part of the “legacy” effect might reasonably be considered a distortion. However, determining which part would require an appropriate counterfactual (how low would marketing costs be if policy had not distorted in the past).

Regarding *domestic prices*, we are concerned that the producer prices reported in official Ukrainian statistics could be biased. The authorities might inflate these prices in an attempt to paint a better picture of the situation in agriculture for political reasons; they might also attempt to correct for suspected under-reporting by farm managers in order to improve tax collection. We have compared official producer prices with detailed sets of prices reported by a large sample of individual farms (over 5000 observations), and found that official prices typically over-estimate. A case in point is wheat prices in 2003. According to official statistics, the average producer price for wheat was 635 UAH/t in 2003. However, the average of the individual producer prices in our sample is 605 UAH/t. If this is a systematic problem, the estimates presented below will tend to overestimate the support provided to farmers in Ukraine.

In addition, note that aggregate measures will average away what might be significant differences in the support and distortions felt by individual farmers. Borodina (2006) shows that almost 75% of the production subsidies provided to livestock producers in Ukraine in 2004 accrued to only 7.2% of the livestock producing agricultural enterprises. Nivjevskiy and von Cramon-Taubadel (2007, p. 6) demonstrate that in 2005, 14.7% of the dairy farms in Ukraine accounting for 56.2% of the country's milk production received 64.7% of the subsidies provided to milk producers. Moreover, different types of producer receive different average prices for agricultural commodities. For example, according to official statistics, large farm enterprises received on average 535 UAH/t for grains, 140 UAH/t for sugar beet and 3481 UAH/t for beef in 2003; corresponding prices for household plots were 495, 157 and 2394 UAH/t. Finally, there are significant differences in prices received by farmers in different regions. For example, according to official data, average producer prices for grain varied from as low as 330 UAH/t in Eastern and Southern oblasts to over 480 UAH/t in Northern and Western oblasts in each of the 2001/02 and 2002/03 marketing years.

Finally, we make no attempt to account for exchange rate. In a thorough analysis of real exchange rate distortions in Ukraine between 1996 and 2001, Zorya (2003) estimated that the real exchange rate of the Hryvna was overvalued by 15–20% in 1996–98, until devaluation triggered by the financial crisis in late 1998 effected a major correction. The resulting taxation of tradable goods production represents a significant distortion of agricultural incentives that must be kept in mind when considering the results presented below.

In summary, it bears repeating that much data on agriculture in Ukraine is of dubious quality; especially data from the early years of transition when exchange rates and inflation were very volatile (see Table A 2.1). Estimates of support produced using this data must therefore be interpreted with caution. While we are confident that the estimates reported below capture key trends and patterns, it would be dangerous to depend heavily on year to year point estimates.

Results

Estimates of the NRAs for agriculture and non-agriculture from 1992 to 2005 are presented in Tables A 2.2 and A 2.3, and the corresponding Figures A 2.2 and A 2.3 present NRAs for major agricultural and non-agricultural aggregates. Again, estimates of support in the early 1990s must be treated with special caution as hyperinflation in these years makes price and exchange rates difficult to grasp and compare.

Nominal rates of assistance for agricultural products tended between 1992 and 2005, although there is considerable variation across products and time. After the collapse of the Soviet system in the early 1990s, Ukraine's NRA to agricultural

producers fell to almost —50% in 1992. It fluctuated about an increasing trend through the 1990s before settling at roughly —10 to —15% in the first years of the new century. Fiscal support has risen in recent years, and a positive NRA, the first since 1998, was recorded in 2005.

Comparing products, exported agricultural products tend to be taxed, while imports tend to receive support. Important exceptions to the latter pattern can be observed in 2000 and 2003, when importables were taxed as well. This can largely be attributed to the impact of net import situations for wheat in those years which led to various measures to depress wheat prices and, by extension, bread prices, which are politically highly sensitive in Ukraine. Overall, since export products play a considerably larger role in Ukrainian agricultural production than import products, the net taxation of exports dominates and the weighted average NRA for agriculture is negative.

Fluctuations in NRAs over time can be attributed to a number of sources besides measurement error and “noise”. One, to be discussed below, is policy, which has been highly variable. Another is the unstable macroeconomic environment within which Ukrainian agriculture has operated. Hyperinflation in 1993—94, for example, meant that farms could repay budget loans received early in the year to finance seeding at extremely low rates at the end of the year; for all intents and purposes the loans were grants. The positive support indicated for 1997 and 1998 in our calculations would likely disappear if the impact of real exchange rate overvaluation was considered. Fluctuations in production — e.g. the poor grain harvests in 2000 and 2003 mentioned above — are a further source of instability.

Figure A 2.4 breaks down aggregate support for agricultural producers in Ukraine between 1992 and 2005 into the components “market price support”, “input subsidies”, “output subsidies”, and “other” based on OECD PSE calculations of support in million US\$. Since the underlying data are very similar, net support in Figure A 2.5 follows the same 1992—2005 trend as the aggregate NRAs for agriculture in Figures A 2.2 and A 2.3. Market price support has been negative in most years, and other forms of support have generally not been sufficient to compensate. The reduction in input and output subsidies and other transfers in the early 1990s are clearly visible, as is the recent re-emergence of budget support in the form of output and input subsidies. The high value of “other subsidies” reported for 2000 results primarily from significant debt write-offs that occurred in this year. Market price support has fluctuated considerably, reflecting instable policies, fluctuations in world market prices that are not being transmitted fully onto domestic markets, and terms of trade effects as Ukraine has alternated between net import to net export positions for key agricultural commodities such as wheat. The general trend towards more support for agriculture since eco-

conomic (and agricultural) growth resumed in 2000 is confirmed, as input (mainly credit) and output subsidies have increased steadily. Data for 2006 and 2007, which is not yet available, would presumably reveal a jump in negative market price support due to the impact of grain export quotas (discussed below), and a further increase in various forms of fiscal support.

The evolution since 1992 of policies and distortions affecting agricultural incentives

We maintain that four main phases of agricultural policy in Ukraine since Independence can be identified. These phases divide the years since Independence into the following periods: 1991 to 1994; 1995 to 1998; 1999—2000; and 2001 to date.

Phase I: 1991—1994

In the years between Independence and 1994, few market reforms were undertaken. Most key elements of the Soviet system (state procurement of key agricultural products, state provision of inputs, administrative control of product flows, prices and margins) were maintained. In 1992, the kolkhozes and sovkhozes were transformed into so-called collective agricultural enterprises (CAEs). This largely formal change led to little real restructuring in the farm sector. Input supply and food processing remained firmly in state hands. In 1991, a law made private farming possible. By 1994, 32,000 private farms had emerged. This number increased to roughly 43,000 by 2002. However, the private farms remained small (with an average size of under 30 ha in the 1990s, increasing to 66 ha in 2002), and have proven much less potent as a force shaping agricultural policy than the roughly 12,000 CAEs and their successor enterprises.

In the “Gold Rush” years following Independence, some individuals and enterprises made very large profits by purchasing agricultural products such as grain and livestock at very low prices, and selling them on world markets for considerably more. According to Åslund (1999), in 1992 roughly 40% of Ukraine's exports were composed of commodities, the prices of which were, due to the ongoing regulation of domestic markets, on average roughly 10% of corresponding world market prices. Hence, rents of roughly 4.1 bUS\$, or 20% of Ukrainian GDP in 1992 accrued to a handful of individuals who had access to goods and export opportunities. Policy makers responded with a flurry of administrative measures designed to stem such exports (or redirect the proceeds) including, in 1993, export quotas and licensing. Significant rents were also distributed in the form of budget subsidies, including those to agriculture, and subsidised credits to enterprises. In 1993, when inflation exceeded 4,700%, state credits were granted at 20% rates of interest and, thus, essentially represented gifts to those who could quickly convert them in to currency or tradable commodities.

Altogether, policy followed a very conservative course in this first phase, largely maintaining Soviet-style ownership structures, budget transfers and state regulation of markets. Farms continued to receive Soviet-level support in the form of direct budget transfers, low interest loans that were often rolled over or forgiven, and subsidised inputs. This slow pace of reform was not unique to agriculture but rather common to all sectors. Furthermore, it was accompanied by (and as Zorya (2003) demonstrates, contributed to) misguided macroeconomic policies, in particular the use of the printing press to finance burgeoning fiscal deficits. Coupled with a collapse of inter-republican Soviet trade, the result was significant macroeconomic destabilisation as outlined in section 2 above.

As displayed in Figure A 2.1 and Table A 2.1, agricultural production and especially livestock production also declined dramatically in this first phase of agricultural development following Independence, albeit at a slower rate than production in the rest of the economy. The reduction of subsidies led to a rapid increase in input prices and a corresponding deterioration in agriculture's terms of trade. As a result, input use and yields fell dramatically; between 1990 and 1996, mineral fertiliser applications fell from an average of 102.5 to 12.5 kg nitrogen equivalent/hectare, while average grain yields fell from 3.2 t/ha in 1988/90 to 2.3 t/ha in 1994/96 (Spaar & Schuhmann, 2000, p. 258—9; see also World Bank & OECD, 2004, p. 5). As the economy imploded, agriculture absorbed labour shed by contracting industrial production, and subsistence production of food on household plots became the only feasible survival strategy for many Ukrainians. Household production therefore remained more or less constant through 1994.

Phase II: 1995—1998

Following Leonid Kuchma's first election as President in late 1994, several promising reforms were implemented. These were mainly directed at achieving macroeconomic stabilisation by reducing fiscal deficits and their financing via monetary expansion. As a result of these efforts, budgetary transfers to agriculture in Ukraine contracted sharply after 1994, from as much as 11% to roughly 2% of GDP (Table A 2.2). A number of policy reforms specific to agriculture were also undertaken early in this phase; in late 1994, a legal basis for the distribution of land shares to CAE members was created, and by 1996 most quotas and licensing restrictions on agricultural exports had been eliminated.

Following this promising start, however, agricultural reforms lost momentum, and the years from 1996 to 1998 can accurately be described as wasted. The CAEs proved to be little more than the old kolkhozes and sovkhoses under new names. While members theoretically had rights to their individual land shares, they had few practical means of exercising these rights, as land sale and rental were forbidden and individual land parcels were not demarcated.

In the food processing industry, a privatisation mechanism that gave supplying farms and the state 51% and 25% shares, respectively, with the rest going to employees and open sales, was introduced in 1996. In so-called “strategic” areas (for example grain marketing), however, the state’s share was often larger, and key enterprises were often exempted from privatisation. As a result, much of the food processing and marketing sector remained monopolistic and inefficient. For key agricultural export products (e.g. grain and oilseeds), inefficient processing and marketing (i.e. transportation and storage) translated directly into depressed farm-gate prices. In 1999, it was estimated that inefficient grain marketing structures were leaving Ukrainian farmers with only roughly 40% of the f.o.b. export price, compared with 70% in the case of Germany (von Cramon-Taubadel, 2005).

In the area of trade policy, the elimination of quotas and licensing restrictions led to little effective liberalisation (von Cramon-Taubadel & Koester, 1998). Trade controls are valves that make it possible to channel trade flows and any associated rents. While export quotas and licences were eliminated to comply with IMF and World Bank conditionality in 1996, those who had benefited from these restrictions quickly developed alternatives. For example, so-called “indicative” and “recommended” prices (minimum export prices) were implemented for many products. Even if these were not officially binding, local customs officials could, depending on who was asking, insist on their application. To avoid costly delays, traders either had to “resolve” disputes locally with the customs officials in question, or they had to cultivate high-ranking contacts in Kiev which could “facilitate” transactions. Beginning with the 1996 harvest, some regional (oblast) authorities declared bans on grain exports, ostensibly to secure payment for inputs that had been delivered in the spring and for tax debts. While the regional authorities had no right to impose such bans, the response of the central government in Kiev was ambiguous; repeated statements that such bans were illegal were coupled with references to the need to keep the state reserves supplied and to collect taxes and debts. In each of the following three years (1997—99), regional export bans and confiscation of grain and oilseeds were employed in a similar manner.

Under these conditions, private input suppliers were unable to secure payment for their deliveries (foreign agricultural chemical firms had accumulated receivables of roughly 200 mUS\$ by late 1999), and private input supply stagnated at very low levels (World Bank & OECD, 2004, p. 5). Together with the government’s inability to supply the right inputs at the right time to the right farms, and the low farm-gate prices mentioned above, this caused a rapid decline in crop production in Ukraine in the second half of the 1990s. Livestock production also continued to contract, and by 1999 agricultural output had fallen to 50% of its pre-Independence level. Household production remained more or less constant, but production on the CAEs fell by more than 70% in the 1990s (Table A 2.1 and Figure A 2.1).⁹

Altogether, this second phase of agricultural policy developments was characterised by an imbalance between macroeconomic and sectoral reforms. While a semblance of macroeconomic stability was regained in the mid-1990s as inflation rates dropped and economic contraction decelerated (Table A 2.1), macroeconomic reforms were not supported by structural reforms in agriculture and other sectors. Hence, macroeconomic stability formed a thin crust over a rotten core. These imbalances culminated in a financial crisis in September 1998. This crisis was triggered by international developments (Southeast Asia, Russia, Latin America), but the extreme vulnerability of the Ukrainian economy was home-made and some correction was inevitable. The Hryvna devalued by roughly 45% vis-à-vis the US dollar between the third and fourth quarters of 1998, and by roughly 100% by the fourth quarter of 1999. This provided agriculture with an important impetus, setting the stage for the next phase in the evolution of agricultural policy in Ukraine.

Phase III: 1999—2000

The third phase in independent Ukrainian agricultural policy was brief but crucial. In the aftermath of the 1998 financial crisis and following his re-election in late 1999, President Kuchma recognised the need to speed up the reform process, including in agriculture. On December 3, 1999 he signed a Presidential Decree (No. 1529/99 “On Urgent Measures for Accelerating Reformation of the Agrarian Sector of the Economy”) that stipulated that all CAEs distribute land shares and restructure to form new entities by no later than April 30, 2000. He entrusted Victor Yushchenko, a reform-oriented former Chairman of the National Bank of Ukraine, with the formation of a new government. One of Prime Minister Yushchenko’s first measures was the January 17, 2000 Cabinet of Ministers Resolution “On New Approaches to Supply Inputs to Farms” which stipulated that the government would henceforth supply inputs to farms only on a cash payment basis and which essentially put an end to the state order for grain and other agricultural products.

In March 2000 a further law wrote off the debts of farm enterprises that had fulfilled the terms of Decree No. 1529/99. Most former CAEs had done so, and in the process the number of collective farms fell as they adopted new legal forms, primarily partnerships and cooperatives. The distribution of land shares stipulated in Decree No. 1529/99 shifted the ownership structure of agricultural land in Ukraine in favour of private owners. By January 2002, only 4% of the arable land in the country remained in state hands; roughly 30% was privately owned and used by rural residents (private farms and household plots), and over 65% was owned by the members of the former CAEs.¹⁰ Altogether, almost 7 million

⁹ Note that statistics on agricultural production by CAEs and household plots are biased in favor of the latter, as much household production is based on inputs provided by CAEs.

Ukrainians became owners of land, with average land shares of 4.2 hectares. Accompanying measures to promote the development of a rental market for agricultural land (land rent had been formally legalised by a law passed in October 1998) led to the emergence of a rental market, providing land owners with a new source of income.

Finally, in July 2000, a new Land Code that abolished collective land ownership and provided for sale of agricultural land and its use as collateral passed first reading in the Ukrainian Parliament (Rada). Although the Land Code was not finally adopted by the Rada until October 2001, its consideration was a further indication that Ukraine's agricultural policy makers were finally addressing important market-oriented reforms.

Together, these decisions generated considerable optimism in Ukrainian agriculture, and in 2000 much more capital flowed into farming than in earlier years. In 2000 and 2001, for the first time since 1995, Ukraine's agricultural enterprises generated an aggregate profit (World Bank & OECD, 2004, p. 90). Agricultural output increased in these years, for the first time since Independence (Figure A 2.1 and Table A 2.4). As Table A 2.4 demonstrates, the food processing industry also began to grow at this time. In both agriculture and food processing, employment began to fall and wages began to increase. The development of food processing — supported by significant inflows of foreign direct investment and with exports doubling in 5 years — is especially impressive. While it is difficult to distinguish between the contributions of the post-financial crisis exchange rate devaluation on the one hand, and reform measures on the other, it is clear that the latter contributed significantly to the turning point in Ukraine's post-Independence agricultural development at the beginning of the new Millennium (Åslund, 2001).

Phase IV: 2001—today

The third phase of key reforms was short-lived and gave way to an ongoing fourth phase of stop-and-go reforms. Yushchenko's was replaced as Prime Minister after less than two years, and even as the reforms described above were being implemented, dirigistic measures were being introduced as well. These measures mainly represented attempts to regulate individual products markets such as those for grains, sugar and oilseeds. Decree No. 832 (June 2000) and Law No. 2238—14 (January 2001), for example, required the certification of grain exports, provided for mandatory crop insurance for grain producers, and enhanced the role of the state holding Klib Ukrainy (Bread of Ukraine), which had been founded in 1996 and continued to control a strategic chunk of Ukraine's grain marketing infrastructure (e.g. elevators at key locations, harbour facilities). These measures were taken against the background of a poor wheat harvest in

¹⁰ See World Bank & OECD (2004, chapter 6). For more information on farm restructuring and land market reforms in Ukraine see Lerman & Csaki (1999), Lerman, Csaki & Feder (2002) and Puhachov & Puhachova (2001).

2000, which led to a rapid jump in wheat prices from export parity to import parity levels. Due to the political sensitivity of wheat and bread prices, policy makers reverted to their planning ways and attempted to regulate prices and product flows (von Cramon-Taubadel, 2001). This pattern of market instability, dirigistic over-reaction and amplified instability was repeated following the very poor grain harvest in 2003, in response to increasing meat and sugar prices in 2005, and again on grain markets as world market prices increased in late 2006.

Other measures taken in or after 2001 included minimum prices for sugar, and a pledge price system for grains modelled along the lines of the US loan rate system (that has been underfunded and therefore largely ineffective so far). In September 1999, the decision had been taken to introduce a 23% tax on sunflower seed exports, and neither the reform government under Yushchenko nor later governments showed any intention of eliminating this tax. A July 2001 amendment did reduce this export tax from 23% to 17%, but it also closed loopholes that had provided exemptions, thus increasing the effective export tax burden (Kuhn & Nivyevskiy, 2004).

The Orange Revolution, which followed controversial presidential elections in late 2004, led to a change of government, but to no major changes in the stop-and-go, nature of agricultural policy since 2000. Victor Yushchenko, who had implemented key reforms in 1999/2000 (see above), emerged from the Revolution as President in early 2005. But the new government under Prime Minister Juliya Tymoshenko responded to price hikes on meat, sugar and gasoline markets in early-mid 2005 with price controls or threats thereof. And in the summer of 2005, her solution to the problem of inflated marketing costs for grain (and the resulting low export parity prices at the farm gate) was to regulate the prices that Khlib Ukrainy and other state agents pay for transport, processing and handling services, granting them privileges not shared by their commercial grain trading competitors. On the positive side, a number of steps towards Ukraine's WTO accession were taken in 2005. In particular, important changes in tariff schedules were introduced in mid-2005, reducing tariffs for non-sensitive food and agricultural products, unifying MFN and full tariff rates, increasing the uniformity of tariffs and dropping a number of mixed and specific tariffs.¹¹

Parliamentary elections in March 2006, followed by lengthy and controversial coalition negotiations, led in August 2006 to a new government under Viktor Janukovitch. Shortly thereafter, the new Minister of Agriculture announced the introduction of a new system of licenses for grain exporters. This system was

¹¹ According to estimates by the Ministry of Economy, the following reductions in average MFN rates were implemented: HS 01/05 — from 35 to 21.9%; HS 06/14 — from 31.7 to 19.7%; HS 15 — from 26 to 10.8%; and HS 16/24 — from 63 to 14.2%. However, these numbers clearly overestimate the actual tariff reduction because they only account for *ad valorem* tariffs or the *ad valorem* component of mixed tariffs, and exclude specific tariffs that typically produce the highest rates.

subsequently replaced with a quota system. The argument made to support these measures was that they were needed to guarantee food security and protect domestic consumers from rising international wheat prices, but many observers attributed them to rent seeking. The impact on international grain traders, who were suddenly unable to fill ships and orders, was catastrophic (von Cramon-Taubadel and Raiser, 2006). In retrospect, the period since the presidential elections and Orange Revolution in late 2004 has added up to almost 3 years of political turbulence during which policy makers have had little time and even less inclination to deal with fundamental reform issues in agriculture.

Explanations for the evolution of agricultural policy since Independence

Agricultural policy is driven by the political/ideological orientations of those who make it, by the institutional, administrative and analytical capacities available to them, and by the external constraints, domestic and international, that they face. In the following we review these factors.

The first President of Ukraine, Leonid Kravchuk, was a former Second Secretary of the Communist Party responsible for ideology. Under the Kravchuk administration, transforming what had been provincial institutions into national institutions in Kyiv (i.e. creating a National Bank etc.) received the highest priority. The new nation's leaders had little knowledge of how and why to implement economic reforms; their thinking was dominated by the perceived need to reduce political dependence on Russia. In the ensuing years, all of the trappings of an inflated bureaucracy and stifling regulation emerged. By 1996, Ukraine had approximately 70 Ministries and State Committees (Sundakov, 1996, p. 5). Combined with a lack of economic expertise and the fact that the old pre-Independence establishment (*nomenklatura*) in Ukraine had remained more or less intact, this created a very fertile environment for rent seeking.

Ministers of Agriculture in Ukraine have changed frequently since Independence, with 13 different Ministers serving over a period of 16 years. Furthermore, at various times, but not continuously, a Vice Prime Ministers specifically responsible for agricultural policy has served parallel to the Minister of Agriculture. Certain individuals have come and gone several times, rotating between different posts. The Presidential Administration has traditionally also included a senior advisor responsible for agricultural issues and under the old constitution up to January 1, 2006, the President was equipped with far-reaching powers to promulgate decrees. The result has been a multi-polar, fragmented and often competitive agricultural policy making system, with unclear and frequently contradictory delineation of responsibility, compounded by a lack of personal continuity.

Weak analytical and administrative capacities exacerbate this problem. Ministers and Vice-Prime Ministers responsible for Agriculture have tended to have production-oriented backgrounds (as tractorists, agronomists, etc.). Hence, they have had little appreciation of macroeconomic issues and general equilibrium linkages to the rest of the Ukrainian economy and world markets. A major deficit is that the system of agricultural education and research in Ukraine has remained in the hands of an old guard with a limited understanding of open-economy agricultural economics. Corruption in the education system is widespread, and there is much anecdotal evidence that many degrees are bought and sold rather than earned. Young agricultural economists who have gone abroad to receive an education have generally found that the academic and research community in Ukraine is not willing to provide them with opportunities commensurate with their abilities when they return. The result is a scarcity of capable analysts and incisive economic analysis to inform the policy making process.

This lack of analytical capacity and appreciation of what agricultural policy can and cannot achieve given domestic and international constraints has, until now, hindered the development of a clear vision of what key goals agricultural policy in Ukraine should pursue and what instruments are needed to pursue them. The fundamental tension that exists between farmers' interest in higher farm product prices on the one hand, and consumers' interest in inexpensive food on the other, has never been confronted squarely. Ministers have mainly engaged in fire-fighting, dealing with periodic crises on individual product markets as prices either fall or climb too much, and success still tends to be measured in tons of output.

A further theme is that of policy complacency. As illustrated in Tables A 2.1 and A 2.4, the overall trend in Ukrainian agriculture and food processing since 1999/2000 has been positive, as production, value added and exports have increased. Reforms have been slow and uneven, but they have sufficed to generate positive results. Indeed, it could be argued that Ukrainian agriculture has managed to succeed despite policy, thanks to Ukraine's natural comparative advantage, to a positive overall economic environment (stability and growth) over the last six years, and to the tenacity and resourcefulness of Ukraine's farmers. In this sense, Ukrainian agriculture suffers from the "curse" of natural resource wealth that has been documented elsewhere (e.g. Gylfason, 2002).

Corruption and rent-seeking have both benefited from and contributed to the maintenance of a disoriented policy. As described above, in the years following Independence a powerful class of rent seekers emerged. If there had been little reason to expect market-oriented agricultural reforms immediately following Independence, such reforms became even less likely as rent-seeking interests became entrenched in later years.¹² Rent seeking takes place at a national level, when oligarchs (many of whom are members of Parliament) manipulate the size

and distribution of tariff rate quotas to their own advantage. It also takes place at the local and individual farm level, when farm managers make side-deals with local authorities to deliver to local processing enterprises instead of higher-paying enterprises elsewhere, or when they under-invoice sales of produce to traders, pocketing the difference and reporting a loss to the tax authorities and their employees. The agricultural growth recorded in recent years has provided an enticing stream of proceeds to be divided and distributed. More ambitious reforms could transform this stream of proceeds into a torrent, but one that would wash away the elaborate system of channels and sluice gates maintained by today's beneficiaries.

Implications for future agricultural policy in Ukraine

There is little reason to expect major changes in the nature of the agricultural policy making process or of the actors involved in this process in the immediate future. The Orange Revolution has entrenched democracy in Ukraine; unlike several other CIS countries, Ukraine has a vibrant multi-party system and a lively media landscape. However, there is yet no recognisable new generation of market oriented, open economy agricultural policy makers and analysts waiting in the wings in Ukraine; the domestic agricultural education and research establishment is not producing such individuals and there is no procedure/niche for absorbing and reintegrating individuals with foreign training. It thus appears likely that agricultural policy will continue to be designed and implemented by individuals who take a dirigistic and partial or sectoral view.

Perhaps the most important factor disciplining agricultural policy makers in Ukraine in the future will be WTO membership. Ukraine first applied for membership in the WTO in 1994, but it was not until the early years of the new century that negotiations entered a serious phase and Ukraine began to take steps to adjust its domestic policies accordingly. Ukraine has reached agreement with almost all of the members of its working party, and the outlines of an accession deal for Ukraine have taken shape (Zorya, 2005).¹² In the area of *market access*, Ukraine will reduce its average tariffs in agriculture from roughly 30% to 13%. To protect its sugar regime, an import tariff of 50% will likely be maintained. The Ukrainian government is confident that this will provide a sufficient margin of protection for the domestic sugar industry, but other calculations suggest that if world market prices for sugar fall from their current highs back to the 200 \$/t range, imported sugar priced accordingly at roughly 300\$/t in Ukraine could undercut domestic Ukrainian production (Nivyeveskiy & Strubenhoff, 2006).

¹² For a discussion of this problem in transition economies, see EBRD (1999, p. 102–114). On rent seeking and trade in Ukraine, see also Havrylyshyn (1994).

¹³ For impact of WTO accession on the economy as a whole and sectors other than agriculture, see Burakovsky et al. (2004), Copenhagen Economics (2005), and Pavel et al. (2004).

In the area of **domestic support**, Ukraine appears to have secured an AMS allowance of 1.7 billion US dollars based on the 2004—06 period. Zorya (2005, p. 33) estimates that Ukraine used roughly 40% of an AMS allowance of 1.14 billion US\$ that was being discussed in 2005. This would leave some scope for expansion of support measures for agriculture in Ukraine, subject to fiscal constraints. Disciplines on the use of **export subsidies** will likely have the most important and binding implications for future agricultural policy in Ukraine. As Ukraine has made no use of export subsidies in the past, the likely outcome of its WTO accession negotiations is a bound ceiling of zero. This implies that Ukraine will not be in a position to engage in any form of price support for agricultural products that it exports.

Altogether, the most likely path for Ukrainian agriculture appears to be one of continued muddling through, with WTO membership and fiscal constraints disciplining policy makers to some extent, and Ukraine's agricultural potential, enterprising farmers and agribusiness entrepreneurs ensuring continued progress, albeit at a slower rate than could be attained with an appropriate policy mix. Of course, we would be very pleased to see this relatively pessimistic outlook proved wrong in the coming years.

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Appendix

Table A 2.1

Major economic indicators and production of major agricultural products in Ukraine, 1960—2005

	1960	1970	1971-75*	1976-80*	1981-85*	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Major economic indicators																						
Population (mln)	42.9	47.4	48.4	49.7	50.6	51.0	51.9	52.1	52.2	52.1	51.7	51.3	50.8	50.4	49.9	49.4	48.9	48.5	48.0	47.6	47.3	46.9
Rural population (mln)	22.8	21.5	20.9	19.7	18.5	18.0	16.9	16.8	16.7	16.6	16.5	16.4	16.3	16.2	16.1	16.0	15.9	15.7	15.5	15.3	15.1	
Nominal GDP (bnUS\$)	na	na	na	na	na	na	815	775	73.9	65.6	52.2	48.2	44.6	50.2	41.9	31.6	31.2	37.8	42.6	49.5	65.1	83.1
Real GDP growth (%)	na	na	na	na	na	na	-6.4	-8.4	-9.7	-14.2	-22.9	-12.2	-10.0	-3.0	-1.9	-0.4	6.0	9.2	5.2	9.6	12.1	2.6
PPP/capita GDP**	na	na	na	na	na	na	7.8	7.2	6.6	5.8	4.4	3.9	3.6	3.5	3.5	3.5	3.8	4.1	4.3	4.8	5.3	5.5
Inflation***	na	na	na	na	na	na	na	na	na	4735	8912	376.7	80.3	15.9	10.6	22.7	28.2	12.0	0.8	5.2	9.0	13.5
GDP shares (%): Agric.	na	na	na	na	na	na	25.2	22.7	20.2	21.5	16.2	14.5	11.8	11.8	11.9	11.7	14.4	14.4	13.0	10.9	10.8	10.8
Industry	na	na	na	na	na	na	na	na	na	na	na	30.9	29.4	24.7	25.2	26.5	26.6	26.1	27.4	27.2	28.3	29.6
Construction	na	na	na	na	na	na	na	na	na	na	na	7.3	5.5	5.4	4.8	4.1	3.6	3.6	3.4	3.9	4.3	3.9
Trade & transport	na	na	na	na	na	na	na	na	na	na	na	14.5	19.6	20.4	20.6	19.7	21.3	23.0	23.1	25.0	24.7	26.8
Other services	na	na	na	na	na	na	na	na	na	na	na	25.5	26.8	25.8	23.3	21.2	19.9	21.2	23.6	24.6	22.6	28.9
Crop products (million tons)																						
G-rains and pulses	21.8	36.4	40.0	43.1	39.3	37.5	51.0	38.7	38.5	45.6	35.5	33.9	24.6	35.5	26.5	24.6	24.4	39.7	38.8	20.2	41.8	38.0
of which:																						
Wheat	6.5	15.5	19.7	21.9	18.8	18.1	30.4	21.2	19.5	21.8	13.9	16.3	13.5	18.4	14.9	13.6	10.2	21.3	20.6	3.6	17.5	17.9
Corn	5.5	6.3	5.9	4.4	6.5	6.5	4.7	4.7	2.9	3.8	1.5	3.4	1.8	5.3	2.3	1.7	3.8	3.6	4.2	6.9	8.9	6.6
Rye	1.4	1.2	1.3	1.3	1.2	na	1.3	1.0	1.2	1.2	0.9	1.2	1.1	1.3	1.1	0.9	1.0	1.8	1.5	0.6	1.6	1.3
Oats	1.2	1.7	1.5	1.5	1.2	na	1.3	0.9	1.2	1.5	1.4	18.4	18.1	16.5	15.3	13.4	13.5	13.0	12.0	12.0	13.0	13.0
Barley	4.3	8.0	8.2	10.6	7.9	7.7	9.2	8.0	10.1	13.6	14.5	9.6	5.7	7.4	5.9	6.4	6.9	10.2	10.4	6.8	11.1	8.8
Sugarbeet	31.8	46.3	46	53.9	43.9	39	44.3	36.2	28.8	33.7	28.1	29.7	23	17.7	15.5	14.1	13.2	15.6	14.5	13.4	16.6	15.6
Sunflower	1.7	2.7	2.7	2.4	2.3	2.3	2.6	2.3	2.1	2.1	1.6	2.9	2.1	2.3	2.3	2.8	3.5	2.3	3.3	4.3	3.1	4.3
Potatoes	19.5	19.7	21	20.5	20	20	16.7	15.6	20.3	21	16.1	14.7	18.4	16.7	15.3	12.7	20.2	17.3	16.6	18.5	20.8	19.5
Vegetables	4.9	5.8	6.6	7.6	7.4	7.4	6.7	5.9	5.3	6.1	5.1	5.9	5	5.2	5.5	5.3	5.7	5.9	5.8	6.5	7.0	7.3
Fruits and Berries	1.1	2.4	2.6	3.1	3.2	2.6	2.9	1.5	2.1	2.8	1.2	1.9	1.9	2.8	1.1	0.8	1.5	1.1	1.2	1.7	1.6	1.7
Animal products (million tons, except eggs)																						
Meat	2.1	2.8	3.3	3.5	3.7	3.7	4.4	4.0	3.4	2.8	2.7	2.3	2.1	1.9	1.7	1.7	1.7	1.5	1.6	1.7	1.6	1.7
of which:																						
Beef and veal	0.7	1.2	1.3	1.5	1.6	1.6	1.5	1.5	1.3	1.1	1.1	0.9	0.8	0.8	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.5
Pork	1.0	1.3	1.6	1.3	1.4	na	1.3	1.1	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5
Poultry	0.2	0.2	0.3	0.5	0.6	na	0.7	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.7
Milk	14	18.7	20.4	21.8	21.9	na	24.5	22.4	19.1	18.4	18.1	17.3	15.8	13.8	13.8	13.4	12.7	13.4	14.1	13.7	13.8	13.8
Eggs (billion)	7.2	9.2	11.2	13.5	16.0	16.6	16.3	15.2	13.5	11.8	10.2	9.4	8.8	8.2	8.3	8.7	8.7	9.7	11.3	11.5	12.0	13.0

Notes: * Five year averages; ** In thousand constant 1995 PPP US\$; *** % change in CPI, average over period.

Source: State Statistics Committee of Ukraine; Penkaitis (1994, pages 48 and 87—88; IMF (various issues); Unversité de Sherbrooke (2006).

Table A 2.2
Nominal rates of assistance to agricultural industries and fiscal support for agriculture in Ukraine, 1992—2005 (%)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
NRAs for importables														
Sugar	11.5	4.3	3.4	-48.5	181.4	21.0	-0.9	-0.1	14.9	27.7	42.8	63.2	28.6	73.9
Poultry	-48.4	6.0	14.6	-14.9	-1.4	45.4	69.9	0.2	53.1	43.9	93.8	66.2	58.9	95.3
NRAs for exportables														
Wheat	-68.3	-34.1	75.2	-34.0	-45.2	103.8	16.1	-16.4	-43.1	-1.7	-9.3	-38.1	-21.4	-17.3
Maize	-19.4	76.0	44.6	-23.6	-8.6	-23.3	-15.8	9.1	-20.2	-5.6	-5.9	14.4	-25.0	-2.9
Rye	-40.0	8.5	161.3	49.3	30.4	8.4	17.7	40.8	11.5	37.2	-4.1	16.9	2.3	23.4
Barley	-59.3	27.9	16.7	-26.6	-8.2	-5.2	13.9	-21.4	-14.3	-18.0	-20.4	9.1	-9.9	-13.2
Oats	-61.1	-6.3	415.6	154.5	34.0	27.2	-23.2	43.1	39.8	11.6	3.1	83.9	11.9	69.4
Oilseeds	-46.7	15.4	12.7	-27.9	-21.4	-22.3	-31.5	-32.7	-28.9	4.8	-34.0	-24.6	-9.5	-19.4
Milk	-48.8	8.5	-33.8	-47.9	-35.9	-7.2	-3.5	-30.0	-35.1	-30.4	-31.8	-19.1	-17.2	3.5
Beef and Veal	-18.9	40.8	-18.6	-48.8	-15.3	11.2	-14.4	-13.4	6.8	6.3	-7.5	10.1	-16.6	20.7
Pigmeat	-63.4	-42.5	-36.0	-50.9	1.1	-9.4	36.9	16.5	1.0	38.7	12.8	-29.7	-5.6	48.2
Eggs	-40.1	-9.0	11.7	9.3	92.0	75.2	88.4	42.1	-8.7	-7.1	-30.2	-47.2	-38.0	-20.9
NRAs for nontradables														
Potatoes	0.0	0.0	0.0	0.0	-3.4	-57.1	-75.5	-65.1	-56.8	-46.1	20.7	10.0	-20.0	-19.9
Aggregate NRAs														
Importables	-22.1	4.8	6.1	-42.4	81.9	29.4	21.1	0.1	-27.3	34.6	64.1	4.0	43.4	86.6
Exportables	-49.8	-0.7	-6.7	-38.8	-23.1	8.9	5.3	-15.1	-17.2	-6.7	-18.2	-13.9	-17.9	-2.4
Nontradables	0.0	0.0	0.0	0.0	-3.4	-57.1	-75.5	-65.1	-56.8	-46.1	20.7	10.0	-20.0	-19.9
Weighted average	-47.5	0.1	-4.9	-39.4	-16.2	10.9	6.7	-13.8	-20.0	-3.8	-13.8	-11.4	-14.3	3.8
Standard deviation	25.5	30.3	129.3	62.7	66.5	42.4	42.5	33.8	33.6	27.7	37.9	44.9	26.4	42.3
Share of above products in gross value of agric. production* (%)	64.4	74.0	66.3	57.3	82.4	84.4	82.4	82.2	77.5	74.1	67.4	74.6	67.9	71.7
Fiscal support for agriculture (million UAH)														
Budget expenditure	5.4	81.4	1086.5	8999.7	1269.1	872.5	943.2	935.1	1035.7	1741.5	1473.1	2827.8	3250.5	4379.1
Tax expenditure	0.01	0.06	232.6	696.5	501.6	774.3	1261.8	2768.0	1771.0	1941.0	3349.7	3424.6	3563.7	5677.7
Total fiscal support**	5.4	81.5	1319.2	1596.3	1770.0	1646.8	2205.0	3703.1	2806.7	3682.5	4835.9	6570.3	6999.0	10271.3
Fiscal support/GDP (%)	10.7	5.5	11.0	2.9	2.2	1.8	2.1	2.8	1.6	1.8	2.1	2.5	2.0	2.3

Note: * Calculated at undistorted prices. ** Includes expenditure on intervention measures (mainly grain) as well as expenditure on the agricultural machinery leasing program by the state enterprise Ukragroleasing in 2002-2004.

Source: NRAs — own calculations using Anderson et al. (2006); Fiscal support for agriculture 1992-2001 — World Bank & OECD (2004, Table 3.6); Fiscal support for agriculture 2002-2005 — own calculations using Ministry of Finance of Ukraine and Laws on Budget.

Table A 2.3

Nominal rates of assistance for agricultural and non-agricultural products in Ukraine, 1992—2005 (%)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Covered products	-47.5	0.1	-4.9	-39.4	-16.2	10.9	6.7	-13.8	-20.0	-3.8	-13.8	-11.4	-14.3	3.8
Non-covered products	-47.5	0.1	-4.9	-39.4	-16.2	10.9	6.7	-13.8	-20.0	-3.8	-13.8	-11.4	-14.3	3.8
All agric. Products	-47.5	0.1	-4.9	-39.4	-16.2	10.9	6.7	-13.8	-20.0	-3.8	-13.8	-11.4	-14.3	3.8
Non-product specific input assistance (NPS)	2.42	0.95	2.83	1.72	2.98	2.58	2.67	2.11	0.85	1.01	1.18	1.21	1.69	2.49
Total agriculture incl. NPS*	-45.5	1.0	-2.2	-38.0	-13.3	13.5	9.4	-11.8	-19.2	-2.8	-12.7	-10.2	-12.7	6.3
Importables*	-22.1	4.8	6.1	-42.4	81.9	29.4	21.1	0.1	-27.3	34.6	64.1	4.0	43.4	86.6
Exportables*	-49.8	-0.7	-6.7	-38.8	-23.1	8.9	5.3	-15.1	-17.2	-6.7	-18.2	-13.9	-17.9	-2.4
Nontradables*	0.0	0.0	0.0	0.0	-3.4	-57.1	-75.5	-65.1	-56.8	-46.1	20.7	10.0	-20.0	-19.9
All agric. tradables*	-45.5	1.0	-2.2	-38.0	-13.3	13.5	9.5	-11.7	-19.1	-2.8	-12.7	-10.2	-12.7	6.3
All non-agric. tradables	3.2	2.5	2.1	1.6	1.9	2.5	2.7	3.8	3.6	3.4	3.4	3.4	3.5	3.3
Relative rate of assistance (RRA)**	-47.2	-1.4	-4.2	-39.0	-14.9	10.7	6.7	-14.9	-22.0	-6.1	-15.6	-13.2	-15.6	2.9

Notes: * NRA including product-specific, decoupled and non-product-specific subsidies; ** RRA = [the ratio of (1 + NRA) for agricultural tradables to (1 + NRA) for non-agricultural tradables] — 1, in percentage terms.

Source: Own calculations using methodology in Anderson et al. (2006).

Table A 2.4
Economic indicators of agriculture and the food processing industry in Ukraine, 2000—2005

		2000	2001	2002	2003	2004	2005
Agriculture							
Gross agricultural output	UAH m	58,475	69,690	70,049	71,151	92,543	106,641
	% total output	13.5	13.3	12.2	10.3	10.1	9.6
Value added	% GDP	14.4	14.4	13.0	10.9	10.8	10.8
Value added/output	%	42.7	43.3	42.0	41.4	40.4	40.1
Structure of value added:							
Compensation to employees	% sector value added	18.2	18.1	15.9	14.4	14.0	16.1
Profit, mixed income	% sector value added	75.4	76.7	80.6	81.9	84.7	80.1
Net taxes on production & imports	% sector value added	6.4	5.2	3.4	3.6	4.8	5.5
Employment	thousand people	2,549	2,206	1,877	1,537	1,174	1,038
	% total employed	18.6	17.1	15.3	13.1	10.4	9.1
Average wage	UAH	114	154	183	219	295	415
Exports	UAH m	4,963	5,758	7,361	4,052	8,262	9,441
	% total exports	4.7	5.1	5.9	2.6	3.9	4.1
	% sector output	8.5	8.3	10.5	5.7	8.9	8.9
Imports	UAH m	921	862	801	5,024	3,338	3,804
	% total imports	0.9	0.8	0.7	3.4	1.8	1.7
	% sector output	1.6	1.2	1.1	7.1	3.6	3.6
Exports/imports	Index	5.4	6.7	9.2	0.8	2.5	2.5
Food processing industry							
Gross output	UAH m	48,892	64,810	68,973	84,470	103,221	116,639
	% total output	11.3	12.4	12.0	12.3	11.3	10.5
Value added	% GDP	7.8	7.7	7.9	8.2	4.2	7.8
Value added/output	%	27.3	24.2	25.8	25.8	24.1	26.0
Structure of value added:							
Compensation to employees	% sector value added	30.9	26.3	24.7	25.5	34.1	39.5
Profit, mixed income	% sector value added	15.0	24.8	27.6	28.6	15.6	17.7
Net taxes on production & imports	% sector value added	54.1	48.9	47.6	45.9	50.4	42.8
Employment	thousand people	518	485	464	445	452	465
	% total employed	3.8	3.8	3.8	3.8	3.9	4.0
Average wage	UAH	281	364	423	496	597	779
Exports	UAH m	7,775	7,780	8,961	12,246	16,725	16,135
	% total exports	7.3	6.9	7.2	7.9	7.9	7.1
	% sector output	15.9	12.0	13.0	14.5	16.2	12.1
Imports	UAH m	3,456	5,005	4,903	6,701	6,648	9,700
	% total imports	3.5	4.6	4.3	4.5	3.6	4.3
	% sector output	7.1	7.7	7.1	7.9	6.4	7.3
Exports/imports	Index	2.2	1.6	1.8	1.8	3.9	1.7

Source: State Statistic Committee of Ukraine.

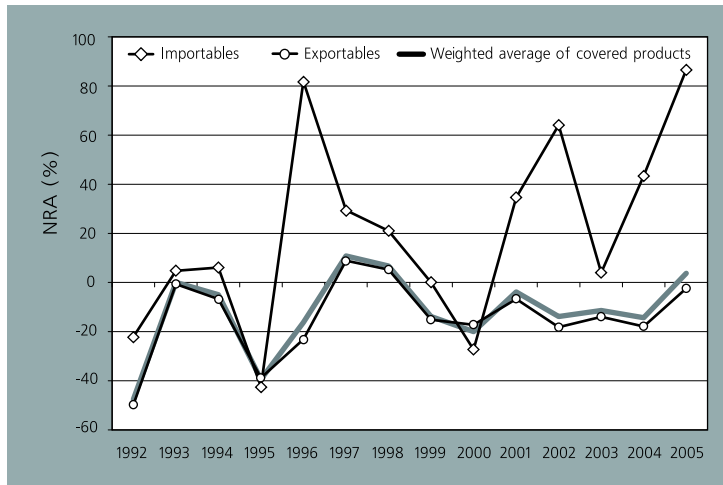


Figure A 2.1
Development of gross agricultural output in Ukraine by type of farm, 1990—2005 (1990 = 100)
 Source: State Statistics Committee of Ukraine.

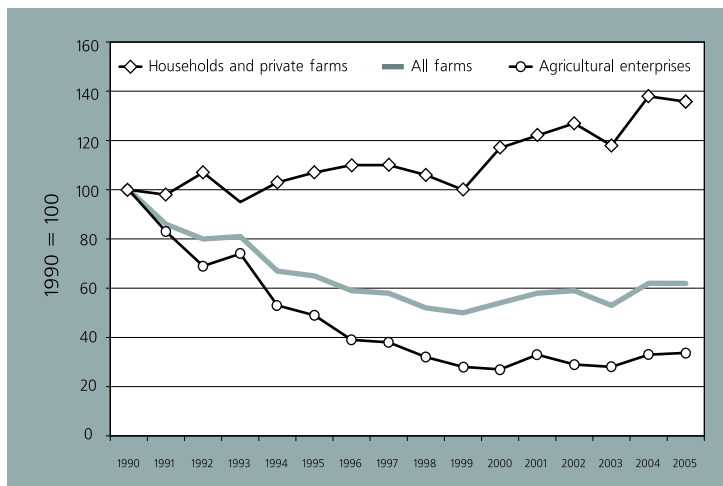


Figure A 2.2
Nominal rates of assistance to agriculture in Ukraine, 1992—2005 (%)
 Source: Table A 2.2.

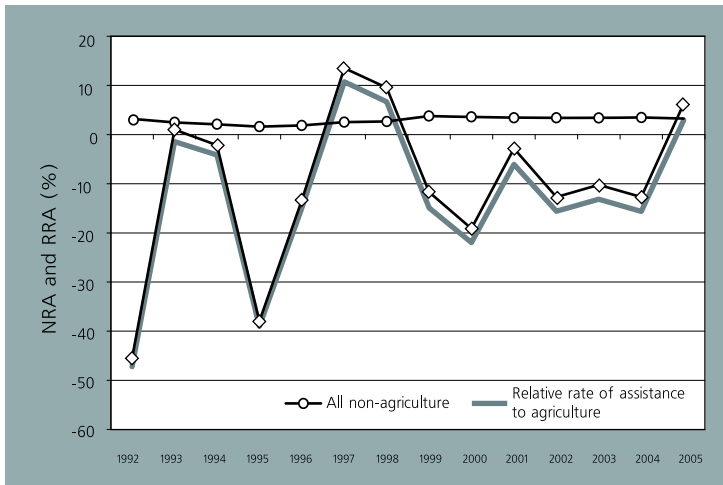


Figure A 2.3
 Nominal rates of assistance to agriculture and non-agriculture, and the relative rate of assistance to agriculture in Ukraine, 1992–2005 (%)
 Source: Table A 2.3.

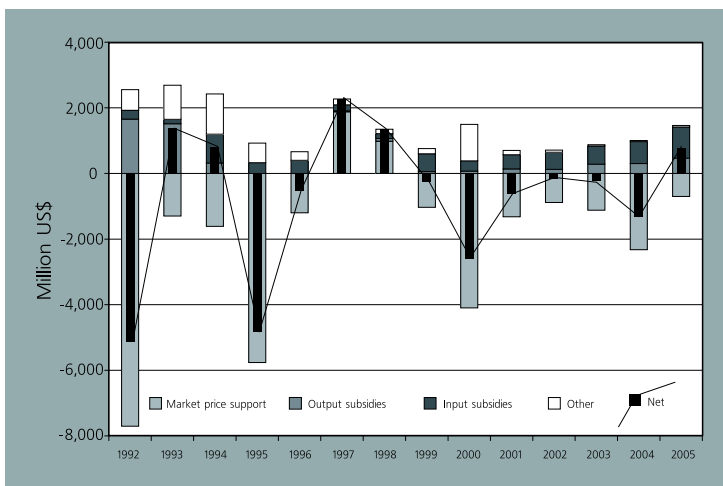


Figure A 2.4
 The composition of producer support in Ukrainian agriculture, 1992–2005 (million US dollars)
 Source: Own calculations using OECD (2006) and fiscal support data from Table A 2.2



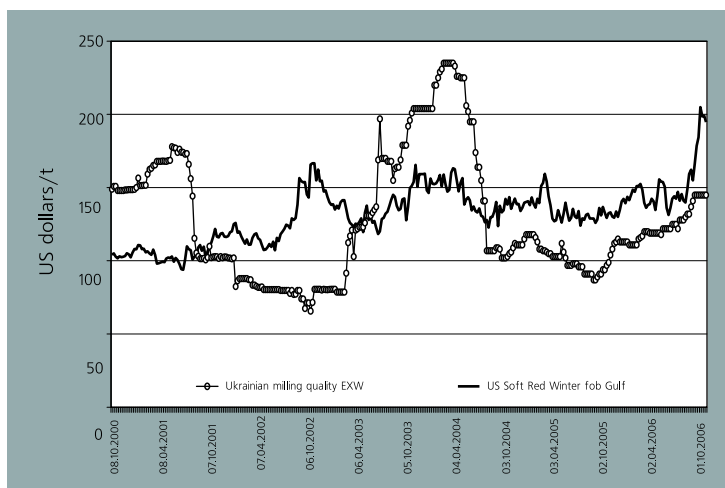


Figure A 2.5

The evolution of wheat prices in Ukraine and on the world market, 2000—2006 (US dollars/t).

Source: UkrAgroConsult (various issues).





3. Fiscal Support to Agriculture in Ukraine

This chapter was produced in 2006 requested by the Ministry of Finance to assess the fiscal support to agriculture in Ukraine. Budget expenditures, tax expenditures and other fiscal support during the years 2002 to 2006 have been assessed to derive conclusions in view of WTO accession and fiscal reforms. As demonstrated, total fiscal support to agriculture and rural areas grew almost threefold over this period, fluctuating around 2% of Ukraine's GDP, with significant tax privileges provided to the sector compared to others, thus creating a tax bias in the Ukrainian economy.

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Introduction

Ukrainian agriculture enjoys a significant fiscal support¹⁴ from the state coming in a form of Budget expenditures and Tax expenditures.¹⁵ As Table 3.1 shows the total fiscal support to agriculture and rural areas grew almost threefold over the last four years, fluctuating around 2% of Ukraine's GDP. Although in absolute values Ukraine spends a tiny fraction of that, for example, EU or USA does, however, in terms of GDP fraction it already spends a lot, e.g. in EU this ratio equaled 0.65%, in USA — 0.73%.¹⁶ Moreover, we argue that total fiscal support to agriculture (TAFS) documented in Table 1.1 represents only the lower bound estimate since benefits (mainly tax benefits) from Free Economic Zones and Territories of Priority Development were not included in these estimates (due to the lack of relevant data)

Significant tax privileges compared to other sectors that are greater than even budget expenditures, should have compensated the lack of funds in a budget. As Table 3.1 shows tax expenditures have not been less than UAH 3 bn annually over the last several years, whereas industrial enterprises of automobile, airplane and ship construction, space, and metallurgical sectors received only UAH 0.9 bn altogether of tax expenditures over 2001—2003. Most Ukrainian tax expenditures are excluded from WTO domestic support reduction commitments, meaning the absence of external leverage to eliminate them. Since agrarian lobby is considerably strong in Ukraine, it is very likely that tax privileges for agriculture will persist in the future. On the contrary, as Table 3.1 shows, agriculture contributes much less to the budget than it receives from it,¹⁷ thus creating a tax burden bias in Ukrainian economy. Fiscal support should leverage government policies to increase productivity and competitiveness of the agriculture and food value chain. If the efficiency of fiscal support is not efficient and dominated by the influence of particular lobby groups in specific sub-sectors, the impact of fiscal support can become negative. While promoting of different production subsidies, the government implicitly ignores efficiency and productivity as an objective for agricultural policy. Instead, the government pursues the goal of food self-sufficiency¹⁸

¹⁴ However, the total support to agriculture has been much higher in Ukraine, since significant non-fiscal measures benefit domestic agricultural producers as well. High import tariffs protect domestic producers from foreign competitors. Also, there are other than tariffs measures being often nontransparent and distortive for production and trade. For example, sugar quota and privileged inputs supply to agricultural producers might serve as an illustration of such measures.

¹⁵ Tax Expenditures include tax privileges, tax arrears, and tax write-offs.

¹⁶ Zorya, S. (2005): Reforming Agricultural Support. In: Meyers, W., et al (eds): Refocusing Agricultural and Rural Development Policies in Ukraine: action Plan for the Road Ahead. Washington, DC: USAID. p. 18 <www.dec.org/pdf/docs/PNADD.pdf>.

¹⁷ Moreover, tax proceeds from the whole agro-food sector are also not sufficient to cover fiscal expenditures on agriculture.

¹⁸ Very often Ukrainian policy makers understand food security as food self-sufficiency, thus arguing in favour of increasing production but neglecting efficiency and competitiveness.

by increasing output using considerable subsidies, import tariffs and non-tariff barriers. Policymakers aim to keep existing farm structures in place and continue granting aid and tax privileges to producers. Fiscal support is designed to stimulate large agricultural producers, making it much easier for them to get financial assistance than for private farmers, for example. Finally, agricultural policy makers implicitly rely on agricultural producers in providing social services in rural areas and their development, thus delaying structural reforms in the sector.

Table 3.1*Total Fiscal Support to Agriculture in Ukraine, UAH m*

	2002	2003	2004	2005*	2006**
Budget expenditures	1,473.1	2,827.8	3,250.5	4,379.1	6,678.5
Tax expenditures	3,349.7	3,424.6	3,563.7	3,493.7	5,769.9
Other Fiscal Support	13.1	318.0	184.8	214.5	Na
Total fiscal support to agriculture (TAFS)	4,835.9	6,570.3	6,999.0	8,087.3	12,448.4
Share of TAFS in GDP	2.1%	2.5%	2.0%	1.9%	2.4%
Ratio of tax proceeds from agriculture to TAFS	34.6%	19.6%	23.6%	Na	Na
Ratio of tax proceeds from agro-food sector to TAFS	120.5%	87.6%	87.9%	Na	Na

Source: IER databank and estimates; Notes: * — proj.; ** — planned; Na — not available.

Budget Expenditures on Agriculture and Rural Development

In this section we consider State Budget spending¹⁹ on agriculture and rural development. Table 3.2 lists the whole set of budget spendings grouped into MAP expenditures and Other Ministries' expenditures, since most expenditures belong to MAP. We then grouped MAP expenditures into several subgroups, according to the specifications listed in the Law of Ukraine "On the State Budget of Ukraine" (e.g. "Financial support of livestock and crop production"; "Education and training"). These subgroups were then arranged according to their effect on production and trade, i.e. distortional or non-distortional. Such a division generally mimics the WTO classification of state domestic support measures, thereby establishing two broad categories: "amber box" and "green box" measures. "Production subsidies" group in this report corresponds to the "amber box" measures, while other two groups (i.e. "Growth enhancing" and "Other measures") correspond (with some exceptions) to the "green box" measures. Other ministries' measures are classified as Growth-Enhancing, thus falling into the green box according to the WTO classification.

¹⁹ Allocated via different ministries, e.g. Ministry of Agricultural Policy (MAP), Ministry of Finance, State Committee for Land Resources etc.

As Table 3.2 shows that the total agricultural budget expenditures (TABE) grew from UAH 1.47 bn in 2002 to the planned UAH 6.68 bn in 2006. At the same time the share of TABE in total budget expenditures has been growing (although not steadily) from 3.3% to 4.9% over 2002—2006. If we compare the magnitude of both types of expenditures to 2002 benchmark then total budget expenditures grew by 3.1 times in 2006, whereas TABE grew by 4.5 times over the same period. The ratio of tax proceeds from agriculture to TABE shows that the agriculture sector received almost twice more from the budget than contributed to it, which together with significant tax expenditures creates an imbalanced tax burden on Ukrainian economy, thus potentially decreasing the entire competitiveness of the economy.

We observe that the MAP expenditures have been prevailing in total budget expenditures, accounting for more than 90%. It is worth mentioning that although this figure is a bit lower for 2005 and 2006, these are planned figures, whereas Table 3.2 reports executed figures for 2002—2004. Such a low fraction of Other Ministries' expenditures in TABE probably reflects an implicit assumption of the Government that MAP must be responsible for, in addition to agricultural policy, the whole range of rural development issues, such as social issues in rural areas, rural infrastructure, health, education, etc. However, this should primarily be the task of other Ministries.

Analyzing planned and actual executed TABE over several years reveals problems with budget expenditure planning. The existence of a particular program in a state agenda is not sustainable and lacks continuity. This shows that Ukrainian government and MAP in particular do not have a long-term strategy on the budget expenditures for agricultural and rural development, which reflects that Ukraine does not have any officially adopted strategy of agriculture and rural development yet. Budget programs are often underfinanced (especially in 2000—2002, see Table 3.3) and not uniformly distributed over the whole year, providing only around 5% of TABE in the first quarter, but over 50% in the last (e.g. 39% of TABE in December). The lack of a strategy and uneven expenditures make long-term investment planning very difficult for agricultural enterprises and increase entrepreneurial risks.

Table 3.2*Public Expenditures on Agriculture, UAH m*

	2002	2003	2004*	2005	2006**
MAP programs (in % of TABE):	95.7%	91.4%	91.1%	90.4%	78.3%
Production subsidies (in % of TABE):	22.1%	21.4%	32.8%	34.89%	38.40%
Financial support of livestock and crop production:	73.9	236.2	421.0	689.5	1,992.5
Slaughter premiums per kg w/min. weight threshold	Na	174.0	338.0	553.5	745.0
Support to horticulture, viticulture, and hops	111.2	151.3	109.1	175.0	227.7
Partial compensation of interest rates for credits	119.6	74.8	141.5	350.0	260.0
Financing of sowing winter and spring grain crops	Abs	Abs	247.9	Abs	Abs
Financial support of rural farms	4.5	13.4	1.1	27.3	28.0
Fertilizer subsidies	Abs	40.0	109.6	Abs	0.0
Partial compensation of costs of agricult. machinery	15.7	18.3	36.2	270.0	32.0
Milk processing	Abs	Abs	Abs	10.0	4.0
Growth-Enhancing measures²⁰ (in % of TABE):	65.0%	47.0%	51.6%	54.5%	53.3%
Rural Development	8.7	42.4	24.3	23.1	24.4
Research and Development	161.5	66.5	77.9	143.1	154.5
Education and training	382.9	490.8	619.8	913.5	1,041.7
Public stockholdings	19.2	13.5	50.0	25.9	10.0
Pest and disease control	4.9	7.0	9.9	20.0	30.0
Food safety and quality control	297.5	370.0	471.0	585.0	704.0
Extension and Advisory Services	1.8	6.3	8.6	8.1	10.0
Insurance costs compensation	0.0	0.0	0.0	54.0	10.0
Land Resources	0.2	5.6	10.4	15.0	5.0
Selection programs:					
Livestock	13.9	76.6	112.8	124.0	110.0
Crops	11.7	41.7	42.8	103.3	104.7
Fish	0.3	1.3	2.0	6.5	6.8
Other measures:					0.0
Natural disaster relief	2.3	695.3	67.3	20.0	25.0
Environment Protection	29.2	44.6	61.1	81.8	109.6
Others:	150.4	189.2	336.6	315.6	340.1
Administrative costs	7.9	50.8	59.2	80.3	101.2
Other Ministries' programs (in % of TABE):	4.3%	8.6%	8.9%	9.6%	21.7%
Rural Development	2.4	86.5	104.3	170.3	1,075.3
Education and training	47.7	71.6	102.9	121.0	103.7
Selection programs	1.3	13.0	11.5	12.3	13.9
Land Reform	3.5	35.7	28.2	62.7	154.7
Total agricultural budget expenditures (TABE)	1,473.1	2,827.8	3,250.5	4,379.1	6,678.5
Share of TABE in total public expenditures	3.3%	5.0%	4.1%	3.7%	4.9%
Share of public expenditures on agriculture in total GDP	0.7%	1.1%	0.9%	1.0%	1.3%
Ratio of tax proceeds from agriculture to TABE	113.5%	45.5%	50.8%	Na	Na
Ratio of tax proceeds from agro-food sector to TABE	395.6%	203.5%	189.2%	Na	Na

Source: IER estimates based on State Treasury Report on the State Budget Execution 2000, 2001, 2002, 2003, 2004 and Laws of Ukraine "On State Budget" (2005 and 2006 years); Notes: * — numbers for 2000—2004 period are actual budget expenditures; ** — numbers for 2005 and 2006 are planned budget expenditures; Abs — program is absent; Na — data not available.

²⁰ Estimates of the Growth-Enhancing measures as % of TABE include Other Ministries' Programs as well.

Table 3.3*Execution level of selected budget programs for agriculture and rural development, %*

	2000	2001	2002	2003	2004
Production subsidies:					
Financial support of livestock and crop production	87.86	45.86	62.90	99.03	98.03
Support to horticulture, viticulture, and hops	131.52	91.85	79.89	97.30	77.92
Partial compensation of interest rates for credits	28.53	46.40	79.63	99.71	74.39
Financial support of rural farms	100.00	50.17	37.61	99.49	8.70
Growth-Enhancing measures:					
Rural Development	-	-	21.56	99.92	97.32
Research and Development	-	-	74.11	87.12	85.08
Education and training	-	-	88.49	93.03	93.37
Public stockholdings	-	100.00	46.79	45.13	71.43
Pest and disease control	89.27	40.61	60.38	99.99	98.77
Food safety and quality control	100.47	75.44	86.00	93.91	93.00
Extension and Advisory Services	-	-	67.54	85.44	93.40
Land Resources	95.17	79.25	3.33	99.29	86.35
Selection programs:					
Livestock	64.68	67.04	23.71	99.72	91.00
Crops	51.55	65.67	39.52	99.71	80.80
Fish	95.34	47.63	26.15	100.00	70.29
Other measures:					
Natural disaster relief	99.98	76.51	34.09	97.42	96.14
Environment Protection	-	-	65.51	99.24	92.39

Source: IER estimates based on State Treasury Report on the State Budget Execution 2000, 2001, 2002, 2003, 2004 and Laws of Ukraine "On State Budget" (2000-2004 years).

The structure of TABE, which mimics the WTO classification of domestic support measures, has not changed significantly over the last five years and increasingly favors of production subsidies. As Table 3.2 shows, Production Subsidies (or amber box measures) grew from 22.1% to almost 39% of TABE. On the other hand, Growth-Enhancing measures (as part of green box measures) consumes around 50% of TABE. "Production subsidies" measures support either production of particular agricultural produce (meat, milk, grain etc) or subsidizing the costs of commercial credits, fertilizers, machinery etc.²¹ The reason for this is that policy makers implicitly (perhaps inherently) follow planned economy principles, targeting gross output goals instead of efficiency and productivity increases and believe that production subsidies is a good tool. Preserving the current budget expenditures structure conserves existing farm structure and procedures (often nontransparent) of granting aid to specific producers with high risk of corruption. Budget funds as well as fiscal support is mostly granted to large agricultural producers that have much easier access to financial assis-

²¹ For details see Description of Public Agricultural Expenditures below.

tance than smaller private farmers, for example. In this manner, policy makers are stimulating large-scale agricultural production, which is not fair to smaller private farms and small enterprises.

Production subsidies fall into the amber box, thus subject to reduction according to the WTO classification. In fact, AMS (Aggregate measure of support) has been a hot topic during the WTO accession negotiations for Ukraine. It has not agreed about its bound AMS yet. But according to preliminary results there are two options. Ukraine expects USD1.14 bn bound AMS (based on 1994—1996 reference period), whereas USA and Australia's offer is much stricter, i.e. USD 265 m (based on 2000—2002 reference period). On the other hand, production subsidies total USD287 m in 2005 and are planned to be USD499 m in 2006. It is worth mentioning that production subsidies constitute only a fraction of Ukraine's amber box measures. For example, there are subsidies to animal producers paid from the value added tax received by food processing enterprises (from selling dairy and meat products) that also fall into the same box measures. So, under favorable scenario (USD1.14 bn of AMS) Ukraine will have no problems with WTO requirements regarding domestic support measures to agriculture; if Ukraine (in a case of USD 265 m of AMS) Ukraine accedes the permitted level of AMS already, this will endanger Ukraine's accession to the WTO.

Generally, a large share of Growth-Enhancing measures (or green box measures) in TABE generally speaking is a good sign. Growth-Enhancing measures here treated as such that potentially might increase economic productivity, efficiency (e.g. research, education, training, land resources, rural development and disease control). However, the effectiveness of these programs has been questionable (see Zorya (2005) for details). For example, as Table 3.2 shows a significant amount of budget funds has been increasingly spent on education, training, research and development (e.g. more than UAH 1 bn in 2006). However, currently most domestic institutions fail to produce agricultural research meeting international standards. The quality of education and knowledge that students receive in agricultural higher education institutions lags far behind international standards. At the same time extension and advisory services and rural development are definitely paid much less attention than necessary. It is encouraging that the Government plans a significant increase in rural development spending (more than UAH 1 bn in 2006).

Description of Public Agricultural Expenditures

Financial support of livestock and crop production

The program encompasses a broad range of measures:²² slaughter premiums (cattle, pigs, and poultry) with minimum weight threshold; subsidies for meat cattle breeding, cattle identification and registration; subsidies for sheep dam and young sheep aged above one year; subsidies for beekeeping, silkworm breeding, hop, flax and hemp production (mostly partial compensation of production costs); partial compensation of costs of electricity consumed by agricultural producers for crops irrigation; subsidies for ecologically clean milk sold to dairy enterprises for baby food production. However, a bulk of budget funds has been used for slaughter premiums, i.e. producers selling young cattle, pigs, and poultry of above-average weight are entitled to receive additional payments per kilo.²³

Support to horticulture, viticulture, and hop growing

The government provides eligible farms with funds for purchasing inputs and equipment. The MAP selects the farms on a competitive basis.²⁴ This program utilizes funds collected from the a special duty for horticulture, viticulture and hop growing according to the following proportion: 70% goes to viticulture development, 30% to horticulture and hop growing.²⁵

The partial interest rate compensation program

In the beginning of 2001, the government started a program on partial compensation of interest rates of commercial bank loans for agricultural producers. The Law²⁶ states that the compensation should not be less than 50% of the NBU re-finance rate. Agricultural enterprises can receive a compensation of short-term credits obtained in national or foreign currencies for covering production costs (e.g. purchases of fuel, feed, spare parts, fertilizers, pests, insurance payments etc) as well as of long-term credits obtained in national or foreign currencies for financing costs on purchasing fixed capital.

²² Accounting Chamber of Ukraine (2005a): On results of audit of funds use allocated from the State Budget of Ukraine for financial support of livestock and crop production in 2003—2004 years and in the 1st quartile of 2005. <www.ac-rada.gov.ua>.

²³ Regulation of the MAP and MF # 114/239 as of 31 March 2004.

²⁴ Regulation of MAP and MF #178/346 as of May 25 2004; Regulation of MAP # 238 as of June 30 2004.

²⁵ Law of Ukraine # 587—XIV “On duty for horticulture, viticulture, and hop growing development” as of 09 April 1999.

²⁶ Article 12, Law of Ukraine “On Stimulation of Agricultural Development for 2001—2004” as of 18 January 2001.

Table 3.4*Partial Interest Rate Compensation, %*

	2002	2003	2004	2005
Interest Rates Compensated by the Government:				
Short-term credits:				
- In UAH	10-7	10-7	8	10
- In USD	7-5	7-5	6	7
Long-term credits:				
- In UAH	10-7	10-7	14-12	14-12
- In USD	5-4	7-5	9-8	9-8
Rates, eligible for compensation	Up to 21-18	Up to 21-18	Up to 19-18	Up to 21-20
NBU refinance rate	9.0	7.0	8.7	9
Interest rate of commercial banks	25	20.2	17.9	16

Source: The Laws on "State Budget of Ukraine" 2002—2005, Regulation of MAP and MF # 212/427 as of 02 July 2003, Regulation of CMU # 34 as of 15 January 2005, etc, Bulletin of NBU.

Financial support for rural farms

This is competitive microcrediting program, allowing eligible farmers getting financial assistance from the state budget via the Ukrainian State Fund for compensating interests on commercial banks loans if they spend the funds exclusively for production or processing of self-produced agricultural goods.²⁷ In general, this constitutes a subsidization of input costs.²⁸

Financing of sowing winter and spring grain crops

This program partially compensates costs of agricultural enterprises for sowing of winter and spring grain crops. The compensation is provided proportionally to the area of sown land. A special commission determines the eligibility and the amount of compensation under this program.²⁹

Fertilizers subsidies

The government partially subsidized the price of domestically produced fertilizers to farmers. Agricultural producers receive reimbursements from the state budget of around 40% of the fertilizer costs.³⁰ Additionally, the government fixed wholesale prices on fertilizers for agricultural producers which are lower than

²⁷ Accounting Chamber of Ukraine (2002): On results of audit of funds use allocated from the State Budget of Ukraine for state support of rural farms over 1998—2001 years. www.ac-rada.gov.ua; and Accounting Chamber of Ukraine (2005b): On results of audit of funds use allocated from the State Budget of Ukraine on implementation of the special state programs for agricultural producers support in 2004. www.ac-rada.gov.ua.

²⁸ Regulation of MAP and MF # 162/426/181 as of 17 June 2002.

²⁹ Regulation of CMU # 96 as of 30 January 2004.

³⁰ Own calculations based on the Resolution # 1046 of the CMU as of 12/08/2004 and on the Order of the Ministry of Industrial Policy # 18 as of 20/01/2004.

market prices. Thus producers, of fertilizers subsidize agricultural producers at the expense of their own forgone revenues.

Partial compensation of costs of agricultural machinery

Under this scheme the government compensates agricultural producers and enterprises of food and food processing industry for 30% of the amount spent on domestically produced equipment according to the list and prices recommended by the Interdepartmental Expert Council.³¹ The MAP selects eligible agricultural producers on a competitive basis based on applications submitted.

Milk processing

According to this program, dairies eligible for this competitive program may get financial assistance from the state budget via MAP if they spend the funds provided exclusively for covering costs related to dairy's reconstruction and technical development as well as on modern technology adoption.³²

Rural Development

Rural development funding has been used for several state programs, managed by MAP and other ministries: They include the following: state privileged crediting of individual rural builders; restructuring and development of public utilities in rural areas; development of physical training and sports among rural population; investments in health-care institutions, gas supply networks, roads, seaports, development of financial services in rural areas, etc.

Research and Development programs

Budget expenditures on research and development include more than 10 state programs financing exploratory development and applied research, scientific works of state and inter-sectoral programs, research by scientific institutions and research related to particular products.

Education and Training

Expenditures on education and training services in Ukraine include maintenance of higher schools of the 1st, 2nd, 3rd and 4th accreditation level, and graduate schools of the 2nd and 3rd accreditation levels (academies, institutes, training centers etc.). Also, funds are used for training, privileged state credits for human resource development etc.

³¹ Regulation of CMU # 959 as of 28 July 2004; Accounting Chamber of Ukraine (2003): On results of audit of funds use allocated from the State Budget of Ukraine for financing measures related to compensation of debts for domestic agricultural machinery, partial compensation of domestic machinery designining and development costs and support to domestic machine-building industry for agriculture. <www.ac-rada.gov.ua>.

³² Regulation of CMU # 1125 as of 30 November 2005.

Selection in livestock and crop production

Government funds are allocated for programs on selection in crop and livestock production as well as selection in fishery. Eligible farmers and institutions can receive partial or full cost compensation for purchased or sold genetic resources, as well as for overhead expenses in selection.³³

Public stockholdings

Budget funds are used for purchasing and storage of various crop seeds (grain, peas, sunflower, sugar beet, corn etc) to meet the demand of regions that do not produce these seeds or to insure sufficient supply of the seeds caused by unfavorable weather conditions.³⁴ Also, according to Ukrainian legislation,³⁵ some state agencies are responsible for purchasing agricultural commodities for the public stockholding (e.g. Agrarian Fund, JSC "Khib Ukrainy", and State Reserve Committee). However, their activities primarily target price stabilization on a market via intervention or pledge purchases.

Pest and disease control

This program funds precautionary measures against infectious animal disease, certain dangerous pests and quarantine measures.³⁶

Extension and advisory services

Extension and advisory services are generally neglected in Ukraine, thus being poorly represented by public programs in this classification, e.g. state exhibitions, etc.

Food safety and quality control

This program funds inspection services of certain products to insure health and safety standards, including antiepidemiologic measures. Government spending on inspection services includes expenditures on the maintenance of state veterinary institutions, state seed inspections, and state bread inspections.

³³ Accounting Chamber of Ukraine (2005b): On results of audit of funds use allocated from the State Budget of Ukraine on implementation of the special state programs for agricultural producers support in 2004. Accounting Chamber of Ukraine (2001): On results of audit of funds use allocated from the State Budget of Ukraine to the Ministry of agricultural policy for antiepidemiologic measures and state programs of selection in livestock and crop production in 2000. www.ac-rada.gov.ua; Regulation of MAP # 123 as of 14 May 2001; Law of Ukraine "On the State program of selection livestock-breeding", #1517—15 as of February 19, 2004; Regulation of MAP and MF # 94/23/210 as of 22 March 2004.

³⁴ Regulation of MAP and MF # 12/71 as of 23 January 2003.

³⁵ Law of Ukraine "On Stimulation of Agricultural Development for 2001—2004" as of 18 January 2001; Law of Ukraine #1877—IV "On State support of agriculture of Ukraine" as of 24 June 2004.

³⁶ Law of Ukraine # 180 "On crop protection" as of 14 October 1998; Regulation of CMU # 181 as of 13 February 1999.

Land resources

Expenditures on land reform include expenditures on implementing a new Land Law, implementation of land registration procedures, cadastral examinations, determination of soil quality and agrochemical land certification.

Natural disasters relief measures

This group of payments encompasses payments to producers in disadvantaged regions,³⁷ to farmers that suffered from unfavorable weather conditions in 2003,³⁸ relief from natural disasters,³⁹ etc.

Environmental protection

Spending on environment protection is precisely determined within the framework of the state programs, e.g. protection and effective use of forest and water resources etc.

Others

The subgroup "others" includes all other budget expenditures not listed above (including administrative costs of the MAP).

³⁷ Regulation of MAP and MF # 60/138 as of 27 February 2002.

³⁸ Regulation of CMU # 410 as of 31 March 2003.

³⁹ Regulation of CMU # 923 as of 19 June 2003.



4. Impact of WTO Membership on Agricultural Trade

This paper was prepared for the WTO parliamentary hearing at the Ukrainian Parliament in October 2006. It describes the major policy implications of WTO accession in the agricultural sector regarding market access, domestic support measures and sanitary and phytosanitary measures. The analysis showed that WTO membership would stimulate and accelerate Ukrainian agricultural sector reforms, positively influence domestic and foreign investments, and have a positive impact on agricultural trade due to the introduction of international food safety standards and the reduction of technical barriers to trade. Moreover, WTO membership will also provide Ukraine with a voting right in future debates on international rules of agrarian policy and agricultural trade. As a result, Ukraine as a WTO member will be able to fully use its agrarian potential.

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Introduction

Agreement on agriculture provisions, elaborated during the Uruguay Round, which ended in 1994, defined agricultural sector negotiation conditions for Ukraine on WTO accession. Besides, there are several agreements dealing with this sector: "Agreement on Sanitary and Phytosanitary Measures" (SPS), "Agreement on Technical Barriers to Trade" (TBT), "Agreement on investment activities concerning trade" and also "Agreement on Trade Aspects of Intellectual Property Rights" (TRIPS). It should also be taken into account that WTO is not a static organization. Today multilateral negotiations take place within the Doha Round. As a result, there could be more decisions made on agriculture. These decisions should be taken into account when developing agrarian policy in Ukraine.

In general, the Agreement on agriculture and specific annexes contain provisions on four major domains: market access, internal support, export subsidies, and sanitary and phytosanitary measures.

Market access

Ukraine suggested reducing its agricultural tariffs from roughly 30% to 13% on average. The maximum possible level of tariffs on agricultural products is expected to be 20% except for several products such as sugar (50%) and sunflower-seed oil (30%). Membership in WTO would also entail that the frequent use of specific agricultural tariffs in Ukraine would have to be curtailed in favor of ad valorem tariffs. Furthermore, it appears that Ukraine would not be permitted to make use of special safeguard provisions. Special safeguard provisions were introduced at the end of the Uruguay Round to provide such countries as the EU — that were required to transform variable import levies and other non-tariff barriers to trade into bound tariffs — with a means to deal with the import surges that might result. Since Ukraine makes no use of such measures, it will not be required to subject them to "tarification" as a result of WTO membership and, therefore, be in no greater danger of import surges after the entrance than it was before.

A specific area with regard to market access is sugar. Sugar is the one important agricultural product for which Ukraine has offered no tariff concessions. Ukraine is a net importer of sugar, so imports controls along with the domestic production quotas that have been implemented are the tools for domestic price control. According to the preliminary results of the WTO accession negotiations, Ukraine is going to implement a tariff quota for import of raw sugar at 260 thd. tons level (though some countries insisted on 400 thd. tons level) combined with custom duty rate of 2%. Over and above the quota the import tariff will be reduced to 50% ad valorem. Moreover, Ukraine and other members of the WTO should expect to be prepared for further necessary modifications of its sugar market in



case of successful results of the Doha Round of WTO negotiations. The most possible scenario for Ukraine is the adoption of the Swiss formula⁴⁰ of tariff reduction that would mean further sharp decrease in custom duty rates on sugar imports in the world (see Table 4.1).

Table 4.1

Comparative summary of Doha Round offers on agriculture by EU, US and G—20: market access

Market access	EU	US	G-20
Tariff redu	Tariff level: 0-30% = 20% cut- 30-60% = 30% cut 60-90% = 40% cut 90% + = 50% cut	Tariff level: 0-20% = cut of 55% to 65% 20-40% = cut of 65% to 75% 40-60% = cut of 75% to 85% 60% + = cut of 85% to 90%	Tariff level: 0-20%= 45% cut 20-50% = 55% cut 50-75% = 65% cut 75% += 75% cut
Tariff cap	100%	75%	100%
Sensitive products	Max. 8% of tariff lines	Max. 1% of tariff lines	-

Source: Agra Europe Weekly (2005).

According to these propositions, Ukrainian (along with other countries’) tariffs on sugar might be reduced by 30—85%. This would mean that import sugar tariffs may be established at 38—27% level when the Doha Round negotiations are finished and Ukraine joins the WTO. Conducting sugar negotiations under the “sensitive product” regime to avoid maximum tariff reductions will be a “discovery” of new tariff quotas to compensate exporters and to provide market access guarantees (Agra Europe Weekly, 2005). It means that if sugar is considered as “sensitive” product, Ukraine could be potentially required to increase tariff quotas on sugar (maybe up to 400 thd. t).

Domestic support

The area of domestic support is perhaps one of the most controversial areas in the negotiations between Ukraine and WTO working party. According to the agricultural agreement provisions on subsidizing or domestic support, members of WTO agreed to reduce the amount of agricultural producer support and to introduce instruments that cause less asymmetry in production and trade shares. In general, the agricultural agreement divides agricultural producer support into two broad categories: (i) support that is subject to reduction, and (ii) support that is not subject to reduction.

The instruments of support of the first category (that is not due to reduction) belong to the so-called “green” or “blue” boxes or fall under the so-called amendment “de minimis”. Fundamental feature of this category is absence of minimum asymmetry effect on trade and production.⁴¹

⁴⁰ Swiss formula means that higher-level tariffs are more reduced than lower-level ones.

⁴¹ For supporting actions not to be due to reduction, the support should be provided through state programs that do not include transfers from consumers. Moreover, such supporting actions shouldn’t concern price support of producers.



“Green” box includes the following groups of supporting actions:

- ✓ general services such as scientific research, education, advisory services, inspection, veterinary and phytosanitary measures, marketing services and infrastructure support;
- ✓ payments that are targeted to support revenues and do not depend on the amount produced, revenue insurance schemes and programs of revenue support, disaster relief programs, retirement schemes and programs on combating resources deterioration, investment support, ecological programs and also programs of regional development;
- ✓ state reserves to ensure food security;
- ✓ food aid.

“Blue” box includes programs on the restriction of products produced. For example, payments in the EU that compensate farmers’ losses from not cultivating some particular part of arable lands are “blue” box measures.

As mentioned above, it would be possible for Ukraine to support its agricultural sector through the “green” box measures, as they would not be subject to reduction.

The amendment “de minimis” includes support of certain kinds of products. Each of them shall not constitute a significant share of the total value of transfers to producers (mainly, less than 5% of production in developed countries and less than 10% of production in developing countries). In developing countries “de minimis” category includes some investment subsidies, such as subsidies used for purchasing agricultural production tools for poor farmers, and also support for cultivation of alternative crops to prevent production of drugs”.

Second category includes measures that are subject to reduction and belong to the so-called “yellow” box. Aggregate Measure of Support (AMS) serves as a benchmark for defining whether the support is to be reduced. This is equal to the total expenditures on the domestic support that is due to reduction aggregated on the whole production range and set of programs. In case of exceeding the allowed amount of AMS, is exceeded by any WTO member, it should reduce expenditures on “yellow” box supporting measures to the level observed prior to the year 2000. Each developed country member of WTO had to reduce its AMS in general by 20% while each developing country member of WTO had to decrease its AMS value by 13.3% by 2005. Ukraine has proposed to apply 1994 to 1996 as a reference period. The use of this reference period leads to an Aggregate Measure of Support (AMS) of \$1.14 bln. However, some members of the working party are insisting on the use of a 2000 to 2002 reference period that would leave Ukraine with an AMS of \$61 mln. Ukrainian officials argue that \$1.14 bln is already a very small amount compared with the support that other countries —



in particular the EU and the US — provide to their agricultural sectors. But empirical research shows that foreign farmers get only 40% of the total subsidies that are allocated to support in agriculture (see Chart 1 and von Cramon-Taubadel, S., Zorya, S. (2004). This will not be desirable for Ukraine if current budget restrictions are taken into account.

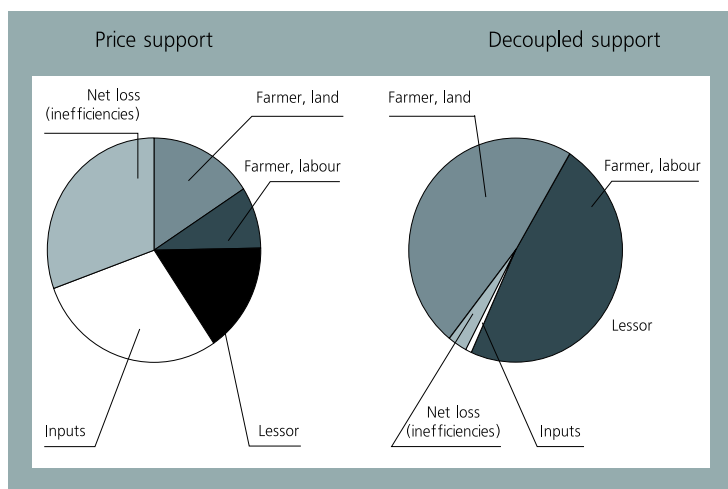


Figure 4.1
 Who benefits from agricultural policy? Price support versus “decoupled” payments

Source: Tangermann (2002).

On the other hand, Ukraine provides the majority of its domestic support in the form of tax exemptions (see Nivyeveskiy, 2006) that are not included in AMS calculations.⁴² Hence, the debate over \$1.14 bln. versus \$0.06 bln. of domestic support is to some extent artificial. Regardless of the amount that is finally bound, tax exemptions will continue to serve as a measure of support. WTO rules require transition from tax advantages to direct budget payments and Ukraine should ensure that any support provided belongs to the “green” box prior to its application.

At the same time, Ukrainian politicians should realize that in the case of successful results of the Doha Round negotiations of the WTO, Ukraine would have to further restrict the size of its “yellow” box, which refers to the amount of AMS (see Table 4.2).

⁴² Though additional benefits of agricultural companies are not considered in the WTO agreements, it does not concern VAT advantages for milk and meat producers in Ukraine. They create unequal conditions for the importers of livestock products into Ukraine that must pay VAT on imports. For further details see Cramon-Taubadel and Zorya (2001).



Table 4.2

Comparative summary of Doha Round offers on agriculture by EU, US and G-20: domestic support

Domestic support	EU	US	G-20
AMS reduction (Amt)	70% for EU 60% for US	83% for AMS over \$25bn	80% for AMS over \$25bn
		60% for AMS \$12bn-25bn	70% for AMS \$15bn-\$25bn
		37% for AMS under \$12bn	60% for AMS under \$15bn
Reduction in overall 1 torting support (Amt Blue + de minimis)	-	75% for total over \$60bn	80% for total over \$60bn
		53% for total \$10bn-\$60bn	75% for total \$10bn-\$60bn
		31% for total under \$10bn	70% for total under \$10bn
Blue Box cap	5% - "but some negotiating flexibility"	2.5%	-
De minimis	65% reduction in current threshold	50% reduction in current threshold	"Reduction" in current thresh- old

Source: Agra Europe Weekly (2005).

Export subsidies

As Ukraine has not applied export subsidies in the past it follows that Ukraine should receive no allowance for the use of export subsidies in the future.

Sanitary and phytosanitary measures

The agreement on sanitary and phytosanitary (SPS) measures reached at the end of the Uruguay Round aims to reduce trade tensions by limiting the use of health and safety measures that often serve as protection mechanisms. The SPS agreement aims to harmonize the SPS measures applied by WTO member countries and ensure that they are both transparent and scientifically sound.

As the procedures used to test for contamination become increasingly sophisticated and sensitive, and as consumers in industrialized countries become increasingly sensitive to food quality issues, there are concerns that SPS measures could lead to a "race to the top" whereby industrialized countries set very high standards that are prohibitively expensive to control and monitor in "small" countries that cannot afford to invest in the required capacities (for example, personnel and laboratories). The result could be non-tariff barriers in the guise of consumer protection.⁴³

⁴³ See Josling (2002) for a discussion of some of these issues. Josling reports that so far the evidence on the use of the SPS dispute settlement mechanism by smaller economies is not encouraging. He reports on 69 cases that have been raised so far by small economies. Of these, roughly two thirds were raised against OECD countries. In only roughly 20% of these 69 cases was the small economy able to reach its objectives. He suggests that small economies should make use of joint representation to pool scarce resources, and that funds be made available to small economies to help them both adopt SPS measures and, when necessary, initiate SPS disputes.

For this reason, “small” countries such as Ukraine have a strong interest in an SPS agreement that ensures transparency and fairness. At the same time, Ukraine should take every possible step to ensure that problems with the quality of its own food exports do not fuel a demand for excessive SPS standards in other countries. While the costs of developing the required SPS infrastructure in Ukraine are high,⁴⁴ they are actually fairly small in comparison with the potential economic value of agricultural trade to the Ukrainian economy. Furthermore, investments in developing SPS capacity would fall into the Green Box category of agricultural support measures; they would represent vital support for the development of Ukrainian agriculture that is not subject to WTO disciplines. Moreover, there is considerable multilateral and bilateral international aid available to countries such as Ukraine for the development of SPS capacity.

This order and restrictions will limit options for Ukrainian agrarian politicians. WTO membership will somewhat decrease the number of instruments that can be used. However, there are the following benefits (see von Cramon-Taubadel, S., Zorya, S. (2004)): WTO membership will stimulate and accelerate Ukrainian agricultural sector reforms and oblige the country to follow stable and transparent agrarian policy. It will positively influence domestic and foreign investments that are especially important for agriculture, as it needs considerable capital investments. As a result, Ukraine as a WTO member will be able to fully use its agrarian potential and improve the entire economy quicker.

WTO membership will provide Ukraine with a voting right in the future debates on international rules of agrarian policy and agricultural trade. Having relative advantages in agriculture and status of a “small” exporter of such important agricultural products as grain and oil seeds (and potentially animal husbandry products). It is Ukraine’s interest to become a member of the Cairns Group. As a Cairns Group member, it would be necessary for Ukraine to adopt and follow the same rules as currently govern international agricultural commodity markets. Cairns Group significantly influenced early agreements on agriculture during the Uruguay Round. Presently, there are many hopes that during the Doha Round of negotiations the Cairns Group would save its strong positions.

Finally, as a member of the WTO, Ukraine will be able to use trade dispute settlement mechanisms. Recent EU decision on grain import quotas illustrates importance of this ability. While EU had to consult with the WTO members, such as Canada and the US, it was not required to consult with Ukraine. As a result, Canada and the US obtained fixed quotas on imports to the EU. But Ukraine was forced to compete with other exporters for remaining quota on the “first come, first sell” basis.

⁴⁴ See the evidence on the costs of the required investments in Schuler (2004).

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Part II: Land Reform and Investments





5. Agricultural Land Market In Ukraine: Allow Or Forbid?

The objective of this chapter, prepared in 2007, is to destroy certain myths on agricultural land markets and to facilitate open public discussion about the necessity of its introduction in Ukraine. The methodology is based on independent experts assessments of opportunities created by a fully-fledged agricultural land market for sector development and improved well-being of rural residents, as well as potential threats that may emerge. Economic, institutional and legal aspects of agricultural land market, such as land lease, are considered. Main issues include the role of land cadastre and registration of land ownership, provision of information on land market transactions, role of the state in exercising monitoring of and control over agricultural land use. Based on a balanced view of negative and positive aspects of free land markets the paper ends with the recommendation to lift the moratorium on land sales.

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Introduction

Since 1991, when independence was declared in Ukraine discussions whether it makes sense to introduce a fully-fledged agricultural land market have been underway. In particular, the possibility of land trading has been actively discussed. The moratorium on purchase and sale of agricultural land was introduced by the current Land Code of Ukraine until January 1, 2005 and then extended until January 1, 2007.⁴⁵ Today the issue of introducing a fully-fledged agricultural land market is being debated again. Much has been said and written in this regard already.⁴⁶ The objective of this article is to destroy certain myths and inaccuracies on the functioning of agricultural land markets and to facilitate open public discussion about the necessity of introducing it in Ukraine. The methodology is based on independent experts assessments of opportunities created by a fully-fledged agricultural land market for sector development and improved well-being of rural residents, as well as potential threats that may emerge.

Economic, institutional and legal aspects of agricultural land market such as land lease, are considered in this paper. The first section reveals the essence of land reform as the key component of improvements in agriculture based on international experience. The issues of agricultural land lease in Ukraine as an important element of land market formation are considered further. Opportunities and threats that may emerge with the introduction of agricultural land market are reviewed in the following section. Next section reveals institutional and legal aspects necessary for agricultural land market formation and functioning. Main issues here include the role of land cadastre and registration of land ownership, provision of information on land market transactions, role of the state in exercising monitoring of and control over agricultural land use. Ideas and recommendations stated in previous sections are summarized.

Does Ukraine need a fully-fledged agricultural land market?

The issues of land ownership and land use were always central in agrarian development and the role of the agricultural sector is decisive in the history of economic development of mankind. Increased productivity and efficiency of the agricultural sector creates opportunities for development of all other sectors of

⁴⁵ Land Code of Ukraine with amendments and alterations introduced by Laws of Ukraine, article 15, Interim Provisions.

⁴⁶ Agricultural land market in Ukraine. German Advisory Group on Economic Reforms with the Ukrainian Government. — Q 4, July 2000; S. Demianenko. Agricultural land market in Ukraine. William Meyers, Sergiy Demianenko, Thomas Johnson, Sergiy Zoria "Changed focus of agrarian policy and rural development in Ukraine: conclusions and progression outlooks". — K.: KNEU, 2005, p. 53—81; N.V. Kalynchuk. One! Two! Three! Land sold... .. APK—Inform, 24.06.02, <http://www.apk-inform.com/>; Pavlo Kulynych. The trap of land moratorium. Legal Weekly, № 2, August 3, 2006.



the economy, especially for the industry. Almost all countries went through phases of land transformation, from ancient Greece in the VI century B.C. to modern land reforms in post-socialist countries at the end of the XX — beginning of the XXI century. Experience of land reforms in different countries shows that usually its major goals were the following: establishment of democracy in the society; mitigating conflicts between land owners and peasants; and creation of small land owners' class.⁴⁷

In this view, land reform should pass have two directions (stages): the first one is to improve living standards for peasants with growth of their income, the second one is to increase land productivity, that is more efficient use of it.⁴⁸

The first stage of the reform, which is land fragmentation and distribution among peasants, had already been completed. Unfortunately, it has not been accompanied by improvement of peasant living standards and growth in their income. However, it was not related to land reform but primarily resulted from transformation processes taken place during establishment of market economy in the country. Next step of land reform should improve productivity of land through its more efficient use facilitated by land markets. This will require the whole set of measures related to overall economic development: In particular, macroeconomic stability and judicial system that secures contract enforcement and market entry for new enterprises.⁴⁹

Thus, the main purpose of the second stage of the land reform in Ukraine is to allocate the land to the most efficient producer. However, today the productivity of Ukrainian agriculture is almost three times lower than in Western Europe and Northern America. If measured by average yield of grain crops and productivity of cows it gives 2.5—3.0 tons per hectare and per cow respectively for Ukraine and 7—8 tons for developed countries. Many studies have been focused on the problem of reducing fertility of Ukrainian black soils and annual losses of humus. In particular, it is noted that in Ukraine annual losses of humus as a result of mineralization and soil erosion reached 32—33 million of tons, which is almost 2 billion US dollars of losses.⁵⁰ Today out of 30 million hectares of arable land one third is eroded, half of it is overconsolidated, almost 4 million hectares are acid, 2 million hectare are solonetzic, not less that 6 million hectares are overdamped, even more droughty land, over 50% of arable land have poor nutrient regime as a result of humus loss.⁵¹ Besides, valuable meliorated land (about 6 million

⁴⁷ Elias H.Tuma (1965). *Twenty-six centuries of agrarian reform. A comparative analysis.* University of California Press, Berkeley and Los Angeles, Cambridge University Press, London, England, p.4.

⁴⁸ *ibid.*, p.240.

⁴⁹ Rozelle, S., J.Swinnen (2004): *Success and failure of reform: Insights from the transition of agriculture.* Journal.

⁵⁰ P.T.Sabluk. *Establishment of agrarian policy in Ukraine.* *Economy of AIC*, № 1, 2006, p.5.

⁵¹ V.Kysil, V.Medvedev. *Land does not excuse miscalculations.* *Agribusiness today*, № 1—2 (087), 2006, p.24—25.



hectares) is being lost — both drained and irrigated, phosphoric soil regime is deteriorating because appropriate fertilizers are not used. Utilization of organic fertilizers as a result of livestock reduction adds to the problem. This is often viewed as the main reason behind inefficient farming. European farmers introduce approximately 40—50 tons of organic fertilizers per hectare together with nutrient elements of mineral fertilizers. Thus, the key task of agrarian reform in Ukraine is to create a land owner who would take care of land like a peasant takes care of his subsidiary plot. That is how Ukrainian farmers appeared as an alternative to collective and soviet farms bringing agriculture back to evolutionary development which has never been interrupted in Europe and North America.⁵²

In most cases international experience proved that private land ownership is the most efficient form of land ownership. With some exceptions due to natural or political factors (e.g. Netherlands or Israel), agriculture in developed countries is based on private land ownership, market economy and a transparent and effective system of property rights protection (laws, judicial system). Unwillingness to implement the second stage of the reforms necessary for introduction of a free land market in Ukraine has often been advocated based on incorrect information on land ownership and use in other countries. In particular, some politicians and economists refer to Israel as a country where State effectively owns land. However, they do not take into account that this country is in the state of war, which is related to some specific territorial problems. The absence of private land ownership there is explained by political rather than economic factors. They also refer to the US where 40% of land is in state ownership but do not specify that it is mostly national parks, forests, mountains and but not agricultural land, 99% of which is in private ownership. Similar statements refer to other countries such as Norway or the Netherlands, without clarification that state ownership of agricultural land in these countries is related to nature. In particular, in the Netherlands the land is below the sea level and the state has to invest significant amounts in construction of dams and other related technologies. Naturally, the land that was won back from the sea is rented out for at least partial compensation of capital investment costs.

One of the World Bank studies reviewed land reforms in post-socialist countries of Eastern and Central Europe. According to this study, Ukraine's ranking is low. It pointed out that evaluation of agricultural land market efficiency should be based on fundamental principles of market economy that can be summarized as

⁵² S.Demianenko. Agrarian reform in Ukraine: genesis, process and outlooks. Theory and practice of AIC development. Materials of international scientific and practical forum. Volume 1. Lviv state agrarian university, Lviv, 2006, p. 223—233.

⁵³ Zvi Lerman, Csaba Csaki and Gersbon Feder. Land Policy and Evolving Farm Structures in Transition Countries. Policy Research Working Paper 2794. The World Bank Development Research Group, Rural Development, February 2002, pp. 79—84.

private land ownership and possibility to buy and sell land freely. The World Bank study was based on these particular principles.⁵³ Program and strategy of land privatization, strategy of land allocation and legislative framework regulating exchange of land ownership rights were evaluated as well. In particular, the evaluation was conducted in the following areas: a) transfer of agricultural land into private ownership of citizens by means of restitution of land or its allocation to those people who work on it; b) possibility to buy and sell or only to lease land; c) current legislative framework for exchange of ownership rights in land; d) land privatization by means of issuance of land certificates or land titles. Respective coefficients and cumulative comprehensive index of land policy were determined for the purpose of evaluation. The aggregate of countries under review included: Azerbaijan, Albania, Belarus, Bulgaria, Armenia, Georgia, Estonia, Latvia, Lithuania, Kazakhstan, Moldova, Kyrgyzstan, Russia, Romania, Poland, Tajikistan, Turkmenistan, Czech Republic, Slovakia, Ukraine, Hungary and Uzbekistan. The highest index value (10) was assigned to Hungary and Romania and the lowest — to Uzbekistan and Belarus (0.6 and 1.3 accordingly). Ukraine was ranked 15th among 22 countries reviewed with the aggregate index of 6.7. This may contribute to low investments in land. Foreign direct investments in Ukrainian agriculture as of 01.01.2004 came to only USD 4.3 per hectare, compared to USD 35.4 in Slovenia, USD 42.7 in the Czech Republic, USD 53.3 in Latvia and USD 69.8 in Estonia per hectare. Agricultural land market exists in all of these countries and in Latvia and Estonia foreigners have free access to land purchase.⁵⁴

Comparing land reform and land market development for a quite significant set of countries with that for Ukraine made form this study, suggests that Ukraine has to speed up reforms towards competitive agricultural land market. Delayed land reform in Ukraine impedes agrarian reform, prevents market mechanisms to stimulate agricultural development and attraction of investments.

Currently political rather than economic reasons undermine reforms in agriculture, in particular, the moratorium on agricultural land sale. However, having completed some initial reforms it is unlikely to be possible to stop at this stage. Land market that is based exclusively on its leasing without procuring into private ownership cannot create an adequate landowner, which was one of the major goals of agrarian reform. Moreover, we believe that in the future foreigners should also have the right to buy land.⁵⁵ This would contribute to development of land relations and European integration of Ukraine. Certain legislative restrictions must exist, in particular, priority rights of Ukrainian citizens, first of all,

⁵⁴ A.P. Haidutsky, Investment attractiveness of land market in Ukraine. *Economy of AIC*, № 8, 2005, p.125—131.

⁵⁵ S.I. Demianenko. Mortgage lending on the collateral of agricultural land: German experience and possibility of applying in Ukraine. *Economy of AIC*, №10, 2002; S. Demianenko. Agricultural land market in Ukraine. Meyers, William, et al. (eds) "Refocusing Agricultural and Rural Development Policies in Ukraine: Action Plan for the Road Ahead. Washington, DC: USAID, 2005, p.61.

those who reside in rural areas and work in agriculture. For instance, Ukraine could use the Polish approach to legislative regulation of agricultural land purchase and sales by foreigners as an example.⁵⁶

Agricultural land lease

A viable agricultural land market should consist of two parts — land purchase and sales market and land lease market. Without a lease component the general principle of land transfer from inefficient producers to efficient ones would not work.

Today, agricultural production in Ukraine is based on land lease mostly. However, the owners and the state do not control its use. There are no agrochemical laboratories necessary for evaluation of soil state and fertility before and after the lease period, so these indicators are not fixed in lease contracts. As a result, no sanctions are applied to careless tenants that damage land as a result of their activities. Table 5.1 contains information about agricultural land lease in Ukraine as of 01.01.06. Out of 22.9 million hectares of agricultural land operated by agricultural farms 19.9 million hectares, or 88.1%, were rented. Experience in other countries shows that purchase and sale of land is not the main element of land market. According to Lermon, Csaki and Feder,⁵⁷ transparency and security of land lease transactions are even more important for ensuring productivity and efficiency of agrarian production than legal land ownership. Experience of developed countries demonstrates that in these countries significant parts of agricultural producers are not owners of land but lessees. In particular, in Belgium, France and Germany over 60% of agricultural land is leased, and in 15 EU countries on the whole — 40%, in Canada — 30%, in the US only one third of cultivated land is owned by the farmers, 55% of land is in mixed form of use and 10% of land is used by the farmers who do not own it.

Agriculture productivity and efficiency also depend on the area of land cultivated by a single agricultural producer. In European countries with efficient land markets, clear and transparent rules of land use (lease) farmers have average farm area of 40 hectares (for farmers who lease more than 30% of arrears they cultivate) and 18 hectares on average (for farmers who rent less than 30% of land they have). Similar trends are observed in other countries as well.⁵⁸ In Ukraine, a paradoxical situation is observed when tenant companies emerge that rent dozens and even hundreds of thousands hectares of land. This is does not benefit

⁵⁶ A.M.Tretiak. Ways of land market regulation. Herald of agrarian science, № 10, 2003, p.62—65.

⁵⁷ Zvi Lermon, Csaba Csaki and Gersbon Feder. Land Policy and Evolving Farm Structures in Transition Countries. Policy Research Working Paper 2794. The World Bank Development Research Group, Rural Development, February 2002, p. 64—66.

⁵⁸ Zvi Lermon, Csaba Csaki and Gersbon Feder. Land Policy and Evolving Farm Structures in Transition Countries. Policy Research Working Paper 2794. The World Bank Development Research Group, Rural Development, February 2002, p. 66.

agricultural land market development as it strengthens existing monopsony in Ukraine.⁵⁹ It also impedes the development of farming in Ukraine because farmers cannot compete with large tenant companies. At the same time it is the farmers who are interested in development of rural territories where they live together with their families. Large tenant companies may quit agrarian business if conditions (e.g. taxation) are unfavorable.

Table 5.1
*Agricultural land lease by farms in Ukraine (as of 1.01.06)**

Indicator	Total	including:		
		Agricultural enterprises	Private family farms	Private farms*
Total area of land, thou hectares	22588.3	10877.2	3861	7634
Including leased, thou hectares	19908.3	10362.4	3779	3241
Leased land, %	88.1	95.3	97.9	42.5
Leased land owned by pensioners, %	52.0			
Number of lease contracts, thou	4560.1	2371.7	885.7	615.6
Breakdown by lease term, %:				
1-3 years	10.0			
4-5 years	62.2			
5-10 years	14.7			
Over 10 years	3.6			
Number of founders, people	269028	141215	6822	44312
Number of founders per one farm, people	12.7	18.0	1.9	1.0
Area of land belonging to founders of farms, thou hectares	5071	406	29.5	4393
Average land share of a farm founder, hectares	5.2	2.9	4.3	10.0
Number of farms	57877	7849	3643	44312
Number of individuals entitled to get land shares, people	6913495	X	X	X
Number of individuals who got land shares, people	6794999	X	X	X
Registered transfers of land share title, total number	1052639			
Including by way of (%):				
inheritance	89.5			
gift	9.0			
sale	1.3			
exchange	0.2			
Number of issued land titles	5673168	X	X	X
Issued land titles to land certificates, %	83.5	X	X	X
Accrued according to lease contracts, thou UAH	2275514	X	X	X
Actual rent per one hectare, UAH	114.30	X	X	X
Cash portion of rent, %	14	X	X	X
In-kind portion of rent, %	80	X	X	X
Services portion of rent, %	6	x	x	X

Sources: Statistic handbook "Agricultural sector of Ukraine 2005", State Statistics Committee of Ukraine — Kyiv, 2006.; Structure of 50 farms for 2005; Current information of the Ministry of Agrarian Policy and State Committee of Ukraine for Land Resources, own calculations.

* Category "private farms" includes also registered farms established on the basis of former collective agricultural enterprises.

Today in Ukraine only the level of rent paid by the tenants to landowners can serve as an indicator that would allow calculating approximate land market value. In 2005 average rent per one hectare of agricultural land was about UAH 114 and average credit interest rate was 16.2% (in the absence of mortgage and long-term lending), and annual inflation rate was 10.3%. Based on these indicators a simple calculation shows that the present value of one hectare of land will be about UAH 2000 ($114 / (0,162 - 0,103)$).⁶⁰ This is an average figure. Actual values would be specific for each location. For example, in Odessa, where farmers specialize in vegetable growing and land is quite productive, rent reaches UAH 1000 per one hectare of arable land, so the price of land here is about UAH 17,000/hectare.

The level of competition is an important element of the agricultural land leasing market. Studies on the influence of competition on the level of rent payments demonstrate that with development of competition in the lease market the level of rent payments increases significantly (about 50% in all oblasts of Ukraine). The maximum level of rent payments is 2.5 times higher than its minimum level.⁶¹

Another important factor that influences the level of rent and land price accordingly are transaction costs associated with leasing agreements. They include costs related to land search contracting, notary fees, etc. The amount of these transaction costs depends on various conditions at land lease markets, infrastructure development, availability of information about land plots for rent, and network of notary offices. The lower the development level of lease markets, the higher are the transaction costs associated with lease contracts and the lower is the rent. Other factors such as unstable Ukrainian legislation, lack of market infrastructure, high interest rates for short-term credits and crop insurance, further decreases the level of rent for agricultural land. Risks that emerge in the course of rent relations contribute to this and reduce lessee's income. For comparison, agricultural land lease rent rate in Ukraine is about 18—20 times lower than in the European Union.

⁵⁹ S. Demianenko. Agricultural land market in Ukraine. Meyers, William, et al. (eds) "Refocusing Agricultural and Rural Development Policies in Ukraine: Action Plan for the Road Ahead." Washington, DC: USAID, 2005 p. 67.

⁶⁰ Calculations were made based on Present Value estimation of future rent payments flows. Assuming endless period and constant each period rent payments we end up with simple formula for present value of perpetuity: $PV = C / r$ (see Ross-Westferfield-Jaffe, 2002, page 82). Normative pecuniary evaluation of land in Ukraine as of 1.01.06 is UAH 9526.

⁶¹ Arnim Kuhn, Sergiy Demianenko. Ensuring competition in land lease market. Ukrainian agriculture: crisis and recovery / Edited by Stephan von Cramon-Taubadel, Sergiy Demianenko and Arnim Kuhn. — K.: KNEU, 2004. — p. 84—92.

Opportunities and challenges arising from a fully functional agricultural land market

Increasing land fertility and investments in the land are critical for agrarian sector to improve its productivity and efficiency. Experience of developed countries shows that a fully-fledged agricultural land market is a necessary condition for that. History proves that private land ownership and market economy are effective when one is to ensure increased land fertility. Collective and soviet farms appeared to be incapable of solving this task of necessary level of land productivity (despite of significant capital investments in agriculture its productivity in the Soviet Union was permanently lower than in developed capitalist countries and grain and food products had been imported regularly from 1963). Thus, reversal to private farming was put as a main objective of the reforms in the agriculture in the background of agricultural land as a part of the market mechanism with its value determined by a number of economic factors such as inflation rate, credit interest rates, prices of agricultural products and inputs, profit per hectare, and possibility of unhindered land transactions (purchase/sale and lease). On the other hand, the listed economic factors also depend on the land value which determines the possibility of lending to farms and allocation of primary manufacturing resources. Therefore, the development of productive and competitive agriculture requires a fully functional agricultural land market.⁶²

Taking into account that the current moratorium on purchase and sale of land is the major impediment to the introduction of a fully-fledged agricultural land market, an attempt was made to determine potential consequences of its cancellation or prolongation, which are summarized in Table 5.2. Cancellation of the moratorium and introduction of a fully-fledged agricultural land market will facilitate fast approval of required legislation ensuring proper and legal land transactions, while continuing land moratorium would preserve shadow land market. The legislation has not been passed by Verkhovna Rada of Ukraine during five years after passing the current Land Code of Ukraine. With fully-fledged agricultural land market, land value will most likely to increase due to establishment of transparent sale schemes. Improved efficiency of agriculture will contribute to increasing value of land as well. However, if the moratorium is continued, the growth of land value will be decelerated artificially, impacting negatively the peasants' income from land sales that would take place under shadow schemes otherwise. Today several schemes are applied in Ukraine to acquire agricultural land: via lease contracts with buyout after moratorium cancellation; issuance of certificates authorizing other persons to obtain land; making preliminary contracts according to

⁶² Agricultural land market in Ukraine. German Advisory Group on Economic Reform with the Ukrainian Government. — Q 4, July 2001.

article 635 of Civil Code of Ukraine for transfer of land right in the future.⁶³ Transferring commodity agricultural land to the category of land for individual farming is becoming widespread as well. This is done because it is easier to transfer land for individual farming into other land categories, in particular, to take it out of agricultural land category and to use it for a different purpose such as community development. This scheme became most widespread in Kyiv oblast, where private house construction around Kyiv has been booming.⁶⁴

Obtaining mortgage loans using land as a collateral is an important element of agricultural land market. It is unlikely that at the initial stage of agricultural land market development this type of lending will become widespread, because only founders of agricultural enterprises and farmers that own the land will be able to use land as collateral. There is approximately 5 million hectares of such land in Ukraine (Table 5.1). However, mortgage lending based on land collateral will develop rapidly and facilitate access to long-term credit resources for Ukrainian agriculture.

The agricultural land market will create conditions for redistribution of land and creation of larger and more efficient farms, it will also facilitate growth of rent.⁶⁵ At the same time, in a functioning land market people who wish to sell their land, in particular pensioners who are not able to cultivate it and have no heirs, will have an opportunity to get significant amounts to their family budgets. According to the State Committee of Ukraine for Land Resources, in early 2006 24 thousand elderly land owners with no heirs have already died and their land was transferred to state ownership.⁶⁶ This can be hardly considered fair. About 15% of landowners are single pensioners without heirs and 30% of landowners live in cities (usually they are legal successors (children) of peasants landowners). Generally, 52% of leased out land belong to pensioners (Table 5.1). In addition, there is an increasing number of cases when people return their land shares to the state because they do not see the prospects of its further use. They claim that as landowners they do not get state subsidies for compensation of utility costs, they do not have money to receive land titles and nobody wants to lease their land. It should be noted that not all citizens who were entitled to get land certificates really obtained them in reality, and the number of people who will get land titles is even smaller (Table 5.1). Concentration of land in the hands of efficient landowners will ensure its higher productivity, efficiency and fertility. Increased levels of

⁶³ P.F.Kulynych. Regulation of agricultural land market: ideas and draft laws. Land law of Ukraine, № 3, 2006, p.41—42.

⁶⁴ Natalia Boguta, Svetlana Slesarchuk. Black soil in the black market Expert-Ukraina, № 10, October 16—22, 2006, p.58—64.

⁶⁵ Agricultural land market in Ukraine. German Advisory Group on Economic Reform with the Ukrainian Government. — Q 4, July 2001.

⁶⁶ Pavlo Kulynych. The trap of land moratorium. Legal Weekly, № 2, August 3, 2006.

land value and rent will lead to creation of rational areas of landholdings including proprietary and leased land.

As a result, labor productivity in agriculture will increase, the total number of people working in the sector will be reduced and income levels of those who will continue working there will increase (farmers, wage earners, owners, managers and specialists working at large farms). This will stimulate emerging of middle class in rural areas and increase revenues of local budgets. On the other hand, reduction in agricultural labor will accelerate migration from rural areas. However, it is not a negative phenomenon because unemployment rates among rural population are high, rural economic development is low and it is necessary to develop non-agricultural activities in rural areas. It has to be accompanied by appropriate institutional changes from Silska Rada (village council) to the national level. If the moratorium on purchase and sale of agricultural land is prolonged it will preserve farming on rented land mostly. In addition, hidden unemployment in rural areas, small-scale commodity agricultural production, a lack of institutional and structural changes in the sector, a slow development of non-agricultural business activities, rural areas and local self-government will prevail in the future. Another negative aspect of the moratorium is that the state does not control transactions with agricultural land, which leads to illegal activities with the land.

Table 5.2

Potential consequences of cancellation or prolongation of moratorium on purchase and sale of agricultural land

Cancellation of moratorium and implementation of a fully-fledged agricultural land market	Prolongation of moratorium
Accelerated enactment of necessary legislative acts and ensured stable and legitimate land use	Delayed enactment of necessary legislative acts, preservation of agricultural land black market and speculative land trading
Increased value of land and its capitalization	Low value of land and losses of peasants related to existing shadow schemes of land sales and low land price
Mortgage lending based on land collateral is possible	Mortgage lending based on land collateral is impossible
Redistribution of land to more efficient producers, increased rent	Small agribusinesses, large-scale land lease and low rent rates prevail
Elderly people who have no heirs will have an opportunity to sell their land and get significant funds	Elderly people who have no heirs do not have an opportunity to sell their land and get significant income
Increased productivity and efficiency of land use by efficient landowners	Farming takes place mostly on leased land, reduced soil fertility and humus loss
Reduced number of people working in agriculture due to increased labor productivity, creation of middle class in rural areas	Preserved hidden unemployment in rural areas and migration of peasants
Institutional and structural changes in agrarian sector	Existing agrarian structure remains
Stimulated development of non-agricultural activities in rural areas, rural economy in general and rural communities	Small-scale farming and stagnant development of rural economy and local self-governance

At the same time, it is also necessary to take into account potential threats that may emerge with the introduction of a fully-fledged agricultural land market and to apply appropriate measures to mitigate these threats. The possibility of significant concentration of land in the hands of a few individuals or land holdings is one of such threats. Formally, there is a provision in the Land Code of Ukraine, which is intended to mitigate this threat. It states that that maximum area of agricultural land owned by individuals or legal entities may not exceed 100 hectares until January 1, 2010 (paragraph 13, section X of Interim Provisions). However, in our view it is necessary to have a permanent provision restricting the area of agricultural land in private ownership. The exact level of this restriction — 100, 500 or 1000 hectares or percentage of land that can be owned by one person within a particular territory — has to be established for each region taking into account the area of land available in a particular region, because the level of land supply and the farming conditions are significantly different in, say, Transcarpathian and Kherson oblasts.

Another threat could be confiscation of land by creditors in case when loans based on land collateral are not returned. However, international experience shows that in practice such cases are rare. In fact, banks do not need the land but

only the money income. This is possible only in case of efficient land use, i.e. by applying modern production and management technologies. Therefore, banks will lend to those that show progress and potential to pay back. Confiscation and reselling is an extreme case.

The list of threats may also include a foregone income on land people who will sell. Therefore, peasants that own the land have to be informed about a true value of land and future opportunities so that their decisions are based on correct and complete information.

Institutional and legal aspects of agricultural land market formation and functioning

In order to complete the privatization and to ensure proper land market operation in the future appropriate institutional framework needs to be developed in Ukraine. It would establish the rules of land trade and ownership. Essential aspects of this institutional program must be as follows: a) cadastral monitoring; b) planned use of land resources according to respective legislation; c) registration of land property rights; d) registration of pledges and other obligations related to land ownership; e) resolution of conflicts; and f) land mortgage.

Legislative framework that regulates land market in Ukraine consists of the Civil Code of Ukraine and the Land Code of Ukraine. This legislative framework is sufficient for non-agricultural land market operation. However, agricultural land market requires a separate legislative framework. Therefore, the laws of Ukraine "On State Land Cadastre" and "On Land Market" should be passed as soon as possible. The purpose of the latter is to ensure that initial transactions with agricultural land are legal, protect peasant land ownership rights, and also prevent monopoly or oligopoly on agricultural land market.

It is necessary to distinguish between two important aspects — cadastre and registry of land parcels. The purpose of a cadastre is to provide description of physical characteristics of land parcels. It consists of map and registry of land parcels where these characteristics are recorded. Today Geographic Information System (GIS) is used for cadastre purposes. A registry of land parcels is created for the description of legal status of a land parcel. It means that former and current owners of a particular land parcel are recorded. Other rights are recorded as well, for example, the right to use a road passing through the land parcel. Pledges are also registered in the registry.

Information contained in cadastre may be reflected in the registry of land parcels and vice versa. For instance, the owner of a land parcel is in the cadastre but the registry contains the information that describes the legal status of a land parcel. The registry may also contain copies of maps and descriptive parts of the cadas-

tre. However, it is the registry and not the cadastre of land parcels that confirms property and other land rights of a particular owner.

The institutional framework of these two elements may have different forms depending on traditions and importance of certain constitutional and legal principles. However, the form of the land market institutional framework is not purely a legal issue; it has important economic consequences for rural development.

First of all, it is necessary to ensure efficient and transparent exchanges of ownership rights. In many countries with poorly functioning institutional arrangements capital owners suffer from excessive bureaucracy. Opening new businesses, filing applications for credit or property sales always require a large numbers of civil servants, bribes, and other expenses which can sometimes be equal to annual income and take much time. Procedures and contracts associated with land transactions have to be as simple as possible to ensure efficient land market operation.

Guarantee of land ownership rights and its reliability is another important aspect. If a landowner cannot prove (confirm) his right for a land parcel in a quick and reliable way, it will be difficult for him to sell, lease or to use it as collateral. A lack of ownership rights' guarantee will lead to increased transaction costs, which will lead to reduced value of land. Ironically, one of the reasons of imposing the moratorium on land sales was that Ukrainian politicians were concerned about low prices of land. If the state is a broker and a landowner at the same time property rights will be unreliable in the absence of control from judicial structures thanks to conflict of interest.

While on the one hand the system will be the most efficient if monitoring of land relations is performed by one organization, on the other hand guarantee and reliability of ownership right are better assured if several constitutional bodies are involved. A compromise can be found if we take into account that checks and balances require not a direct interference of all constitutional bodies but just a mutual control. Finally, guaranteed right of individuals to challenge administrative decisions in the court is an efficient way of exercising control over misuse of authority.⁶⁷

After enactment of the new Land Code of Ukraine at the end of 2001 disputes occurred between the Ministry of Justice and the State Committee of Ukraine for Land Resources as to which entity will do registration of land property rights. These discussions had not been finished during the last several years.⁶⁸ While there are advantages of having a single body doing cadastre and registration,

⁶⁷ Institutional aspects of land market development in Ukraine. Institute for Economic Research and Policy Consulting, German Advisory Group on Economic Reform with the Ukrainian Government. — T. December 17, 2003.

this approach was criticized and proposals were made to share the authority between two organizations. In 2006 the Cabinet of Ministers of Ukraine issued two resolutions: "On separation of land cadastre's functions from state registry of rights on land and non-land property" dated 16.05.06 and "On transfer of state enterprise "State land cadastre center" from the State Committee of Ukraine for Land Resources to the Ministry of Justice" dated 26.05.06 # 295—p. However, implementation of these resolutions requires amendments to the Law of Ukraine "On State Registry of Property Rights in Real Estate and their Restrictions" in part of assigning functions of the state registry to the Ministry of Justice.

Conclusions

1. Agricultural land market is an internal part of market relations and a tool to improve efficiency in agriculture. This is proven by a long history of agrarian development in many countries. Agrarian and land reform implemented in Ukraine in late the XX century was conducted specifically for the purpose to improve land use, to increase its fertility and productivity. That is why emergence of a fully functional agricultural land market should logically result from the land reform.
2. Moratorium on agricultural land sales in Ukraine is based on political rather than economic reasons. From an economic standpoint, the moratorium is harmful. It does not prevent agricultural land trading but creates shadow markets. As a result, losses are incurred by: peasants landowners who receive much lower price for their land compared to open market conditions; local state authorities and local budgets due to loss in taxes payments levied on agricultural land transactions; agricultural producers and agrarian production in general, because it is not possible to use land as an economics resource fully and obtain loans.
3. In the absence of transparent agricultural land market several schemes exist in Ukraine for shadow alienation of agricultural land: making lease contracts with buyout after moratorium cancellation; issuance of agreements authorizing third parties to acquire land; making preliminary contracts according to article 635 of Civil Code of Ukraine for transfer of right for land alienation in the future. It is also becoming more popular transferring commodity agricultural land into individual farming land. This happens because it is easier to transfer individual farming land into other land categories. In particular, taking it out of agricultural land category and use it for a different purpose, such as for communal and construction land.

⁶⁸ Institutional aspects of land market development in Ukraine. Institute for Economic Research and Policy Consulting. German Advisory Group on Economic Reform with the Ukrainian Government. — T. December 17, 2003; S. Demianenko. Agricultural land market in Ukraine. Meyers, William, et al. (eds) "Refocusing Agricultural and Rural Development Policies in Ukraine: Action Plan for the Road Ahead. Washington, DC: USAID, 2005, p.70.

4. The moratorium for agricultural land sales violates the constitutional rights of peasants- landowners to use their land freely. There is an increasing number of pensioners died having no heirs and died and their land was transferred to state ownership. The share of this category of peasants-landowners is 15%. There are also an increasing number of cases when people return their land plots to the state because they do not see the prospects of its further use. One of their explanations is that as landowners they do not receive state subsidies for compensation of utility costs, they have no money to receive land titles and nobody wants to lease their land.

5. Agricultural land leasing is an important market element. Farms rent over 88% of land that they cultivate. However, in the absence of a fully functional agricultural land market the level of rent is low reaching about UAH 114 per hectare. Only 14% of this amount is paid in cash and the remaining 86% is paid in kind and services. The low level of rent leads to low land prices. Besides, certain parcels of agricultural land are not used at all due to no lessee demand. Another extreme is lessees that rent dozens of thousands of hectares of land all over Ukraine. It hampers the development of farming, as farmers cannot compete with large corporate lessees.

6. Along with the cancellation of the moratorium for agricultural land sales, institutional and legal framework for land market regulation needs to be established. Passing the laws of Ukraine "On State Land Cadastre" and "On Land Market" is urgent. The purpose of the latter is to first of all provide the legal mechanism for initial distribution of agricultural land parcels, to protect peasant landowners' rights, and to prevent land monopolies and very large farms.

7. The state must ensure: establishment of a unified system for registration of land ownership rights and legal integrity of land parcel with buildings, plantings and other property located on it; monitoring of land cadastre; access to electronic information on land available for rent and sale for all that wish to get this information. Besides, the state must facilitate the establishment of system a monitoring to control of land use, particularly soil composition and fertility before and after lease term, exercised by state or private laboratories. Efforts of the state, judicial system, politicians and NGOs need to be focused on compliance with current land legislation, namely Constitution of Ukraine, Land Code, law of Ukraine and other regulatory documents.

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6. Legal and Institutional Aspects of Agricultural Land Markets in Ukraine

This paper requested by the Ukrainian State Land Committee and the Secretariat of the President was prepared in 2007. Although Ukraine decided to set up a multi-functional land cadastre and European-style state registry of rights to immovable property as a unified system years ago, public administration institutions are still debating whether unification of the cadastre and registry is viable. In this paper we are arguing that this is not the key-point for success and advising on necessary elements and provisions of cadastral and registration system, which are recognized by many national governments and international organizations as essential for effective functioning of the system whatever design it has. This paper shows that political choices on the establishment and organization of a cadastre and registration system shall be based on desirable features of the system: expediency, reliability, cost effectiveness and security

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Introduction

Since the declaration of private ownership on land the topic of land market have been discussed heavily. The Land Code of 2001 establishing principal legal foundations of the land market has not been applied due to agricultural land sales moratorium, which was approved simultaneously with the adoption of the Code. The moratorium was originally valid until January 1, 2005, but was prolonged to January 1, 2007⁶⁹ and then to January 1, 2008. Results of the Parliamentary elections of 2002 and 2006 consistently showing Communists and Socialists losing popular support which opened a possibility of fully-functioning land markets.⁷⁰ Therefore, during the last year of the moratorium it is the time to make major political decisions with respect of the organization of land markets that need not only permission to operate but also very strong legal and institutional infrastructure.

Ukrainian experience of transition proves that any reform that depends on human factors is highly exposed to additional risks. Therefore, the establishment of a land market system with a well-balanced institutions and adequate and stable legal regime is a task of utmost importance. Such system lies at heart of a successful land market which in turn is a corner stone of the national economy.

The goal of this paper is to contribute to the discussion on the agricultural land market in Ukraine as a key issue of market transformation. We will perform an independent analysis of institutional and legal aspects related to operation of land markets and develop specific recommendations for immediate action.

Major functions of a cadastre and land registration system

Purpose of a multi-functional cadastre and land registration system

Significance of land in the modern world is extremely high. Land is an “ultimate source of wealth” and at the same time it is a limited resource. Thus, special attention should be paid to it.⁷¹

Land market in developed countries insured high GDP growth and prosperity. According to United Nations Economic Commission for Europe (UN ECE), at least 20% of GDP of developed countries originate from the land market (and it is an internal part of the real estate market).⁷²

⁶⁹ In fact, there was a brief period between December 31, 2006 and January 13, 2007 when the moratorium was not in force.

⁷⁰ About continuous legislative attempts of these parties in respect of further prolongation of the moratorium see section “Center’s comments to draft laws” at www.myland.org.ua.

⁷¹ Land Administration in the UNECE Region. Development Trends and Main Principles. ECE/HBP/140. — Geneva: UN, 2005. — p.29.

⁷² M. Fedorchenko, O. Yanov et al. Ukraine: Effective Land Resources management at the Local Level. — Kyiv: Center for Land Reform Policy in Ukraine, 2005. — p.244.

Land is a complex phenomenon and has many properties: it is an part of a physical world, territorial basis for human activities, economic asset and factor of production, object of different rights, factor of spiritual life of the nation and factor of national unity.

Land (urban, rural) and real estate as it internal part have high economic values. This value is used only if land is a commodity tradable on the land market, first of all as collateral for loans and credits. Use of land as commodity requires formalization of land property rights.

Importance of land property rights is best explained by the economist Hernando de Soto (Peru). In his book "Mistery of capital — why capitalism works in the West and nowhere else" he predicted that in the next 150 years 25 most developed countries would probably be joined by those developing and transition countries that exert efforts to create better property rights systems protected by the law, rather than by those continuing to focus on the protection of domestic industries using outdated economic policies.

This position is supported by the idea that real estate is a dead capital if it is not on the market. Countries in transition which privatized housing facilities, state enterprises, land resources but failed to establish a functional system of property rights, in fact put out of economic relations assets worth billions of dollars. It hampers investments and makes the state support minimal living standards of its citizens by subsidizing them from the state budget. The state has to apply unfavorable for business taxation policy, which enhances shadow economy and drain of capital to place with more favorable conditions. This type of economy is very risky and grows at a lower rate. Growth of the economy usually is significant in sectors that are least controlled by the state (first of all, in all shadow sectors). Thus the state cannot tax the shadow activities and has to put pressure on legal sectors of the economy. These developments do not lead towards improvement of living standards, as the state is incapable of redistributing GDP through the state budget. Moreover, this restricts the use of real estate possessed by virtually every citizen (an apartment, a house, a land parcel), limits consumption and slows the development of small and medium businesses which are very important sources of the national wealth accumulation. According to unofficial data of one of Ukrainian leading industrial and financial groups, its spending for taxes is not exceeding 1% of its turnover, because there are opportunities to minimize taxes within the group. Small and medium enterprises do not have such opportunities; therefore their role in forming welfare of citizens is more significant.

The position of de Soto is viewed as correct now and shared by many national governments and international organizations considering it a key instrument for economic flourishing and effective poverty alleviation. Thus, at the first, sec-

ond and third forums of the Real estate Advisory Group of UN ECE (UNECE REAG) in Rome this position was strongly supported by representatives of European countries, and UN created a special group of advisors “On Legal Empowerment of the Poor” was created which would help developing countries to set up property rights systems. The UN itself in its Bogor declaration of 1996 stressed that “formalization of rights in land, which are an integral component of an effective cadastral system, is very important for sustainable economic development and environmental management in both urban and rural areas”.

A property rights system consists of the following elements: means of identification and description of land and real estate (cadastre); means of formalization (confirmation, attestation) of rights to land and real estate (registry of rights); instruments for circulation of rights (land market or real estate market); financial institutions and financial instruments (banks, credit unions, mortgages and mortgage bonds); dispute resolution bodies (judicial system).

Two elements are of crucial importance — cadastre and registry of rights, because these very elements allow for conversion of land into capital suitable for market circulation. In transition countries these elements are either absent or underdeveloped. However, land markets without cadastre and registry cannot operate, because it is important to trade quickly, and land circulation is done through the exchange of rights. Courts, in turn, cannot protect rights that may be claimed by unlimited number of persons.

The content of the cadastre depends upon its purpose (i.e. what aspect or aspects of land it describes). Historically, cadastres appeared in ancient societies more than 2000 years ago, mostly as instruments of fiscal policies and registration of land transactions.⁷³ Functions of the cadastre have been developing along with the society itself. This development resulted in the establishment of two inter-related instruments of land resources management: land (real estate) cadastre and registry of rights.

Cadastres are mostly focusing on physical properties of land parcels (shape, area, coordinates, measurements, boundaries, quality of soil, monetary valuation, pollution, existing buildings, water objects, perennial plantings), while registries of right focus on legal characteristics of land (rights to parcel, private and public encumbrances, claims of third parties).⁷⁴

It is clear that cadastre and registry describe one and the same object; therefore,

⁷³ International federation of Surveyors (FIG). The FIG statement on the cadastre. Frederiksberg, Denmark, FIG Office, 1995. Publication No.11/1995; Cadastre—2014. Point 1.1.C. FIG; Larsson, G. Land Registration and Cadastral Systems: Tools for land information and management. Longman Scientific and Technical, Essex, England, 1991. ISBN 0—582—08952—2.

⁷⁴ Guidelines on Real Property Units and Identifiers. — New York and Geneva, UN, 2004. — p.2.

these two systems may hold certain identical information on land parcels (cadastral number, name of the owner and the parcel scheme). At the same time cadastre shall cover the whole territory of the state,⁷⁵ and registry may contain information about objects which are or can potentially be on the market (state lands, land exempt from circulation may be not registered; the fact that they are not registered prevents them from being traded).

In some cases cadastre and registry are unified, in other cases they are working separately and controlled by different institutions. In Sweden, Finland, Italy, the Netherlands, Cyprus, Czech Republic, Georgia cadastre and registry are united into a single system (unified system), while in Austria, Croatia, Denmark, France, Germany, Greece and Ireland cadastre and registry are divided between different institutions (two-tier system). Romania, Norway, Iceland are currently uniting cadastre and registry under a single body. Ukraine has been trying to set up a unified system, which undertaking was unsuccessful, and currently is trying to switch to a two-tier system.

At the same time cadastre and registry have principal differences. Cadastre describes a material object — a land parcel (and attached to it buildings, plants, waters etc). Critical parameters listed in cadastre are location (coordinates, address) and boundaries. Separation of an object out of all others is done with the help of different identifiers (name, number, index) which are unique and inimitable and prevent mixing up of different objects.⁷⁶ Thus cadastre is a data base holding description of real estate objects and identifying every object with a special number (index).

The phenomenon of property right to land has a consequence that all real estate objects, including land, buildings, plantations, have one very important attribute making similar objects very different. It is the fact of belonging to a certain person. It is possible to say that existence of rights of different persons to certain parts of Earth's surface makes it necessary to single out separate parcels of massive of land. Rights of different persons make legal boundaries of parcels; these boundaries have crucial importance for the market economy where the economic development depends on economic effects of exchange of rights. To give this phenomenon a proper shape a registration system is employed.

A registration system is fixing diverse legal rights in respect of objects described in the cadastre, i.e. it focuses on the legal side of real estate. First of all, the system registers property right; afterwards the system collects data about rights of lower level (servitudes, mortgages, leaseholds) as well as about transfers and change of rights.

These two systems may run in parallel but absence of either one (or both) makes

⁷⁵ Cadastre—2014. FIG.

⁷⁶ Guidelines on Real Property Units and Identifiers. — New York and Geneva, UN, 2004.

the functioning of land markets impossible. The cadastre provides for the certainty in respect of what object is transacted, and the registration system provides for the certainty in respect of the authority of a person to transact.

So, cadastre defines physical (real) boundaries of real estate of different owners, and the registration system defines legal boundaries thereof. According to professor Jo Henssen, cadastre answers questions “where” and “how much” property is, and registry answers questions “who” and “on basis of what” owns that property.⁷⁷

In the modern world there is a tendency to compile in cadastres diverse data for additional tasks. Such cadastres are called multi-functional,⁷⁸ i.e. their information is used for the purposes of land management, control of land use, taxation, valuation, consolidation, spatial planning, environmental monitoring etc. Accordingly, cadastre is enriched with new attributes of land and may be applied to new problems. Moreover, collection of diverse data within the framework of one parcel-based system allows for better administration of data and cheaper operation and maintenance of the system. Multi-functional cadastral and registration systems create new possibilities and opportunities for raising importance and value of land-related data on account of processing thereof, it also provide for broad application of data on domestic and international markets.⁷⁹

This multi-functional approach is also adopted in Ukraine, because data of land cadastre is a basis for cadastres of other natural resources.⁸⁰

There are examples of narrowing of functions of cadastre to merely fiscal purposes. As a rule, this narrowing sooner or later leads to reforms in order to make cadastre a more universal tool. The cadastre of France established by Napoleon Bonaparte, principles of which became a model for such cadastres as the Austrian and German, gradually limited itself to one — fiscal — function. In fact, the French cadastre collected data not only about real estate but also about owners of real estate as taxpayers. The cadastre turned into a data base of taxpayers. It did not meet the requirements for real estate transactions. Therefore, France introduced procedures for clearing titles (as in the USA), in order to collect evidence that the seller of real estate is legal and true owner thereof.

The registration system may also serve many purposes. Having fixed for the first time property rights to a certain object, the system provides for circulation of this right and for burdening it with smaller rights. Property rights may be bur-

⁷⁷ Cadastre—2014. FIG statement on cadastre.

⁷⁸ Guidelines on Real Property Units and Identifiers. — New York and Geneva, UN, 2004. — p.3; Cadastre—2014.

⁷⁹ Land Administration in the UNECE Region. Development Trends and Main Principles. ECE/HBP/140. — Geneva: UN, 2005. — p.31

⁸⁰ Land Code of Ukraine, article 193.

dened (limited) with rights of leasehold, servitudes and mortgage. Reliable fixation of property rights and other rights stemming from it is increasing certainty of parties of market transactions and predictability of their results. In general, it improves the investment climate. It is stated in documents of the Working Party on Land Administration of UN ECE (WPLA UNECE) that “no country can sustain stability within its boundaries, or economic development within the wider world, unless it has a land rights policy that promotes internal confidence among its people, its commercial enterprises, and its government... States that prosper promote widespread and secured private ownership of land as a foundation of social and economic policy.”⁸¹

Contemplating upon multiplicity of functions of the cadastre and registration system, one may conclude that the combination of multi-functional cadastre and multi-functional registry in one unified system also may take place. New systems hold such huge volumes of information and allow for performing so diverse functions that it may be regarded as an extended land information system (LIS). This combination is not something exceptionally new. In the EU a project EULIS (European Land Information System) is implemented, starting in 2006, uniting in real time cadastral and registration systems of Sweden, The Netherlands, Lithuania, England, Wales and Norway. It holds data of about 1.5 million square kilometers of land and 39 million properties. During one year the system registered 2.5 million mortgages and 5.6 million transactions. EULIS has recently been joined by Austria, Finland, Scotland and Ireland. The transformation of traditional cadastrals into comprehensive land information systems is forecasted by many experts as a logical evolution and it shall take place within the nearest decade.

Mentioning only one additional function of the registry — registration of mortgages — allows for considering a multi-functional registration system to become one of the cornerstones of economic development. For example, mortgage-related funds circulating in the economy of Spain amount to 56% of GDP;⁸² in Denmark this figure is reaching 60—70% of GDP. In total, aggregate mortgage assets in 2004 accounted for 40% of the EU GDP.⁸³ Our analysis of data on GDP of several European countries shows clearly the link between GDP of the country and volume of the mortgage market. The next table gives an overview on some relevant indicators in Europe.

⁸¹ UNECE WPLA. Social and Economic Benefits of Good Land Administration. — New York and Geneva, UN, 2006.

⁸² Land Administration in the UNECE Region. Development Trends and Main Principles. ECE/HBP/140. — Geneva: UN, 2005. — p.28.

⁸³ EU Commission Green Paper on Mortgage Market.

Table 6.1*European countries ranked by GDP'04 (output approach) with reference to area and population*

	Country	Area, thnd sq.km	Ratio of area to that of Ukraine	Population, mln.	Ratio of population to that of Ukraine	GDP, USD bln.	Ratio of GDP to GDP of Ukraine	Value of mortgage bond market, EUR bln.
1	Germany	357	0.56	82	1.71	2163.826	8.41	208.694
2	France	551	0.87	62	1.29	1651.518	6.42	44.351
3	UK	241	0.38	60	1.25	1649.315	6.41	0
4	Italy	301	0.48	58	1.21	1497.075	5.82	0
5	Spain	505	0.80	41	0.85	909.982	3.54	25.266
6	Poland	312	0.50	38	0.79	438.480	1.71	n/a
7	Sweden	450	0.71	9	0.19	258.356	1.004	70.906
8	Ukraine	630	1	48	1	257.176	1	n/a ⁸⁴

Source: M. Fedorchenko, O. Yanov et al. Ukraine: Effective Land Resources management at the Local Level. — Kyiv: Center for Land Reform Policy in Ukraine, 2005. — p.246. Data on mortgage bond market — European Mortgage Federation. Mortgage Banks and Mortgage Bond in Europe. 4th edition. 2003.

The best description of a joint functioning of the cadastre and registry is the following ideal case: there are two land parcels located nearby. Cadastre certifies that these parcels are located in a certain place (spatial coordinates are used), have certain shape and area and are adjacent. It also certifies that these parcels are having joint boundary — endlessly thin plane dividing lands of two persons — and are not overlapping or having no-man land in between. Identification of parcels is done with unique indices, and visual depiction — with cadastral plan⁸⁵ and index map.⁸⁶ Registry certifies that land parcels with such indices are certain persons' land. It also fixes rights of third parties and transfer of rights to parcels. In case a dispute emerges, data of the registry is undisputable prove of rights. If the system errs, state as a guarantor of reliability of system will reimburse all losses.

Possible options

Though the essence of cadastre and registry in any given country may be limited to basic functions described above, there are no two countries where these systems are working similarly. Cadastre and registry are a part and parcel of the na-

⁸⁴ It looks like market of mortgage-backed securities in Ukraine has not started yet. Aggregate value of mortgage loans in 2006 in Ukraine amounted to UAH 24 billion (USD 4,75 billion) — data of Ukrainian national mortgage association.

⁸⁵ Cadastral plan depicts only one parcel and shows its shape and objects located upon parcel as well as zone of special legal regimes (public and private limitations and restrictions, servitudes).

⁸⁶ Index map reflects certain territory (cadastral block, cadastral district) and parcels within the district with their cadastral identifiers. It gives the idea how parcels are situated towards each other.

tional social infrastructure⁸⁷ and have been formed under influence of factors that influenced formation of nations. Accordingly, there is a certain diversity of cadastral and registration systems in the world. And when cadastres are differing in volume of data and number of collected attributes, registries are having even deeper divergences.

Diversity of registration systems may be narrowed down to two main types; within each of them sub-types (national variants of the first of the second type) may be singled out.

The first type of the registration system — rights registration system (title system) — provides for fixing data about rights to land parcels. On the basis of defined by the law set of documents (contracts, decisions of competent bodies), facts (acquisitive prescription), events (inheritance), the registrar is fixing rights and holders of rights and issues a certificate which has the status of the only undisputable proof of rights to land. Any other document is not a proof of rights to land. The person stated in the certificate may not be addressed with a vindication claim. The state declares and guarantees that data of the system is reliable and indisputable. To compensate possible losses resulting of errors or crime of the registrar the state sets up a special fund.⁸⁸

This system is common for countries of continental Europe, and therefore it is often called “Central-European” (or title system). This system usually covers the whole country, but in some cases registration of rights is being done when property is transacted (this type of registry is called Torrence system).

The main document of the Central-European system is a Land register (Land book, Grundbuch). This name is explained by the fact that the register — a book — contains a separate page for every “land”, i.e. the registration is parcel-based (just like cadastral registration). At this page data about rights, holders of rights and transfers of rights are indicated. As a rule, the Land registry is parcel-based, but there may be registered rights to a separate apartment in a block-house, buildings erected upon leased parcels etc.⁸⁹ The land book is open to the public (with certain limitations).

The formation of such system requires significant investments at the initial period. The significance of investments is explained first of all by the need to create a nation-wide system for description and identification of real estate and land (cadastre). Such investments may be provided only by the state. Further func-

⁸⁷ Guidelines on Real Property Units and Identifiers. — New York and Geneva, UN, 2004. —p.3; Klaus Deininger. Land Policies for Growth and Poverty Reduction, a Worldbank Research Report, Oxford Press, 2003.

⁸⁸ Guidelines on Real Property Units and Identifiers. — New York and Geneva, UN, 2004. — p.20.

⁸⁹ Nikonov, Zhuravskyy. Real estate, cadastre and world systems for registration of rights to real estate. — SPb.: Roza mira, 2006. Ukraine will employ similar approach.

tioning of the system is covered by user fees. This system is expensive at the beginning, but operation and maintenance thereafter is not expensive for users. Moreover — and that is highly important for a market economy — this system provides for high level of security of transactions. A fool-proof system is particularly important for the development of mortgage financing tools.

The second type of registration system — deed registration system — provides for holding data about different foundations giving rise to rights to property (contracts, documents, events). Information of this system is having rather referential nature; certificates of this system are not confirming rights to property. Rights themselves are confirmed by those documents on the basis of which data were entered into the system. Such system usually guaranties nothing, and its functions are limited to registration of contracts. Therefore in the course of transactions first a clearance of title is performed, i.e. a retrospective investigation in order to make sure that within the last 30 (in France) or 40 (in the USA) years rights to the property were acquired lawfully. Such investigation may give the full-proof guaranty (because registration of contracts has nothing to do with checks upon their legality), and thus transactions are additionally insured against possible vindication claims of third persons. There are specialized law firms and insurance companies providing respective services. Expenses are borne by parties of transaction. For instance, the turnover of specialized insurance companies in the USA in 1980 amounted to USD 1.26 billion.⁹⁰

Such system is created and functioning on account of its users. Its formation is performed gradually, as far as property is transacted, and perspectives of establishing complete data base in respect of real estate are quite remote. The state does not provide any guaranties to transacting parties. In our opinion, this system is typical for countries with highly liberalized economies and Anglo-Saxon legal system (first of all USA). As a rule, the system operates without a unified state cadastre; description of property is done immediately in contracts and stored in data bases of private entities providing insurance and legal services to transacting parties.

It is also pertinent to mention that combinations of cadastre and registry are also providing grounds for further classification. In some countries functions of cadastre and registry is carried out by a single body (Albania, Armenia, Czech Republic, Greece, Netherlands, Italy, Lithuania, Luxembourg, Slovak Republic, England and Wales,⁹¹ Sweden, Scotland⁹²). In other countries cadastre and registry are divided:

⁹⁰ Nikonov, Zhuravskyy. *Op cit.*

⁹¹ In England there is a strange situation: out of 21 million estates registered in the registry only 17 million estates are reflected in cadastre. — M. Fedorchenko, O. Yanov. *Land Law of Ukraine: manual for practitioners in 2 volumes. Vol.1: Land relations in settlements.* — Kyiv, 2006. — p.350.

⁹² Dorine A. J. BURMANJE. *Spatial Data Infrastructures and Land Administration in Europe.* — FIG, 2005 (www.fig.net).

✓ In Spain and Portugal registration of rights is done by private registrars, subordinate to the Ministry of Justice; cadastre is first of all a fiscal instrument and under auspices of the Ministry of Finance;

✓ in France, Scandinavian countries, Poland, Slovenia, Croatia, Estonia and Bulgaria registration of rights is executed by public bodies — courts or notaries public (under Ministry of Justice), and cadastres are administered by different organizations under different ministries or even municipalities;

✓ in Germany, Austria, Latvia, Switzerland registration is entrusted to specialized public bodies (Grundbuch offices having status equal to that of courts), and cadastres are under different organizations under different ministries.

We would add that recently Norway and Iceland have decided to unite registries with cadastres, and to transfer registration from courts (notaries) to cadastral bodies. Among countries in transition similar reform was undertaken by Romania.⁹³ At the same time there are no cases of unification of registries and cadastres under judicial bodies (courts, notaries, ministries of justice).

In general, according to UN ECE information, in 38% countries of Europe registries are under ministries of justice, in 23% — under ministries of natural resources, in 11% — under ministries of finance and in other cases under other ministries.⁹⁴

Thus, all diversity and richness of world practice and experience in the field of cadastre and registration of rights may be grouped into three major options:

1. the American system of registration of rights (deed system) working without unified state cadastre;
2. the Title (Central-European) system combined with cadastre;
3. the Title (Central-European) system parallel with cadastre.

Further classifications are also possible (for instance, on the ground of subordination of cadastre and registry). Here we are not reproducing arguments in favor of any given system, for Ukraine has already made its political choice: the system of registration of rights provided for by the Law of Ukraine “On state registration of real rights to immovable property and limitations thereof” of July 1, 2004, bears all signs of the title (Central-European) system.

We would add that so far there is no full-fledged registry provided by the said law, therefore Ukraine at the moment employs half-American, half-European hybrid with strong Soviet inheritance:

⁹³ Helge Onsrud. Land administration in Europe. FIG, 2004.

⁹⁴ Study on Key Aspects of Land Registration and Cadastral Legislation, 2000 (www.unece.org).

- ✓ Cadastre (State registry of lands) is collecting information on land parcels. It works under the State Committee of Land Resources (Derzhkomzem)⁹⁵ and administered by registration offices of the Center of State Land Cadastre;
- ✓ Registry of contracts is collecting information on contracts with real estate and land. It functions under the Ministry of Justice and administered by notaries;
- ✓ Registry of rights to immovable property is collecting information about rights to buildings and houses. This registry is functioning under the Ministry of Justice and is served by Bureaus of Technical Inventory, BTI — a Soviet relic.

As far as the cadastre (State registry of lands) does not possess legal titles of registry of rights (not mentioned by the Law of Ukraine “On state registration of real rights to immovable property and limitations thereof”), it gives priority legal meaning to the registration of contracts (which is mandatory under the Civil Code). This conclusion is in contradiction with the official position of Derzhkomzem, but current laws of Ukraine do not allow for other conclusions. With entering into force of the said Law the registration of parcels under the Land code (in the State registry of lands) is provisionally keeping its dubious meaning due to the absence of the registry of rights. Another law in force — Law of Ukraine “On local self-governance in Ukraine” — makes its meaning even more dubious for it still reserves the rights to register real estate to executive bodies of local councils.

It is obvious that there is no ideal solution for the unification or separation of cadastre and registry,⁹⁶ though some experts are strongly supporting unification of their functions under cadastral bodies (not under judicial institutions).⁹⁷ Respected international organizations have also made their views known. For instance, the Council of Ministers of the Council of Europe advised to take the registration of property away from courts as a non-judicial function;⁹⁸ the International Federation of Surveyors (FIG) predicted that in the nearest future national cadastral and registration services would merge into unified systems.⁹⁹

International bodies point out that the historical context should be taken into consideration. In those countries where cadastre emerged as a fiscal tool, it was subordinate to the Ministry of Finance, and registry of rights became a responsibility of judicial institutes (Germany, Spain, Portugal). In those countries where

⁹⁵ Nowadays State Agency of land resources of Ukraine.

⁹⁶ Institutional aspects of land market development in Ukraine. Institute for Economic Research and Policy Consulting. German Advisory Group on Economic Reform with the Ukrainian Government. — T17.

⁹⁷ Helge Onsrud. Land administration in Europe. FIG, 2004.

⁹⁸ Recommendation № R (86) 12 dated September 16, 1986.

⁹⁹ Cadastre 2014.

cadastre and registry were introduced within the course of reform of land resources management and spatial planning, they are combined (Sweden, Finland).¹⁰⁰

The main problem of parallel functioning of the two systems is that they are developing on different technical platforms and with varying speed. It complicates the regulation of information flows between the two.¹⁰¹ If the exchange of information is not formalized and is done through submission, consideration and adjudication of requests, information is duplicated and the whole process of property and resources management acquires additional degrees of complexity.

In Ukraine there is not a simple discussion about the problem, a real struggle is going on. Since 1999 Derzhkomzem and Ministry of Justice¹⁰² are claiming the registration of rights for their own offices. We would point out that developed European countries employ both variants, though recently there is a trend to unified cadastre and registry under auspices of cadastre (such reform was undertaken in Italy and Romania, and it is going on in Norway and Iceland). Here we are presenting arguments in favor of both solutions.

Advantages of unification of cadastre and registry are the following:

1. Allows for one-stop shopping (single windows principle) and instantaneous reflection of relevant information in both sub-systems (though countries where they are separated normally have good arrangements to cope with the transfer of data¹⁰³). This is an advantage for users first of all;
2. The profitable system — registration of rights¹⁰⁴ — is subsidizing the unprofitable — cadastre. This is an advantage for the state budget.

Advantages of the separation of cadastre and registry are the following:

1. Cadastre and registry are two principally dissimilar activities based upon knowledge of different sciences, thus effective cadastre and effective registry pledge for specialization in one field only;
2. Parallel and independent systems allow for certain competition and mutual control (democratic checks and balances) in order to exclude errors and abuses which are more available in case of a unified system;

¹⁰⁰ Land Administration in the UNECE Region. Development Trends and Main Principles. ECE/HBP/140. — Geneva: UN, 2005. — p.31.

¹⁰¹ Op.cit.

¹⁰² The State Committee on Construction and Architecture also took part in the struggle.

¹⁰³ Dorine A. J. BURMANJE. Spatial Data Infrastructures and Land Administration in Europe. — FIG, 2005 (www.fig.net). — p.4.

¹⁰⁴ In most European countries revenues of registries are exceeding their expenses — Dorine A. J. BURMANJE. Spatial Data Infrastructures and Land Administration in Europe. — FIG, 2005 (www.fig.net).

3. Conflicts of interest are minimized (formation of real estates in kind and registration of legal rights are divided); this aspect is particularly important in transformation countries with high risk of corruption.

In Ukraine the creation of cadastre and registry was performed with an active participation of the World Bank (Rural Land Titling and Cadastre Development Project). In documents of the Project (of May 2003)¹⁰⁵ it was strongly suggested to establish a title registry with a title registry and cadastre law passed clearly establishing the procedures and responsibilities for registration of titles to all immovable property ***under a single unified, land parcel-based system, managed by one agency***. The Bank pointed out that decisions of the Government supported inefficient multi-agency institutional arrangements that exists at that time. In 2006 the Bank obviously changed its position for one of the managers of the Project said that the Bank would be indifferent towards separation or unification of cadastre and registry. The Bank had seen success of both ways. The main thing was finally to create the cadastre and the registry.

Institutional elements

Necessary institutional elements of functional cadastral and registration systems are the following:

1. State system for description and identification of real estate (cadastre). The system is parcel-based;
2. Administrator of cadastre — state institution;
3. Bodies whose activities provide information for cadastre (surveyors, valuers, experts, notaries);
4. State registry of rights holding information about rights to and encumbrances upon properties listed in cadastre (ownership, leasehold, mortgage);
5. Defined by the law points of access to information of cadastre and registry (Land book, special web-site);
6. Administrator of registry — public body;
7. System of formalized links and for exchange of data between cadastre and registry (if they are separated), among cadastre, registry and local public bodies entrusted with or involved into management of property;
8. Fund for reimbursement of losses caused by errors or crimes of registrar;
9. Fund for reimbursement of losses caused by errors of cadastre.

¹⁰⁵ Project appraisal document for Rural Land Titling and cadastre Development project, Report No 25920—UA, May 30,2003.

A further important issue is the way to fill cadastre and registry with information. In principle, there are only two ways: the first is complete coverage of the country with cadastral maps and complete registration of property; the second is sporadic coverage and registration. Sporadic means that information is filed when the property is transacted. As a rule, complete coverage and complete registration are done within the framework of the state program and on account of the state budget. It gives a complete data base on real estate and land property within state borders. Sporadic registration is done on account of interested parties, may last for ages and never end.

Land reform in Ukraine started with inventory of all lands, but in fact inventory was drawn only in respect of agricultural lands. Within the last 10 years that inventory as well as economic appraisal of land has not been updated. In settlements the inventory has been completed by 50%. Inventory of land and real estate are going on without any coordination, and land parcel and buildings located there upon cannot become a single property unit.

Currently, the pace of inventory is slowing down. The Verkhovna Rada of Ukraine postponed the deadline for formalization of rights to land several times, but complex procedures and increasing costs suspended the process. In 2004 the Parliament limited the price for drawing land titles within the course of gratuitous privatization, but that price is still high for citizens and unprofitable for surveyors. The absence of agricultural land markets, monopsonistic¹⁰⁶ markets for lease of agricultural land, risky character of land transactions have also been hindering formalization of rights and inventory.

Derzhkomzem applied its utmost energies to issuance of land titles to former collective farmers. This work is mostly completed today, but there is no registry of rights capable to serve land markets. It is like a vicious circle: while there is the moratorium on land sales, there is no need for registry, and while there is no registry, there is no need to lift the moratorium. It looks attractive to create the registry within the cadastre and under auspices of Derzhkomzem, because that is the part of the cadastre where land titles are registered (State registry of lands). This may almost automatically become a part of the registry (there are no buildings on agricultural lands, so there is no need to cooperate with intractable BTIs to get the complete information). Unfortunately, almost exclusively paper-based registration of parcels and titles in the State registry of lands renders impossible the formation of a modern unified registry of rights.

Legal issues and needs for improvement

The national legal system shall contain certain set of rules in order to support effective and reliable functioning of the national cadastral and land registration

¹⁰⁶ In a monopsony the market power is in the hand of the buyers.

system. A detailed study of this set was undertaken under auspices of UN ECE.¹⁰⁷ Here we are mentioning the following mandatory provisions:

1. Law recognizes only registered rights and renders unregistered rights non-existent. In Ukraine section 1 of article 182 of the Civil Code and sections 1 and 7 of article 3 of the Law of Ukraine "On state registration of real rights to immovable property..." follow this rule. On the other hand, these laws allow for the conclusion that unregistered exists, because there is no negation of such rights, only declaration of priority of registered rights. Probably, such lenient approach is explained by the fact that in transitional periods many actual holders of property have not formalized their rights yet;
2. Law requires mandatory registration of rights to property. In Ukraine there was a deadline for formalization of actual possession of land, but in September 2005 it was declared unconstitutional;
3. Law defines procedures and rules for initial recognition of the property right (privatization, prescriptive acquisition, construction). Procedures must be precise and detailed enough in order to secure the clearness of the title being entered into the registry and exclude any doubts in respect of lawfulness of further transactions. Unfortunately, in Ukraine these rules are not effective enough, and rights to land and real estate are often recognized on the basis of court decisions that may not be considered lawful. Moreover, norms of the new Land Code allow for different interpretation of executive bodies; they are not applied in a uniform manner throughout Ukraine, contrary to the principles of rule of law;
4. Law forbids claiming property from a purchaser acting in a good faith (bona fide purchaser) whose rights have been registered. In Ukraine this rule is not applicable due to article 388 of the Civil Code providing for the legal possibility to vindicate property from bona fide purchasers. This means that introduction of the registry of rights does not improve the level of protection of investments and security of mortgage;
5. Law on registry shall be free from rules leaving principal issues to the discretion of executive bodies (provision of information, fees, publicity of Land book etc);
6. State registrants shall have high level of legal and social protection. There is no such protection In Ukraine. State registrars have not been granted with a status of state official, they are merely employees of a state enterprise. Illegal influence on registrants does not entail extraordinary measures of legal liability. Thus, declared by the Constitution of Ukraine principles of inviolability and inalienability of private property are not completely realized;
7. Full liability of the state for losses resulting from the functioning of the reg-

¹⁰⁷ Report on Key Aspects of Land Registration and Cadastral Legislation.

istry. Ukraine has not yet defined principles and limits of liability and ways for creation of the special fund;

8. Full liability of the state for losses resulting from the functioning of the cadastre (for instance, in cases of double cadastral registration, issuance of two land titles for one parcel, mistaken or improper cadastral registration etc, i.e. in cases of misrepresentation or distortion of spatial information). In Ukraine, there is no such liability.

Democratic needs for checks and balances

Cadastre has always been and will likely remain a function of the public domain for private entities would not have direct interest to provide the needed services. However, registration of rights is more complex a phenomenon from the institutional and political point of view. The state is usually the biggest landowner,¹⁰⁸ but not the only one, and therefore in the relations of land ownership and in land transactions the state shall participate on equal footing with all other landowners. At the same time the state is a guarantor of protection, inviolability and inalienability of property rights recognized (and registered) by the state. Accordingly, concentration in the hands of the state of all public institutions providing for formalization and circulation of rights renders the state with substantial advantages and superiority towards all other landowners, though one of the principles of modern property systems is equality of all proprietors.

From this perspective, concentration of technical functions (surveying, cadastral registration) and legal functions (registration of rights) in the hands of one institution looks like an extraordinary concentration of power giving rise to additional and unnecessary risks in transactions. At the same time separation of those functions between two, in essence administrative, bodies, is not providing for any security, because in any case the whole set of functions is left in hands of the executive branch of powers. Transfer of registration of rights to courts is also a problem: first of all, courts are there to administer justice, i.e. to solve disputes about rights, and their involvement into the regular process of recognition of rights (registration) casts serious doubts upon their impartiality in adjudicating on rights which have been recognized by the same courts. Secondly, courts (at least, Ukrainian) are strongly dependent upon executive power, and judges are in state of legal vacuum — they are practically uncontrolled and irresponsible. So, unification or separation of cadastre and registry as such does not improve security and reliability of the system and does not support confidence of investors!

In our opinion, if separation of powers with mutual checks and balances is a common principle of all civilized democratic states, including Ukraine, that principle

¹⁰⁸ State of Ukraine owns about 49% of all lands in the country.

shall be implemented in every sphere of public administration, including land management and regulation of real estate (land) market.

Accordingly, legal foundations (legal framework) of cadastre and registry functioning must be defined by legislative power by passing necessary laws. Such laws shall precisely set up procedures for entering, changing and deleting data, legal status of data and information, levels of access of different users to data, fees, protection against unauthorized access, duplication (reserve copying) of data and protection thereof under force-majeure circumstances (natural disasters, political turmoil, wars etc), reimbursement of losses caused by errors and abuses. Laws shall not leave too much space for bureaucratic discretion of executive power. Practical carrying out of cadastre and registry must be performed by an agency (agencies) representing executive power or controlled by it (institutional framework). Actions or inactivity of executive agencies must be challenged in courts competent to adjudicate upon status of data, functioning of cadastre and registry, including disputes of institutions involved into cadastral and registration work.

At the same time introduction of the principle of separation of powers shall not destroy the unity of the cadastral and registration system and the integrity of state land resources management, which are probably major attributes of the modern cadastral and registration systems.¹⁰⁹

In Ukraine these requirements are either ignored or only partly observed. Even in those cases when respective measures are provided by laws, they are not implemented. We are describing the way Ukrainian system works nowadays below, and this description implies insufficient reliability of the system. For instance, information into registries of contracts and mortgages are entered by notaries that are strongly dependent upon the Ministry of Justice issuing licenses and supervising their activities. Functioning of the said registries is regulated by decisions of the Ministry of Justice, which decisions were drafted, passed and registered by the Ministry itself. Such active rule-making of the Ministry (executive branch) under lack of respective laws proves incomplete separation of legislative and executive powers.

Derzhkomzem as a body responsible for carrying out cadastre and registration of rights according to the law (partially responsible in governmental law projects) is in no sense controlled by legislative power. Mind that legislative power has high legitimacy comparing to the government, and therefore an institution responsible for important public functions (cadastre and registration of rights) shall be accountable to the parliament having an exclusive right to define legal regime of the property. A relevant example is the State Property Fund of Ukraine,

¹⁰⁹ Recommendation of UN ECE "Workshop on modern cadastre and land registration systems"/HBP/1999/2 (п.21).

which is not a part to the Cabinet of Ministers and reports directly to the Verkhovna Rada. Regulation of the Fund, list of enterprises to be privatized and list of enterprises exempt from privatization are passed by the Parliament.

A similar position is justified for the case when cadastre and registry of rights are separated. Powers may not be considered separated and mutually controlled, if a law enforcer is not accountable to the lawmaker, and decisions of a lawmaker are not tested against Constitution.

How the Ukrainian system is designed and now operating

A legal basis for the cadastre and land registration system in Ukraine has been established quite recently but not completely. Though land reform was declared in 1990, Law of Ukraine "On state registration of real rights to immovable property..." was passed on July 2004 only. Laws on land cadastre¹¹⁰ and land markets are still missing or under preparation in the year 2007.

The Land Code (in force since January 1, 2002) has not created sufficient legal basis for functioning of cadastre and registry. Registration of rights as such is not regulated by the Code at all, and general rules on cadastre refer to a special law on state land cadastre. It substantiated the position that respective norms of the Code are not directly applicable, and Derzhkomzem does not have competence to issue orders in respect of cadastre and its functioning; issued orders are lacking legitimacy.¹¹¹ This position is quite reasonable because legal regime of property is defined exceptionally by laws of Ukraine, i.e. by legislative power.

Although the volume of normative material existing and in force in Ukraine as of April 2007 is not complete it is obvious to conclude that in Ukraine should be established a unified cadastral and registration system. It should have the following design:

Component	Function/Task	Holder/Administrator/User
State land cadastre (automated)	Cadastral zoning, cadastral surveying, quality of soil, land valuation, state registration of land parcels, monitoring of quantity and quality of lands	Derzhkomzem/State Enterprise (SE) "Center of State Land Cadastre"
State registry of lands (within cadastre)	Registration of land parcels, land titles and lease contracts	Derzhkomzem/SE "Center of State Land Cadastre"/registration offices

¹¹⁰ Law of Ukraine "On state land cadastre" passed by the Verkhovna Rada of Ukraine on March 20, 2007 was vetoed by the President of Ukraine on April 13, 2007.

¹¹¹ P.F.Kulinich. State registration of rights to land real estate and land cadastre: notion, interrelation and legal basis//Juridichnyy Zhurnal, # 11, 2005.

State registry of real rights to real estate (within cadastre)	Registration of rights to real estate (land parcels, buildings, constructions), encumbrances (servitudes, interdictions, arrests, mortgages). Holds information about owners of rights, technical characteristics of real estate, cadastral plans, data about contracts in respect of real estate	Derzhkomzem/SE "Center of State Land Cadastre"/registration offices
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However, the Ukrainian cadastral and registration system has never gained this shape. Requirements of laws and other acts have either been ignored or boycotted by respective institutions, and at the moment these laws and acts are in the stage of review obviously leading to the establishment of a different system (see below). Instead of the unified cadastral and registration system there is a sum of weakly linked components created without proper legal basis. This sum looks like follows:

Component	Function/Task	Holder/Administrator/User
State land cadastre as a unified automated system - DOES NOT EXIST	Cadastral zoning, cadastral surveying, quality of soil, land valuation, state registration of land parcels, monitoring of quantity and quality of lands	Derzhkomzem/SE "Center of State Land Cadastre"
State registry of lands (within cadastre), mostly paper-based	Registration of land parcels, land titles and lease contracts	Derzhkomzem/SE "Center of State Land Cadastre"/registration offices
Registry of property rights to real estate (since 2002, automated)	Registration of property rights to buildings, houses, constructions	Ministry of Justice (ME)/SE "Information Center of ME"/BTI
Registry of contracts (since 2004, automated)	Registration of contracts (in respect of land parcels and other real estates)	ME/SE "Information Center of ME"/notaries
Registry of mortgages (since 2004, automated)	Registration of mortgages	Ministry of Justice (ME)/SE "Information Center of ME"/notaries
Registry of interdictions to alienate real estate (since 1999, automated)	Registration of interdictions to alienate real estate	Ministry of Justice (ME)/SE "Information Center of ME"/notaries

Institutional role and functions of Derzhkomzem

Derzhkomzem all its lifespan (till reorganization in 2007) has been acting on the basis of regulations approved by Decrees of the President of Ukraine.¹¹²

Regulation on Derzhkomzem effective in 1996—2000 defined it as a body responsible for realization of state policy in the field of land relations and carrying out of land reform. Interesting to note that Derzhkomzem in that period was a part of the national agrarian and industrial complex, i.e. it looks like measures of land reform with implementation of which Derzhkomzem was entrusted were first of all related to lands of agricultural use. No function in the field of registration of rights at that time was mentioned.¹¹³

In August 2000 a new regulation on Derzhkomzem was passed, by which Derzhkomzem was defined as a body of executive power responsible for formation and realization of state policy in the field of regulation of land relations, land use, protection of soil, monitoring of land and carrying out of state land cadastre.

On January 1, 2002 the new Land Code become effective, and Derzhkomzem (at the level of a law passed by the Parliament) was entrusted with the task of carrying out state land cadastre, including state registration of land parcels (point “r” of article 15).

In our opinion, those tasks of Derzhkomzem, described above, had very little in common with administration of registry of rights. The only link was that article 193 of the Land Code defined the cadastre as a unified system of cadastral works which sets up the procedure for recognition of the fact of acquisition or cessation of property right or use right to land parcels and holds a sum of data and documents about location and legal regime of land parcels, their valuation, classification of lands, distribution of land among owners and users. Drawbacks of such definition are:

1. It is unclear how the system of WORKS may hold sum of DATA and DOCUMENTS;
2. The result of functioning of cadastre is recognition of the fact of acquisition of cessation of rights to a land parcel, though traditionally this a function of the registry;
3. Cadastre is limited rights of property and use and does not provide for registration or confirmation of other rights or encumbrances;
4. Cadastre is limited to description of land parcels and does not provide for integration of data about other real estate.

¹¹² Decrees of the President of Ukraine of January 6, 1996 № 34/96, of May 13, 1996 № 340/96, of August 14, 2000 № 970/2000.

¹¹³ One of the first draft laws on registration of rights was dated 1999, and Derzhkomzem was only one out of four pretenders for the position of a registration authority.

In 2003 the Regulation on Derzhkomzem was supplemented by the function withdrawn from the Ministry of Justice. Derzhkomzem was entrusted with registration within the cadastre of land parcels, immovable property and rights thereto, land lease contracts, and with carrying out of the State registry of rights to land and immovable property (sub-point 11 of point 4 of the Regulation). In our opinion, the President overstepped the legal boundaries defined by the Code (as an act of higher legal power comparing to the Presidential Decree).

This situation something improved with adoption on July 1, 2004 of the Law of Ukraine "On state registration of real rights to immovable property..." which decided that the registry is a part and parcel of the land cadastre at the highest legal level. Derzhkomzem was appointed a holder of the registry and SE "Center of State Land Cadastre" — administrator thereof.

In practice, this Law has not been implemented. Having examined the current state of land relations in September 2005, the Verkhovna Rada of Ukraine decided upon necessity of completion of establishment of the state land cadastre and introduction of a unified state system for registration of rights in accordance with the Law of Ukraine "On state registration of real rights to immovable property..."¹¹⁴

In fact, Derzhkomzem in the field of cadastre and registration limited itself to the following:

1. It introduced State registry of land to perform state registration of land parcels, land titles and land lease contracts (paper-based).¹¹⁵ State registry of lands is a part of the cadastre, but there is still no cadastre. According to the last Head of Derzhkomzem Mr. Sidorenko, there are 650 cadastrals in Ukraine — by number of units of administrative and territorial division; these cadastrals are functioning on different technologies and do not allow for their integration into one system;¹¹⁶
2. It set up State Enterprise "Center of State Land Cadastre" performing state registration of land parcels, land titles and land lease contracts nation-wide.
3. In our opinion, registration of land parcels in the State registry of lands is having purely cadastral nature and may not substitute real registration of rights to land parcels and limitations thereof. Moreover, registration of parcels is done

¹¹⁴ Points 3.8 and 3.9 of Resolution of Verkhovna Rada of Ukraine # 2897—IV of 22.09.2005.

¹¹⁵ In summer 2006 we visited of the registration offices in Mykolayv oblast. We saw that registration was paper-based and only recently that office started to enter data into computer data base. Unfortunately, that computer was not a part of any network for transfer of data. Communication of data between registration office and regional office of SE "Center of State Land Cadastre" takes place from time to time. Role of human factor is extremely high in this system. Paper land books are not capable to resist registration unlawful, erroneous or distorted data.

¹¹⁶ Announcement "Electronic land cadastre will support property rights of citizens to land" of March 5, 2007 at web-site of Derzhkomzem.

separately from registration of buildings and houses. So, instead of a unified system for registration of rights to real estate there are two independent systems for registration: registry of lands and registry of rights to immovable property (except for land). In fact, this is a preservation of the Soviet system, when BTI performed the registration of immovable property and cadastre performed registration of land parcels in possession and land parcels in use. In practical terms nothing has changed.

On April 4, 2007 the Cabinet of Ministers of Ukraine adopted the Regulation on State Agency of land resources of Ukraine (successor of reorganized Derzhkomzem). The Committee turned into an institution subordinate to the minister of natural resources and environmental protection out of an independent body subordinate to the Cabinet of Ministers. According to the Regulation, the Agency is securing the realization of the state policy in the field of regulation of land relations, land use, protection of soil, monitoring of lands, carrying out of state land cadastre as well as coordination and state regulation in the field of establishment of boundaries of oblasts, rayons, cities, towns and villages.

In the field of cadastre and registration of rights the functions of the Agency are limited to organization and support of carrying out state land cadastre and preparation of cadastral documentation. The Regulation does not provide for the registration of rights in real estate and/or land.

Without respective changes to the Land Code and the Law of Ukraine "On state registration of real rights to immovable property..." the decision of the Cabinet lacks legitimacy. The Cabinet submitted to the Verkhovna Rada of Ukraine draft law № 2597 of November 27, 2006. By this draft law the Cabinet suggests new reading of the Law of Ukraine "On state registration of real rights to immovable property..." and appoint the Ministry of Justice the central body of state executive power in the field of state registration of rights. One of the two opposition factions (Nasha Ukraina) on March 16, 2007 submitted to the consideration of the Parliament a draft resolution on rejection of the said draft law. Nevertheless, the draft law was upheld by the Rada in the first reading on March 21, 2007 (the next day after adoption of the Law of Ukraine "On state land cadastre") and on April 19, 2007 — in the second reading. The law has not yet been signed by the President of Ukraine (though we know that the President vetoed the law on cadastre).

Thus, the notorious problem of duplication of functions of Derzhkomzem by the Ministry of natural resources and environmental protection and Ministry of Justice has finally been solved: a reorganized Derzhkomzem along with functions duplicated by the environmental Ministry was included into that Ministry, and functions duplicated by the Ministry of Justice were transferred solely to the Ministry of Justice.

Institutional role and functions of the Ministry of Justice

After the adoption of the Land Code in 2001, a long-term conflict with respect of which institution should perform registration of rights to land parcels and immovable things emerged between Derzhkomzem and Ministry of Justice. Derzhkomzem insisted on unification of cadastre and registry under its reign. The Ministry of Justice favored separation of cadastre and registry and subordination of the registry to the Ministry. In our opinion, the ground for such dispute between bodies of executive power was a failure of the legislative power to decide upon the issue at the proper level. The Land Code allowed for creation of a separate registration system (State registry of lands) by Derzhkomzem, and Ministry of Justice kept ruling the treasure inherited from the USSR — system of BTI having its legal basis in one norm of the Law of Ukraine “On local self-governance in Ukraine” entrusting executive committees of local councils with the function to monitor and register according to the law real estate objects (article 30). In our opinion, this norm was an insufficient legal basis.

The Ministry of Justice is a main (senior) body within the system of central bodies of executive power with regard to securing realization of the state legal policy.¹¹⁷ Its role in the registration of rights till 2004 was not defined by any *law*,¹¹⁸ as required by the Constitution; at the same time the Regulation on the Ministry of Justice (approved by the President of Ukraine) till February 2003 allowed it to perform registration of rights to real estate and administer respective registry. In February 2003 this function was withdrawn and assigned to Derzhkomzem by the Presidential Decree; later, on July 1, 2004 it was confirmed by the Law of Ukraine “On state registration of real rights to immovable property...” Strictly speaking, from the moment when the said law entered into force, all energy of the Ministry and Derzhkomzem should have been directed towards its implementation, i.e. at the creation of a unified registry. It seems though that both institutions boycotted the law, and kept struggling. If it was so, such mode of action contradicted recommendations of the UN ECE of 1996 requiring national governments to direct their efforts in the field of land policy towards reinforcing confidence of citizens and investors.

During the times of legal uncertainty of cadastre and registry the Ministry of Justice established in its subordination several other registries related to market circulation of immovable assets: Registry of rights to immovable property, registry of contracts, Registry of interdictions to alienate immovable property and Registry of mortgages. With the introduction of the single state registry of rights all those registries had to stop their activities.

¹¹⁷ Regulation on the Ministry of Justice of Ukraine, approved by the Decree of President of Ukraine # 1396/97 of 30.12.1997.

¹¹⁸ This role was defined in a negative way: Law of Ukraine “On state registration of real rights to real property...” entrusted with registration an enterprise subordinate to Derzhkomzem.web-site of Derzhkomzem.

With the adoption by the Parliament of new reading of the Law of Ukraine “On state registration of real rights to immovable property...” (on April 19, 2007) the Ministry of Justice has finally gained the status of the central executive body in the field of registration of rights. The reaction of the President of Ukraine may be predicted: he vetoed recently the passed law on land cadastre for it failed to provide for the creation of a unified cadastral and registration system administered by a single body.

One may note that the executive bodies of Ukraine are in fact making reform of cadastre and registry without necessary changes of respective laws. According to the protocol instruction of the Cabinet of Ministers of March 15, 2006, a special Working group on issues of improvement of legislation on functioning of unified registration system was set up. Upon consideration of the problem, members of the Working group supported the idea of creation of a unified registration system under the auspices of the Ministry of Justice. The World Bank by its letter of May 4, 2006, upheld this position under provision that respective decision of the Cabinet of Ministers would be adopted.¹¹⁹ This information is published at the website of the Verkhovna Rada of Ukraine and signed by the Minister of Justice. Rather interesting that at the same day, when the Working group was set up, on March 15, 2006, at the website of Derzhkomzem it was announced that the Cabinet of Ministers decided to leave the registration within domain of Derzhkomzem which created all necessary technical and organizational preconditions.¹²⁰

On May 26, 2006, the Cabinet headed by Prime Minister. Ekhanurov, decided to transfer assets of SE “Center of State land Cadastre” into the subordination of the Ministry of Justice.¹²¹ Only 2 months later that Cabinet decided to leave to Derzhkomzem assets of SE “Center of State land Cadastre” necessary for discharge of functions related to carrying out cadastre.¹²² Those decisions were taken against the background of still valid rules of the Land Code and Law of Ukraine “On state registration of real rights to immovable property...” subordinating SE “Center of State land Cadastre” to Derzhkomzem. Soon, that Cabinet was dismissed, but its decisions were not reversed.

On January 31, 2007 the Cabinet of Ministers — headed by Prime Minister Yanukovich — decided to reorganize Derzhkomzem into the State Agency of land resources of Ukraine, and on April 4, 2007 a new Regulation on the Agency was approved by the Cabinet. This Regulation entrusts the Agency with administration of land cadastre, but not the registry of rights.

¹¹⁹ Explanatory note to draft law #2597 dated 27.11.2006.

¹²⁰ Announcement “State registry of rights is to be administered by Derzhkomzem” at the official web-site of Derzhkomzem (www.dkzr.gov.ua), placed 15.03.2006.

¹²¹ Order of the Cabinet of Ministers of Ukraine # 295—p of 26.05.2006.

¹²² Order of the Cabinet of Ministers of Ukraine # 419—p of 24.07.2006.

Whatever the reasons of these steps of the Government and the Parliament have been they are not backed by a consistent policy. It is fair to say that the recently passed (and vetoed) law on land cadastre is in contradiction with the new reading of the law on registry: the former regulates the State registry of lands, and the latter abolished that Registry at all (laws were passed one after another). The veto of the President is therefore highly predictable.

Taking into account that legislative and executive powers in Ukraine at the moment are dominated by the coalition (opposed by the President), it is expected that draft laws of the Cabinet will be upheld by the Parliament which in case of Presidential veto will be effectively overcoming it. So, there is significant probability that in Ukraine a separate cadastre and registry of rights will be introduced. This construction is not doomed to success or failure merely on account of separation or unification of cadastre and registry; the most important thing is that two systems work and interact on generally accepted and recognized principles and foundations.

In view of the development of agricultural land markets in Ukraine, one must note that such lands are having distinctive features compared to urban lands. These lands are not used for development and construction. Therefore the separation of technical and legal information about these lands between Derzhkormzem and Ministry of Justice does not matter. The Ministry of Justice does not have any legal information about these lands (except for those parcels that circulated on the market under conditions of moratorium and registered in the Registry of contracts). The cadastre of agricultural lands is in fact a registry of rights to these lands. This feature was mentioned by the World Bank that in this respect advised to design a unified system of cadastre and registry.¹²³ It could be justified to introduce the registry within the cadastre for rural areas (such design is employed in Finland), but it has never happened. In our opinion, the main obstacle was the moratorium on trade of agricultural lands rendering the registry and cadastre unnecessary.

To conclude, we would say that the unified cadastral and land registration system is still provided for by the effective law; while it is in force, all and any actions directed towards different design of the system are lacking legitimacy.

Position of the President, Government and the Parliament with respect to necessary reforms

Currently, the President, the Government and the Parliament adhere to different ideas about the development of the cadastre and registration system. The situation is complicated by the absence of a coherent and public policy in the field; in

¹²³ Project appraisal document for Rural Land Titling and cadastre Development project, Report No 25920—UA, May 30,2003.

any case, the ruling majority in the Parliament of the 5th convocation is revising approaches of the Parliament of the 4th convocation.

Recently, the President of Ukraine signed the Decree “On certain issues of organizational and legal support to formation and regulation of land market and protection of rights of owners of land parcels”.¹²⁴ In that Decree there is no mentioning of registration of rights, but in its draft¹²⁵ it was advised to the Government to consider the merger of Derzhkomzem and State service of geodesy, cartography and cadastre into the Ministry of state land policy with diverse functions in the field of land cadastre, registration of rights and mapping. In the text signed by the President such point was excluded. Nevertheless, till now the Decree “On measures for creation of unified system for state registration of land parcels, immovable property and rights thereto within the state land cadastre” of February 17, 2003 № 134/2003 is valid. It entrusts Derzhkomzem to administer cadastre and registry. These basic provisions of the Presidential Decree were significantly reinforced by the Law of Ukraine “On state registration of real rights to immovable property...” of July 1, 2004.

In our opinion, that Decree and that Law proves that activities of the Ministry of Justice regarding registries (contracts, rights, mortgages, interdictions) are lacking legitimacy.

As stated above, the President of Ukraine vetoed the Law of Ukraine “On state land cadastre” passed by the Parliament on March 20, 2007. One of the reasons for his veto was that the law violated the concept to create in Ukraine a uniform and unified cadastral and land registration system. Therefore, we may conclude that the President is a supporter of merger of cadastre and registry.

The Government of Ukraine during long time was passing decisions that did not facilitate reforming the existing system for protection of rights to real estate. Resolution of the Cabinet of Ministers of May 16, 2002 № 661, of May 15, 2003 № 689, of July 17, 2003 № 1088 preserved status quo and divided cadastre and registry between two bodies; Derzhkomzem was only nominated as responsible for both systems. Resolution of May 16, 2002 № 661 introduced complete duplication of data in two systems (it was in force for 1 year only).

The recent decision of the Cabinet of Ministers supports the opinion that the Government favors the idea of separation of cadastre and registry. So far the Parliament was upholding draft laws submitted by the Cabinet (see above). In fact, the Parliament rejected the concept developed by the Rada of previous convocation (establishment of unified system).¹²⁶

¹²⁴ Decree of the President of Ukraine # 644/2006 of 25.07.2006.

¹²⁵ <http://www.myland.org.ua/ukr/12/171/191/363/4546/>.

¹²⁶ Resolution of the Verkhovna Rada of Ukraine # 2897—IV of 22.09.2005.

We have also to stress that despite clear division of the Verkhovna Rada (ruling coalition of Party of Regions, Socialist Party and Communist Party and united opposition of BYUT and Nasha Ukraina), there were inter-faction submissions. People's deputies I. Kyrylenko and E. Sigal (BYUT), V. Slauta (PR) and V. Silchenko (SPU) registered a joint draft resolution of the Verkhovna Rada of Ukraine on establishment of a unified body in the field of land cadastre, mapping and registration of rights.¹²⁷ We would like to add that the position of the majority in the Rada seems to be in favor of separation of these three functions among three executive agencies.

Views of independent experts

There is a discussion among Ukrainian experts with regard to the redistribution of functions of Derzhkomzem. Mostly, they are discussing transfer of registration to the Ministry of Justice and control functions as regards protection of soils and grounds to the Ministry of Natural Resources and Environmental Protection. We are not aware of any discussions whether Ukraine shall accept deed registration system; there seems to be a consensus on the idea of title registration system that is widely accepted among experts.

Well-known Ukrainian experts are mostly insisting on separation of the land cadastre and registration of rights. For example, Pavlo Kulinich, Senior scientific assistant of the Institute of state and law of the National Academy of Sciences, stressed that till the registration system provided for by the Law of Ukraine "On state registration of real rights to immovable property..." and Agreement with the World Bank is created, the old system provided for by the Law of Ukraine "On local self-governance in Ukraine" is the only legitimate.¹²⁸ That means that registration of rights must be performed by executive bodies of local councils, i.e. municipalities. From this position all activities of Derzhkomzem and Ministry of Justice in the field of registration look quite dubious. Mr. Kulinich considers the registration of rights within the cadastre as "gravely erroneous", though he acknowledges the merit efficacy ("one-stop shopping" advantage).¹²⁹ Erroneous nature of such design of the registration and cadastral system he substantiates by the fact that unfortunate terminology of the Land Code allowed for creation of two registration systems: State registry of lands and State registry of rights to immovable property (and the Code is indeed applying terms like "registration of parcels", "registration of land titles" and "registration of rights to parcels"). Activities of Derzhkomzem in the field of registration of land parcel in the State registry of lands has uncertain

¹²⁷ Draft resolution of the Verkhovna Rada of Ukraine.

¹²⁸ R. Illichiv, S.Kovalenko. Arithmetic of reform//Business — #14 of 05.04.2004.

¹²⁹ P.F.Kulinich. State registration of rights to land real estate and land cadastre: notion, interrelation and legal basis//Juridichnyy Zhurnal, # 11, 2005.

legal meaning, outcomes of such registration are unknown, and fees for the registration are collected without proper legal basis.

Anton Tretyak, PhD, professor, correspondent member of Ukrainian Academy of Agrarian Sciences, Head of the Union of Surveyors of Ukraine, expressed a negative attitude towards concentration of functions and authority in hands of Derzkomzem.¹³⁰ Though Mr. Tretyak was not directly opposing the idea of inclusion of the registry into the cadastre, he considered work of Derzkomzem ineffective against the background of the Ministry of Justice which implemented and improved numerous registries in a fast pace. Later he definitely supported the withdrawal of registration from Derzkomzem and transfer of the registry to the Ministry of Justice.¹³¹ A similar position was expressed by Mr. Kalyuzhnyy, Head of the Association "Land Union of Ukraine."¹³²

Foreign experts whose opinion was asked earlier by the Institute for Economic Research and Policy Consulting, advised to set up in Ukraine a unified cadastral and registration system.¹³³ This view is mostly common for European experts¹³⁴ and supported by international expert organizations.¹³⁵ In our opinion, governments shall take into account views of the International Federation of Surveyors (FIG) predicting transformation of cadastre and registry into a unified land information automated system capable of solving diverse tasks and providing information to numerous users in different fields of activities when designing national cadastral and registration systems. This concept is described in the well-known document Cadastre—2014.

At the same time such international organizations like UN ECE take due account of the fact that every national cadastral and registration system bears signs of the national sovereignty, and therefore they restrain from giving priority to any given design of the system. UN ECE diplomatically noted that in the future it is important either to integrate cadastre and registry or to secure effective formalized procedures and vehicles for exchange of information and data between them.¹³⁶

¹³⁰ V.Chopenko. Land reform has stuck in ... land//Zerkalo nedeli of April 29, 2006.

¹³¹ V.Chopenko. Land, poste restante//Zerkalo nedeli of 12.03.2005.

¹³² Whether in Ukraine there be created market system of the state land cadastre? — joint declaration of A. Tretyak and M. Kalyuzhnyy of 05.06.2006 (www.zsu.org.ua).

¹³³ Institutional aspects of land market development in Ukraine. Institute for Economic Research and Policy Consulting. German Advisory Group on Economic Reform with the Ukrainian Government. — T17.

¹³⁴ Helge Onsrud. Land administration in Europe. FIG, 2004; FIG statement on cadastre (1995) ISBN 0—644—4533—1.

¹³⁵ Cadastre—2014.

¹³⁶ Land Administration in the UNECE Region. Development Trends and Main Principles. ECE/HBP/140. — Geneva: UN, 2005. — p.31.

Experts convened by the UN in Bogor in 1996 expressed their support to the definition of cadastre suggested by FIG: "A Cadastre is normally a parcel-based, and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, the ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (e.g. valuation and equitable taxation), legal purposes (conveyance), to assist in the management of land and land use (e.g. for planning and other administrative purposes), and enables sustainable development and environmental protection."¹³⁷ This definition, in our opinion, is based on the idea of unification of cadastre and registry.

Policy options

Our position is that state registry of rights to agricultural land parcels and other real estate shall be a part and parcel of the state land cadastre, and this complex shall create a single land information system. Provided legal, organizational and technical requirements described above are observed, such multi-functional land-information system would become an effective tool for spatial planning, management of territories, support of land market functioning, mortgage finance development, taxation and valuation.

Separation of cadastre and registry emerged in those times when technologies would not allow for combination of graphic and textual information: properties were depicted on maps, and in land books rights were written down. Nowadays modern technologies allow for creation of data bases uniting different kinds of information as well as more advanced space models with ability to collect, store, process, analyses and transfer many attributes of real objects.

At the same time one must admit that unification or separation as such is not crucial for the success of cadastral and registration system: "success of a cadastral system is not dependent on its legal or technical sophistication, but whether it protects land rights adequately and permits those rights to be traded (where appropriate) efficiently, simply, quickly, securely and at low cost. However if the resources are not available to keep the cadastral system up-to-date then there is little justification for its establishment."¹³⁸

Unfortunately, during years of land reform in Ukraine almost nothing has been done for the establishment and functioning of such a land information system. The territory of Ukraine is missing adequate cartographical coverage, there is no unified automated system of cadastre, and there is no information to enter

¹³⁷ <http://www.fig.net/pub/figpub/pub13a/figpub13a.htm>.

¹³⁸ Bogor Declaration of UN Interregional meeting of experts on cadastre, 1996.

into that system. Registration of parcels (not rights to them) is still paper-based. For the protection of rights of land owners this registration does not have decisive meaning and is rather performed for cadastral monitoring of distribution of land among users and owners. Information of the State registry of lands is not open to public. In our opinion, publicity and transparency of information about land parcels and rights to land parcels is one of guarantees of legitimacy and legality of transactions with land.

According to information of the Accounting Chamber of the Verkhovna Rada of Ukraine, the system of Derzhkomzem was spending budget funds either ineffectively or with misappropriation.¹³⁹ Financing of the Component E “Development of the system of cadastre” (Rural Land Titling And Cadastre Development Project) was suspended by the World Bank because there was no progress in realization of that component. As regards the implementation of the Law of Ukraine “On state registration of real rights to immovable property...”, the opinion of the Bank was similar: minimal progress.¹⁴⁰

At the same time the Ministry of Justice of Ukraine was consistently, though without *sufficient legislative support*,¹⁴¹ establishing separate elements of the state registry of rights: Registry of interdictions to alienate immovable property (1999); Hereditary registry (2000); Registry of rights to immovable property (2002); State registry of contracts (2004); State registry of mortgages (2004). These registries are organized in a unified data base which is served and administrated by specialized state enterprise “Information Center of the Ministry of Justice”. One must also take account the Civil Code of Ukraine requires notarization of contracts with real estate and land, therefore persons performing notarization (notaries) are in a better position to transfer data to the state registry of rights.

These two moments — absence of progress in actions of Derzhkomzem (as regards establishment of the automated cadastral system and registry of rights) and productivity of the Ministry of Justice (at least, as regards technical side of registration) — leads to the idea of the creation of a separate registry of rights under the Ministry of Justice.

At the same time it is impossible to assert that this decision is indisputably optimal. The mere fact that Derzhkomzem failed to create a registry of rights is not an irrefutable proof of success of the Ministry of Justice. Under success we mean

¹³⁹ Official press-release of the Accounting Chamber of 06.06.2006 (http://www.ac-rada.gov.ua/achamber/control/uk/publish/article/main?art_id=660114&cat_id=505).

¹⁴⁰ Letter of the World Bank of 4.05.2006.

¹⁴¹ Under insufficient legal support we mean that fact that the Constitution of Ukraine requires legal regime of property be defined by laws passed by the Parliament. Any registry of the Ministry of Justice does not meet this requirement for it was not set up on the basis of a law.

not the creation of the registry as such, but an increased level of security of transactions with land and real estate.

We would like to point out that the separation of land cadastre and registry of rights is in contradiction with the concept of real estate introduced by the Civil Code of Ukraine (land and inseverable improvements). A similar position is adopted by the Land Code of Ukraine which provides for transfer of rights to land in case of transfer of rights to property. It looks like cadastre may be limited to technical information about land parcels, and other immovable property will not have any system for description of property. New reading of the Law of Ukraine "On state registration of real rights to immovable property..." mentions technical inventory of property (registration of rights is performed upon technical inventory), but it does not define the legal meaning and status of its results, and does not say where technical information goes and is stored. Accordingly, description, monitoring and taxation of real estate will either be complicate or barely possible.

The separation of tasks, done without necessary precautions, may turn transactions with immovable property into lengthy, expensive and exhaustive processes. The praised principle of "one stop shopping" is not applicable. Parties of a transaction with real estate and land would be exposed to a multi-stage procedure, additional expenses and risks.

At the same time unification of cadastre and registry in Ukraine encounters unexpected obstacles and hindrances. The human factor in this situation is of utmost importance. During decades land surveying in Ukraine was developing as purely technical activity based upon geodesy, topography and cartography. Within the course of land reform this situation has not been changed. For example, License Provisions for Land Surveying¹⁴² contain requirements in respect of inclusion into personnel of a surveying company of specialist graduated with specialization "Land surveying and cadastre", "Cadastre". No requirements with regard to legal knowledge. Academic programs of surveying departments of Ukrainian universities offer students about ten different kinds of geodesy, but very few hours of land law and land management. We would add that modern technologies and equipment (first of all GPS) do not make necessary for a land surveyor to possess vast and diverse knowledge in the field of geodesy and mapping, and significantly simplify cadastral surveying and mapping.¹⁴³

Judicial profession in Ukraine is also very specialized and purely humanitarian, i.e. lawyers (advocates, notaries, judges) do not have technical knowledge on land laws and land management.

¹⁴² Order of the State Committee of Ukraine on Entrepreneurship and Derzhkomzem # 28/18 dated 13.02.2001.

¹⁴³ Cadastre—2014, p.41.

So, current state of these two professions, most important for cadastre and registration of rights, is such as to necessitate the separation of the technical and legal side of the work. Acknowledgement of this fact may be found in the Law of Ukraine "On state registration of real rights to immovable property..." article 8 says that the state registrar of rights must have a university degree in law. So, License Provisions requires from surveyors deep knowledge of geodesy and topography, and the Law requires from registrars extensive legal knowledge. In Ukraine everything related to legal profession is under the domain of the Ministry of Justice responsible for implementation of the state legal policy.¹⁴⁴

The level of professional training of employees of the system of Derzhkomzem as well as of notaries is still capable of improvement. As a result, their actions and decisions are often erratic. We have seen reports of the state land surveying expertise which were in clear contradiction of the current legislation. On the basis of such report land lease contracts were concluded and registered in the State registry of lands and State registry of contracts. We have also seen notarized contracts for sale of agricultural lands concluded and registered under the moratorium and land titles were issued on the basis of such contracts.

Officials performing cadastral and registration works are left unprotected against side influences,¹⁴⁵ and courts are often facilitating actions now commonly referred to as "raiding".

So, licensing, professional attestation, qualification exams, state expertise do not guaranty quality of cadastral and registration works and security of property rights. One of the possible solutions is introduction of a fully automated system which will oppose incorrect actions of illiterate or mischievous users with technical and software means.

Another problem is the absence of existing or described in a law mechanism for exchange of information and data among agencies, enterprises and bodies involved into cadastral works and registration. Without such exchange it is hardly possible to set up an efficient registry. Moreover, there might appear a problem guarantying reliability of information of the registry; so far registration of rights to real estate is done by municipal enterprises (BTI), but the state must be guarantor and the one to reimburse the losses.

According to our view, the most important reason for slow and inefficient reform in the field of cadastre and registration of rights is of political or rather economic and political nature. There are two land reforms in Ukraine running simultane-

¹⁴⁴ Regulation on the Ministry of Justice of Ukraine, approved by the Decree of President of Ukraine # 1396/97 of 30.12.1997.

¹⁴⁵ Under protection from influence one shall understand restriction of possibilities for making influence, liability for influence or attempts to perform influence as well as amenability towards side influences.

ously. There is the official one declared by the Resolution of the Verkhovna Rada of Ukraine. The result of this reform is initial privatization of land, change of the structure of land ownership in the country and creation of prerequisites for land market functioning. The second — shadow — reform is aiming at redistribution of land (first of all, agricultural) under the conditions of the moratorium. Land is sold with the use of different black and grey schemes, without sufficient control and — as a result — at low prices, and when the moratorium will be lifted and the land market legalized, its first players would be several hundreds of speculating landowners Ukraine-wide. They are not interested in functioning of open transparent land markets with multi-functional cadastre and reliable registration system — till the moment when grey redistribution of land is complete. Transparent and secure land markets will immediately attract serious foreign investors with whom Ukrainian capital cannot compete.¹⁴⁶ Thus, before completing that shadow reform there are strong and influential lobby groups to prevent the development of cadastre and registry and the lifting of the moratorium. Taking into account that in Ukraine the power and the capital are closely connected, public administration are incapable (and not really interested) to adopt and implement decisions directed towards the creation of a functioning cadastral and registration system. That inability and indifference have already been noted by various NGOs.¹⁴⁷

Taking into account this situation, we think that impartial expert advice on either option may be undesirable and inexpedient: Ukraine's attempts to switch to unified cadastral and registration system have proved to be unsuccessful, and there are no ground to believe that attempts to develop separated cadastre and registry will have better results. There are examples of effective land markets under conditions of integrated cadastre and registry as well as under conditions of their separate functioning. That means that effectiveness of the market is not critically dependent upon integration or separation of cadastre and registry. The main task and challenge is the establishment of a cadastral and registration system (or systems) providing easy access to land resources, secure rights to land and to support effective circulation of rights at reasonable cost.¹⁴⁸ Therefore we are leaving the choice to those responsible for and entrusted with political choices and restricting our advice to the following:

Laws on cadastre and registry shall not leave too much space for discretion and rule-making of executive power;

¹⁴⁶ According to the Association of Ukrainian banks, aggregate capital of Ukrainian banks — members of the Association, as of March 1, 2007 reached USD 8,83 billion. Capital of one Russian bank — Saving Bank — as of April 1, 2007 amounted to USD 24 billion.

¹⁴⁷ Draft law 1037—1: all land to peasants. And to nobody else (<http://www.myland.org.ua/ukr/12/169/110/4790/>).

¹⁴⁸ Bogor Declaration of UN Interregional meeting of experts on cadastre, 1996.

Laws on cadastre shall be directed towards creation of a unified nation-wide data base. At the same time there are no reasons to oppose creation of municipal cadastres, provided they are employing identical with the state cadastre technologies and standards, working in the same reference system, and support complete integration of state and municipal data bases;

Laws on cadastre and registry shall not have contradicting and mutually exclusive rules. Even under conditions of separate cadastre and registry they are part and parcel of one and same system, the unity of which is crucial for effective state management of land resources;¹⁴⁹

The Land Code of Ukraine must be improved in respect of procedures for acquisition of rights in order to exclude diverse interpretation of its rules by local executive and self-governance bodies and to introduce nation-wide uniform procedure for acquiring rights in land;

Registration of rights to property must be mandatory, and fees for registration must be cost-covering;

Filling of cadastre and registry with data must be staged; first of all, there shall be information necessary for transactions. At later stages all other additional information may be added. Every attribute of the property to be included into cadastre requires significant expenses that may not be justified for a country in transition. Therefore, analysis of cost and benefits shall be performed first, and the cadastre and registry shall be affordable for the country at any given moment;

Registry of rights must be single and state-owned throughout the country. State shall guaranty reliability and trustworthiness of its data. Losses caused by errors or abuses of registrars or third persons must be reimbursed by the state in full on account of the special fund formed on account of fees;

State registrars shall have high level of legal and social protection guarantied by the state, and bear severe criminal liability for wrongful, malicious or negligent attitude to their duties;

Professional training of land surveyors shall include full-fledged courses of land law and management of land resources;

The State must facilitate establishment of professional self-regulated bodies of surveyors (just like auditors and appraisers have). Such associations must introduce unified standards of surveyors' services;

Registered rights shall be considered lawful. Any person whose rights are not registered shall have no recourse to vindication of property from bona fide pur-

¹⁴⁹ Recommendations of UN ECE "Workshop on modern cadastre and land registration systems"/HBP/1999/2.

chaser whose right is registered. Bad faith of a purchaser shall be proven only in the courts;

Information of the registry must be stored in a data base with high level of technical and physical protection. The copy of the registry must be also securely stored;

Administration of cadastre and registry must be as automated as possible: it will reduce influence of human factor, speed up processing of data, create possibilities for analysis and transfer of data as well as for interaction of different state information systems;

Access to information of the registry shall be open to the public with limitations and restrictions related to protection of privacy provided for by the national legislation and international treaties;

Access and level of access of bodies of public administration to cadastre and registry shall be defined by their status and also automated. Rules like "local councils have the right of access to data of cadastre/registry if their request for information is within their competence" suggest that employees of the registry and cadastre will be adjudicating upon competence of bodies of public administration. Adjudication upon competences is in domain of judicial power, i.e. such rules are contradicting principles of separation of powers. In our opinion, rules like this are at the heart of anarchy and unlawfulness in access to the registry and cadastre;

Laws on cadastre and registry shall precisely define links and ways for exchange of data among all institutions involved into cadastral and registration functions. If there is an effective mechanism for data exchange between cadastre and registry in place, the separation of cadastre and registry will not have effect upon functioning of the land market and of systems themselves (cost, complexity of operation and maintenance);

Information on land resources and rights to property which has no restrictions related to protection of privacy and state secrets shall be open to the public in a way excluding administrative discretion and abuses in giving access to information (for instance, via special Internet site);

The cadastre shall cover the whole territory of the state with no exception, and its information shall be up-to-date at any given moment (in fact, establishing an automated cadastral system is less complex than keeping it up-to-date);

The registry shall contain information about rights of private persons, municipalities and the state;

Land surveying works throughout Ukraine must be carried out in a single refer-

ence system. Nowadays there are cases when land parcels allocated in kind in local reference system, from the point of view of the national reference system are abroad or lying across the border;

Land surveying works throughout Ukraine must be carried out with mass application of GPS technologies and GPS equipment. GPS is considered a cheap, precise and fast method for drafting cadastral maps and performing cadastral surveying. GPS in principle minimizes needs for permanent geodetic reference networks and allows for saving significant public and private funds.

7. Barriers to Investment in the Agriculture and Food Sector in Ukraine

This paper was requested by the German Committee on Eastern European Economic Relations within the Federation of German Industries and prepared in 2006. It summarizes general and specific barriers to investment with a focus on the agriculture and food sector inputs. The paper outlines the state of affairs of import regulations for selected inputs, identifies the bottlenecks and non-tariff barriers to trade, and is proposing ways for improvement. The analysis has been conducted in two steps. First, the official import regulations for selected products and inputs have been assessed. In the second step interviews with selected agribusiness operators have been conducted to include their views and perception of barriers to investment in the analysis. The paper ends with specific recommendations for investment promotion and with necessary Government actions to improve the legal and institutional framework conditions for a positive investment climate.

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Introduction

Efficiency and competitiveness are the key issues for any country that intends to become a real player on world markets. Investments from domestic and foreign investors in improved technologies and technical progress will increase efficiency and competitiveness of Ukrainian agriculture. There have been dozens of investment climate papers written over the last decade, including papers produced by the German Advisory Group (GAG) and the Institute for Economic Research and Policy Consulting (IER)¹⁵⁰ and there is little to add to that quite comprehensive analysis. Despite voluminous literature produces on this topic still investments in the sector have been too low during the last years.¹⁵¹ Currently, investments are much lower than necessary for developing the agriculture and food sector. Foreign Direct Investment (FDI) plays a particularly important role. It adds to domestic capital accumulation (about 15 % of total investments), facilitates access to international markets and brings additional knowledge to the country. Ukraine lags behind most emerging economies. During the first years of economic recovery in Ukraine, consumer demand was the main domestic contributor to growth. Another key engine could be external demand on world food markets. These markets offer interesting opportunities with additional demand for bio energy raw materials and bio fuels.

Table 7.1
Growth of investments in Ukraine

2002	2003	2004	2005 (estimate)	2006 (forecast)
3.4 %	22.5 %	10.2 %	-3.1 %	4.3 %

Source: IER, inflation adjusted.

Table 7.2
Growth of the agriculture sector in Ukraine

2002	2003	2004	2005 (estimate)	2006 (forecast)
2.0 %	-11.0 %	19.5 %	3.6 %	3.1 %

Source: IER, inflation adjusted.

In our analysis we provide a sector level approach to the problem and mostly concentrate on import regulations (tariff, non-tariff), which in some cases constitute significant investment barriers for input supply. Ukrainian agriculture needs investors to bring in new machinery, equipment, seeds and the know-how embodied in agricultural technology. Increased opportunities to invest in better inputs will help farmers and agribusinesses accelerating growth and income levels for capital accumulation and follow-up investments. Increased efficiency and

¹⁵⁰ GAG (1997), Mollers, F. et al. (2001), Thiel, E. (2002), IER and GAG (2004), IER and GAG (2006).

¹⁵¹ Cf. Monthly Economic Forecasts, Institute for Economic Research and Policy Consulting, Kyiv.

competitiveness in turn will help to expand Ukrainian agriculture and food exports. In this view any obstacle that complicates the inflow of agricultural technology into Ukraine represents an investment barrier. Therefore, import regulations have to be very carefully analyzed whether they constitute in fact barriers to investment.

Although some work has been done in this direction,¹⁵² however, not all aspects are available in one publication. In our approach we applied the following steps. First, we describe general import regulations, where we basically summarize information available from different sources (see USDA FAS and Moody/Polivodskiy 2005). Additionally, we annex a detailed list of tariff regulations/barriers currently in force. Second, we offer a detailed analysis of non-tariff import barriers to agricultural inputs.

The Ukrainian Government welcomes and supports investments in the agriculture and food sector. However, support policies need transparency and harmonization with international trade standards in view of WTO accession and approximation of the legislation to EU standards. Currently, growth of investments is limited by unpredictable policy environment in general, and sometimes inconsistent and intransparent Government policies, excessive administrative regulations and high import tariffs for some key inputs. Therefore, the paper ends with future relevant WTO regulations for the agriculture and food sector.

Approach and methods

This paper summarizes general and specific barriers to investment with a focus on the agriculture and food sector inputs. It takes specific German supply and investment interests into consideration to support the policy dialogue between Germany and Ukraine. The paper outlines the state of affairs of import regulations for selected inputs. It further identifies the bottlenecks and non-tariff barriers to trade and the ways for improvement. WTO requirements (Agreement on Agriculture, Agreement on Sanitary and Phytosanitary Measures SPS, Agreement on Technical Barriers to Trade TBT, Agreement on Trade-Related Aspects of Intellectual Property Rights TRIPS), institutionalizing the world trade, and the needs for adaptation of these trade standards for the stimulation of investments, are explained.

The analysis has been conducted in two steps. First, the official import regulations have been documented and assessed. They are presented and discussed in the first part of the paper and the annex. It has to be noted that import regulations are not necessarily investment barriers. Import regulations are justified to reach certain Government legal, trade or food safety objectives. These are legit-

¹⁵² USDA FAS (2004) and (2005); EBRD (2006).

imate import regulations. However, regulations may become excessive trade barriers in some cases. To facilitate the identification of those specific cases we conducted a comprehensive analysis of relevant import regulations documented in the annex of the study.

In the second step interviews with selected agribusiness operators have been conducted to include their views and perception of barriers to investment in the analysis.¹⁵³ Additional expertise was available due to previous research and consultancy work.¹⁵⁴

The following input sectors have been considered in our analysis:

- a) agricultural machinery
- b) agro-chemicals
- c) seeds
- d) livestock inputs
- e) livestock equipment

These sectors have been chosen because we consider these inputs are key investments in Ukrainian agriculture where Foreign Direct Investment plays a significant role. Therefore, trade barriers for these inputs may be considered as investment barriers.

The paper ends with specific recommendations for investment promotion related to the above listed branches and with necessary Government actions to improve the legal and institutional framework conditions for a positive investment climate.

General import procedures for agricultural inputs and products

Import regulations in Ukraine are applied in the following way. Customs authorities upon clearance at the border collect all applicable duties and taxes, unless the cargo is forwarded to a bonded warehouse. Import duties might be in ad valorem terms (% based on the value of the goods), specific (absolute figures) or combined. For the combined duty the higher rate of the two is applied. The following steps must be taken when importing inputs or agri-food products into Ukraine:

- Register contract at commodity exchange;
- Pay import duty — defined in Custom Tariffs of Ukraine
- Pay Value Added Tax — 20%

¹⁵³ See annexed list of organizations, companies and contact persons.

¹⁵⁴ See Moody and Polivodskyy (2006); Nivyevskiy and Strubenhoff (2006).

- Pay other taxes (e.g. excise)
- Pay other customs duties

The import of agricultural produce including agricultural inputs is regulated in the law of Ukraine “On state regulation of import of agricultural produce” of July 17, 1997 (amended). Article 4 of this law states that agricultural produce, which is imported to the territory of Ukraine, is a subject to obligatory certification, sanitary-epidemiological, radiological and for certain types of produce — veterinary and phytosanitary control. Exporters from abroad have to confirm the exact import procedures for individual products prior to shipment with their importers. It is necessary to make sure that all required inspection services are performed at a given entry point.

The unified duty was introduced after approval of the Law of Ukraine “On the unified duty charged at the points of passing the state border of Ukraine” from 4 November 1999 N 1212—XIV. The unified duty is set for vehicles owned by domestic and foreign owners, which are crossing the state border of Ukraine and is paid at the entry points on the State border of Ukraine in accordance with Ukrainian legislation for conducting customs procedures during transit of commodities and vehicles, sanitary, veterinary, phytosanitary, radiological and environmental control of commodities and vehicles, for passage of vehicles along Ukrainian roads and for passage of vehicles with exceeding size, total mass, axle load and (or) external dimensions. The unified duty includes fares for along Ukrainian roads (per each kilometer) and fares for conducting control and is paid one-time depending on shipment type (import, transit) based on one single payment document depending on type, capacity or total mass of vehicles.

Any food product, food raw materials and agricultural products including agricultural inputs are prohibited entry into Ukraine without documented evidence of their quality and safety. The following documentation is required for customs clearance:

a. Certificate of conformity. This document confirms that agricultural products are properly identified and comply with the requirements of the obligatory quality and safety norms and standards in force in Ukraine. It is issued by the State Committee of Ukraine on Standardization, Metrology and Certification or an authority that is authorized (accredited) by the State Committee. There are more than 100 institutions authorized to conduct certification in the Ukrainian Certification System UkrSEPRO. Foreign certificates are taken into account only in cases when mutual recognition of such certificates is included in provisions of respective international agreements. So, imported produce must be confirmed by a certificate of conformity or a certificate of recognition of foreign certificate. There are two options to receive the certificate of conformity:

- The certificate is given for a period of two to three years in case all consignments shipped to one single recipient during the whole term of validity of the certificate. In this case commodities are produced serially
- The certificate is given for each specific consignment

b. State sanitary and epidemiological expertise certificate. The State Sanitary and Epidemiological Service of the Ministry of Health Care of Ukraine issues to the importer the certificate of state sanitary and hygiene testing conforming or not of the produce to the medical requirements of safety for human life and health.

c. Veterinary certificate. Every consignment imported into Ukraine is inspected and sampled regardless of the statements made in the accompanying veterinary health certificate. The importer/exporter will have to bear the costs associated with testing in the border laboratory or in the Central State Veterinary Laboratory in case of appeal. The testing costs vary between USD80 and USD500 depending on the number of tests required and the number of uniform lots in the shipment. The testing procedure takes up to 7 days making import of some highly perishable goods impossible.

d. Quarantine import permit/phytosanitary certificate. The phytosanitary certificate confirms that quarantine materials correspond to the requirements of safety standards. Ukrainian Phytosanitary inspectors conduct initial inspection of the cargo at the port of entry and take product samples for the laboratory test to verify that live quarantine pests are not present in the cargo. If the exporting country has no state bodies on quarantine and plant protection, import is allowed after a quarantine import permit is granted. The quarantine import permit is issued by Golovderzhkaranteen (Main State Inspection on Quarantine of Plants of Ukraine) and confirms that the product corresponds to the requirements of safety standards.

Major investment barriers perceived by the industry

Despite various barriers to investments described below the interviewed agribusiness operators perceive the unpredictable policy environment as the single most important obstacle. Businesses usually adapt to corrupt schemes by adding bribes to their costs and rolling it over to the client. They can even handle tedious and complicated registration and border clearing requirements. They can overcome everything as long as the environment remains stable. Businesses claim, "Let it be bad but stable!"

The very recent example of ad-hoc policy changes was the introduction of grain export licensing and export quotas in October 2006. After introduction of grain export licensing, many traders in Ukraine stopped buying grain although ships

have been ordered months ago leading to losses of several million \$ for individual grain traders. This deteriorates the investment climate and will certainly negatively impacting investment decisions.

What does this mean? It shows the commitment of the Government to secure cheap flour for the state-owned bread producing company and to secure cheap feed grain for livestock producers. It further shows the interests of a few are of higher value than the welfare of the whole country. The introduction of grain quotas can be interpreted as a general mis-conception of the functioning of export-orientated market operations in an open economy. A few market operators benefit but the whole economy is losing welfare. The farmer at the end of the value chain will pay the price for this policy measure for he receives lower grain prices. This contradicts the political intentions. It adds to higher market transaction and infrastructure costs, one of the major bottlenecks to develop the sector.

Reducing market infrastructure costs would require further investments in improved marketing, handling and shipping facilities and equipment as well as more competition, e.g. to reduce the market power of individual providers of transport services. Private traders including foreign investors are by far the most important source of investment and know-how and, if permitted, they will develop a highly competitive, dynamic and efficient grain and oil seed marketing system for Ukraine.

Almost all agribusiness operators complained about the lack of qualified personnel in agriculture and agribusiness in Ukraine, beginning at the farm level (milkmaid and agronomist) and ending with agricultural economists with relevant skills to manage farms and agribusinesses and to develop the sector. There are only limited expectations in improvements during the next 3 to 5 years. Agribusinesses usually invest about 6 months in training before staff is able to perform at the required level.

Our first conclusion is that ***the Government should put major emphasis on developing concepts and instruments for improving the investment climate and to enhance education in the sector.*** Old and discredited models and habits have to be replaced by new ones. Investment in human capital for research, education, extension, management and policy analysis should become top priority in Ukrainian agricultural policy. No other measure can produce comparable returns on investment in the long run. The existing agricultural research and education establishment in Ukraine needs competition, new ideas and fresh blood.

A further important bottleneck mentioned by many agribusiness operators is the absence of a functioning agricultural land market. This is perceived as a precondition for increasing the efficiency and competitiveness of agriculture and an additional source of finance and investment for the sector. Land should have a

real value and contribute to rural livelihoods, as well as the development of rural financial markets. In this view ***the expected lifting of the moratorium on land sales in January 2008 will greatly contribute to investments in the sector.***

Another bottleneck reported by some agribusiness operators is ***imperfect legal framework and weak law enforcement.*** There is a lack of corporate governance rules that would ensure the transparency in shareholders' relationships, protection of companies from hostile takeovers (corporate raiders), minority shareholders' (property) rights protection etc. The current Law On Joint-Stock Companies and Regulation CMU on Joint-Stock Companies # 8326 does not solve disputable issues between shareholders as for the mandatory redemption of shares, quorum in JSC, pre-emptive rights etc. Weak judiciary system, with lack of independency and poor enforcement of court decisions constitute a major stumbling block for the development of an efficient legislation framework.

Agro-chemicals

According to the agro-chemical sector working group including the German companies Bayer Crop Science and BASF at the European Business Association EBA in Kyiv the industry sees major weaknesses in a) customs clearance procedures, b) registration procedures and c) trade with agro-chemical counterfeit and fake products.¹⁵⁵

Customs clearance procedures: Customs authorities may delay customs clearance due to chemical analyses of active ingredients although such an analysis is a pre-condition for state registration at the Ministry of Environmental Protection and has already been done for registration purposes. The Customs authorities do not sufficiently take into consideration the documents available at the Ministry of Environment. This is possible due to inconsistencies in the Customs Code.

Registration procedures: Agro-chemical products may be registered for a validity period of ten years or for two years for experimental purposes. Many generic products are temporarily registered for two years only. As the documents required for long-term and short-term registration are different this puts the manufacturers of the original product — previously heavily investing in research and development of the original product — in an unequal position for it may delay the registration of the original product. Generic products come into the country with limited control and accelerated registration. This practice may lead to lower qualities of the available products on the market.

Recently, the Government has been requesting the industry to re-submit various documents to confirm the patents. The justification for this bureaucratic procedure is weak and the purpose unclear.

¹⁵⁵ See EBA: Barriers to Investment in Ukraine, Kyiv, May 2006.

Counterfeit and fake products: The industry estimates that about 10 to 20 % of the market volume of about 180 mln USD in 2006 has been illegally produced, illegally repacked or is fake. The distribution of counterfeit products undermines the rights of producers, users and consumers. Due to recent awareness campaigns of the EBA and the EU in Ukraine in close collaboration with Ukrainian authorities the industry estimates that the market share of counterfeits has been slightly reduced. Also, legislation has been improved by the Ukrainian Parliament recently. However, the problem remains serious. State inspection and law enforcement are still too weak. This adversely affects the image of Ukrainian law enforcement bodies in view of WTO membership.¹⁵⁶

Agricultural machinery

The agricultural machinery industry reports about phytosanitary certification of their imported new products to be added to the customs declaration. This measure can hardly be justified and should be regarded as an extreme example of legislation facilitating arbitrary actions of the involved Ukrainian authorities. This leads to higher costs of doing business and higher risks of corruption.

Ukrainian export-import operations require for various reasons, e.g. legal transfer of ownership rights, 100% up-front payment for the imported machinery, seriously limiting opportunities of domestic enterprises. At the same time, it is possible to take a credit for the imported machinery with a foreign bank. However, this option is rarely used since it requires relevant communication skills and international experiences of Ukrainian banks' servants. Also, this option does not allow Ukrainian enterprises to receive interest rates compensation. A Government scheme to refund interest rates is available but the buyer receives the money only after having bought and received the machinery. This puts additional uncertainty on the purchase and reduces liquidity of the investor.

International experience shows that leasing of agricultural machinery is a good option to reduce investment costs for the farmer ("UkrAgroLeasing" supplies according to CMU Regulation¹⁵⁷ machinery and equipment to farms at an annual interest rate of less than 10%). However, this option does not function well in Ukraine and does not play a practical role in financing agricultural machinery. In practice, official depreciation rates do not correspond with the leasing cycle and the up-front payment of import duties plus VAT additional to the first leasing rate makes this financing scheme less attractive. Also, agricultural enterprises pay VAT two times. First, when the machinery is imported at the border and secondly when agricultural enterprises pay the leasing rates in the following years.

¹⁵⁶ See Moody and Polivodskyy (2006).

¹⁵⁷ Regulation of CMU # 1904 as of 10 December 2003.

The certification process is a specific barrier that costs time and nerves of the importers. Additionally to the first registration of the product each supply has to be identified again. This procedure is hardly justifiable and leads to arbitrary actions of the concerned administration.

Some operators in the industry report about the difficulties to enforce contracts by the prosecutor's office in case of insolvent or unwilling clients. The reputation and image of the prosecutor's office in this respect is generally bad.

Seeds

According to the agricultural working group at the Eastern Council of the German Industries in Berlin including representatives of the German seed industry, the industry perceives the import tariffs on sugar beet seeds as prohibitively high. This was also the reaction of the Ukrainian sugar industry and sugar beet producers in a previous analysis of the sugar sector.¹⁵⁸

The import tariff on sugar beet seeds has been fixed in April 2003 at 22 Euro per kg seed independent of the processing stage. Previously, the tariff has been fixed at 70 % of the value. This de-facto increase of the tariff lead to prices of imported seeds that are three times higher than seeds of domestic origin. The Ukrainian sugar beet producers are thus excluded from technical progress on world seed markets as well as the Ukrainian seed producers themselves. This weakens the competitiveness of the whole sugar value chain. Limited competition will have a disastrous long-term effect on the viability of the Ukrainian sugar beet seed industry itself.

Input traders report about grey imports of seeds (mainly sugar beets, but also rape seed and malt barley) from Poland to Ukraine that may account for up to 50 % in the sugar beet sector.

A further issue concerns genetically manipulated seeds. Officially, Ukraine is free of GMO seeds but in practice this may be threatened by the lack of consistent legislation to punish the producer. Technical thresholds are not defined.

Livestock

As a consequence of BSE cases in Germany a few years ago, the import of breed cattle from Germany has been banned by Ukrainian authorities. Due to adequate measures of the German authorities (strict animal identification and traceability schemes) according to EU legislation trade with breed cattle has been re-established with many countries including all new member states of the EU in Eastern Europe. Also, negotiations with important trade partners in Northern Africa and

¹⁵⁸ See IER policy paper on restructuring of the sugar sector.

Russia have been successfully closed based on the principle of a fixed lowest date of birth for imported breed cattle (July 1, 2001).

The Ukrainian dairy industry is one of the most important food sectors in Ukraine and many agribusinesses are planning to expand production and trade of dairy products through investments in dairy processing. Their major concern is the availability and quality of raw material supply. Although the number of cows in Ukraine is quite significant, most of them are producing milk in low-performing village herds with a peak of production in summer. However, the demand for dairy products has its peak in winter. Therefore, the dairy industry will be forced to invest in high performance milk production units to ensure sufficient quantity and quality of raw milk for processing. High potential breeding animals are an important element to increase productivity in the value chain of the dairy sector. The sector needs less low performing village cows but more high performing quality breed. Breeding cows from the EU including Germany can play an important role to increase productivity of the dairy sector in Ukraine.

Livestock equipment

The current market volume for modern dairy equipment on farm level is estimated by the supply industry at 20 mln. US\$ annually. This is an extremely low level compared to Central and Western Europe. With about 3.5 mln. cows in the country, the current investment volume is about 6 US\$ per cow and year. This is about 1 to 5% of the investment level in Western Europe. At the processing level some investments have taken place in dairy facilities but also at a very limited level. Compared to Russia where many international players invested in green-field dairy plants around the big cities after the 1998 Rouble devaluation investments in Ukraine are comparatively low. Assuming that the dairy sector represents interesting opportunities with comparative advantages the sector needs a lot of public attention to restructure the dairy value chain.

Perceived investment barriers by the industry are:

- import tariffs of 5 to 20 % for dairy equipment
- certification, food standards
- low quality of the raw milk
- slow VAT refunding
- non-functioning rural land and financial markets

A further specific customs clearance problem might occur since the Ukrainian buyer of the foreign equipment has only 90 days after prepayment to clear the whole operation. However, due to technical problems the delivery of agricultural

or food equipment might take much longer (for example to build a food processing and packaging line in a dairy plant). To prolong the period an additional permission of the National Bank of Ukraine is needed. This procedure can hardly be justified.

Meat exports

To diversify food exports the EU market offers interesting perspectives. Ukrainian producers are able to produce beef at comparatively low costs and agribusinesses from Western Europe consider investments in feedlots and modern meat processing plants in Ukraine. First pilot investments show good technical and financial results.¹⁵⁹ However, the food safety and food traceability standards of meat exports to the EU have to be respected. At this moment, Ukraine is unfortunately not eligible to export meat because it lacks the so-called "Third Country Status". To obtain this status the Ministry of Agricultural Policy has to follow a standard procedure of the EU. This includes (i) funds for a residue monitoring plan (available in 2004 and 2005, not available in 2006, to be provided in 2007), (ii) answering standard EU questionnaires on veterinary standards and procedures.

On company level the producer has to be certified according to EU food import rules. As pilot operators are large and experienced food businesses they would be able to facilitate market entry not only for themselves but also for following other domestic beef exporters. The potential pilot exporters should receive more attention by the Government.

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¹⁵⁹ OSI International invested in a feedlot and meat processing plant in Hazatin, Vinnitsa Region. OSI Group needs about 170.000 t o beef annually a.o. for deliveries to the Mac Donalds Group in Europe. Ukraine is considered as a potential supply country for the group.

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Appendix

Table A 7.1

List of relevant contacted Organizations, Companies and Contact Persons

	Contact person	Company/Organization	Position
1.	Brückner, Holger Zurupja Vadim	Westfalia Surge Ukraine	Director General Director
2.	Bulgakova Alla	Lemken-Ukraine	Chief executive
3.	Fedorenko Sergey	Ukrros	President
4.	Feofilov Sergey	Ukragroconsult	Director General
5.	Rehbein, Joerg	Bayer Ukraine	Director General
6.	Schimetschek Hartmut	OSI International Foods GmbH	Director Business Dvt. Eastern Europe
7.	Kube Harald	BASF Ukraine	Country manager
8.	Buchma Maryna	European Business Association	Executive Director
9.	Tschagarovskij Wadym	Ukrainian Union of Dairy Enterprises	Chairman of board of directors
10.	Yakovenko Anton	Rise - Agroservice	Financial director
11.	Sauer Gerlinde	Eastern Council of German Association of Industries	Managing Director of Agricultural Working Group
12.	Lissitsa Alexej	Ukrainian Agrarian Confederation	General Director
13.	Lapa Volodymyr	Ukrainian Agrarian Confederation	Analytical department head
14.	Varodi Oksana	IFC PEP in Ukraine	Projects Development Officer
15.	Afanasiev Igor	Agency for Investment and Development	Director
16.	Starikov Olexander	Apple Consulting	Head of Investment Projects Department
17.	Kaliberda Alexander	World Bank	Senior Projects Officer
18.	Schroeper Dorian	Alfred C. Toepfer International	Export Administrator
19.	Artiushyn Olexander	Ukrainian Grain Association	Deputy General Director
20.	Usov Anton	EBRD	Communication adviser
21.	Kresse Stefan	German Embassy	Counselor for Agriculture, Food, Consumer Protection and Environment

Specific import regimes for agricultural products

Crop seeds and other plant origin inputs to agriculture

Import tariffs

Table A 7.2

Customs duties

Seeds/other plant origin inputs	Import duty
Soft, hard wheat; corn hybrids; pea; soybean; peanut packed; flax; rapeseed; sun-flower seed; anise; coriander; cumin; caraway; alfalfa; clover; vetch; lupine; kohlrabi	0%
Sorghum hybrids	2%
Rice; peanut other than packed; poppy; vine grafts	5%
Mushroom spawn, haricot; mustard;	10%
Perennial plants	15%
Potato; palm nuts; cotton; castor; sesame; safflower; hemp; oil cakes; Other than pea beans; by products from processing and feed for animals	20%
Rye; barley; oats;	€20/t
Buckwheat; millet;	€50/t
Molasses	€80/t
Onion; garlic;	€200/t
Sugar (cane/beet)	50 %, but not less €300/t
Other sugar, including lactose, maltose, glucose, fructose, honey	€300/t
Sugar beet seeds	€22000/t

Source: Custom Tariffs of Ukraine

Non-tariff import procedures:

Seeds may be imported if the following requirements are met:

a. Registration. Prior to importing seeds for commercial release each plant variety has to be registered in Ukraine. It is done to protect the intellectual property of plant breeders and to assure farmers that the variety has all the features claimed by its developers. The State Service for Plant Varieties Rights Protection (Ministry of Agricultural Policy) is responsible for the registration process. After the plant variety is listed in the State Register of Plant Varieties, or in the process of registration or imported for the first time for trials, research or display purposes, variety owners of the above listed species may obtain a Ukrainian patent that will ensure their exclusive rights in the country or simply lists the variety in the Register. The second option provides a higher degree of intellectual property rights protection and is usually preferred by companies without their own

distribution system. The entire plant registration process may take up to three years and costs about USD 750 if the variety is registered in another member country, and reach USD 10 000 otherwise. There are annual payments for maintaining a patent or maintaining a variety in the Register. The patent fee gradually increases from USD 90 for the second year to USD 600 for the tenth and every consecutive year. The fee for keeping a variety in the Register is USD 20 during the first five years per annum, after it gradually increases to USD 300 in the 16th year of registration.

b. Import permit. This document is granted by the Main State Phytosanitary Inspection Service of Ukraine of the MAP containing information on species allowed for entry, quantity, list of pests, product-specific treatment requirements, entry points into Ukraine and post-entry inspection procedures.

c. Certificate of conformity. See text for details

d. Phytosanitary certificate from the Plant Health Organization of the exporting country.

e. Quality certificate. The State Seed Inspection Service of the MAP tests imported and domestic seeds for complying with Ukrainian quality standards. The same standards are applied both for imported as well as for domestic seeds. Certification usually takes up to 30 days. On average each sample test costs USD 22.

Additionally to the above requirements, the State Sanitary and Epidemiological Service of Ukraine requires testing of seeds for pesticides. Also, each seed lot must be tested for compliance with radio-ecological standards.

Genetically modified plants. Currently, there is no legislation in place that clearly defines how products of biotechnology can be developed, traded or utilized within Ukraine. Furthermore, there is no official line of authority by agency for the regulation of biotechnology. There is a draft law (pending review by the Ukrainian parliament since November 2002) that divides responsibility for the development, testing, and registration of domestic and imported products of biotechnology among various government agencies. Adoption of this law will enable the regulatory process to commercialize plant biotechnology products in Ukraine. According to Government authorities, Ukraine is free of genetically modified organisms (GMO). However, business operators expressed doubts about this assumption because of the lack of adequate legislation and law enforcement bodies.

Animals and animal origin inputs

Tariffs

Table A 7.3
Customs duties

Animals and animal origin inputs	Import duty
Cattle sperm; Cattle embryos; Pedigree animals (cattle, horses, sheep, goats, chicken)	0%
Liquid Milk	€0.1/liter
Milk powder, condensed milk, lubricator	€0.5/kg
Buttermilk	€0.2/kg
Butter	€1.5/kg
Cheese	€0.8/kg
Eggs	€1/kg
Beef; mutton; pork; goat meat	10 %, but not less €600/t
Poultry (uncarved)	10 %, but not less €400/t
Poultry (carved, parts) and its subproducts (liver, hart etc)	30 %, but not less €1500/t
Food animal byproducts (liver, tongue, heart, guts, for pharmacy industry etc); Lard	€500/t
Other meat	10%

Source: Custom Tariffs of Ukraine

Non-tariff import procedures

To import livestock produce into Ukraine an importer should have permits and certificates of the following authorities:

- a. Hygienic conclusion of the State sanitary-hygienic examination.
- b. Certificate of conformity.
- c. Veterinary certificate.

The costs of the non-tariff import procedures cannot be identified precisely since the costs depend on the type of certification we mentioned in section 3, i.e. whether the certificate is based on the consignment or the production site. In case the production site is inspected the travel of a specialist to the importing country is necessary. The client should cover such costs. In some cases the total value of certification and documentation may exceed USD10 000.

Agricultural machinery

Tariffs

Table A 7.4
Customs duties

Machinery	Import duty
Equipment for lifting, transferring, loading and unloading developed for agricultural tractors; seeding and planting machines; scattering fertilizers machines; mowing machines; hay collecting machines; straw and hay presses; grain combine harvesters; potato diggers and collectors; beet diggers; silage combines; grapes combines; machines for cleaning, sorting and screening eggs, fruits etc.	0%
Diesel engines for wheel agricultural tractors	5%
Plough; harrow; cultivators; scarifiers; weeding machines; caterpillar tractors; wheel agricultural tractors	10%
Garden tractors	15%
Wheel tractors for semitrailer transferring:	
- New	5%
- Used	10%
Automobiles and trucks	25%
Dump-body trucks	20%

Source: Custom Tariff of Ukraine

Non-tariff procedures

Agricultural machinery requires some non-tariff import measures. To avoid repetition but keeping the structure consistent we refer the reader to section 4 for more detailed information on this issue.

Agricultural and food processing equipment

Tariffs

Table A 7. 5
Custom duties

Equipment	Import duty
For spreading liquid and powdery substances for agriculture and horticulture; for lifting, transferring, loading or unloading (on tractors) in agriculture; for feed preparing to animals; for aviculture; for cleaning, sorting and calibrating grain and beans, except those used on farms; for milking; for milk treating and processing. Drying apparatus for agricultural products. Scales for animals	0%
Confectionary equipment	1%
Brewery equipment	2%
Bakery and macaroni production equipment	3%
Refrigerators; machines for washing, drying, filling of bottles, bags, labeling; presses for production of vine, juices etc; beverages production equipment; fruit, nuts, and vegetable processing equipment	5%
Hand tools: spade, picks, saps, pitch-fork, rakes, axes etc; milk skimming machines	10%
Sugar production and meat processing equipment	12%

Source: Custom Tariffs of Ukraine

Non-tariff procedures

Agricultural equipment requires some non-tariff import measures. To avoid repetition but keeping the structure consistent we refer the reader to section 4 for more detailed information on this issue.

Agro-chemicals

Tariffs

Table A 7.6
Custom duties

	Import duty
Fertilizers:	
Nitrogen based	5%
Phosphorus based	5%
Potassium based	
Natural potassium salts (carnallite, sylvinite, etc)	0%
Mixed element or other fertilizers	5%
Agro-chemicals	Up to 20 %

Source: Custom Tariffs of Ukraine

Non-tariff procedures

Agrochemicals and pesticides have several non-tariff measures that hamper imports to the country and investments in the sector. To avoid repetition but keeping the structure consistent we refer to section 4 for more detailed information on this issue.8. The Role of Farm Advisory Services.

8. The Role of Farm Advisory Services

Based on the request of the Ministry of Agrarian Policy of Ukraine in 2007, this chapter gives information on the amount of state budget expenditures allocated for agricultural advisory services in a few European countries: Denmark, Poland and Germany. As there is no single German model, models of agricultural advisory are presented in the case of four German states. Also, the paper describes in brief the institutional setting that is in place in the respective countries to show how and where the funds are flowing. This analysis allows drawing conclusions as regards the financing of agricultural advisory in Europe and developing some recommendations for Ukraine on this basis.

Justyna Jaroszevska,
Institute for Economic Research and Policy Consulting, German-Ukrainian Policy
Dialogue in Agriculture, Kyiv

Introduction

On January 1, 2005, the Law of Ukraine “On Agricultural Advisory Activities”¹⁶⁰ entered into force, providing for a legal basis for the delivery and financing of agricultural advisory services in Ukraine. According to article 5 of this law, advisory activities in Ukraine may be performed at the expense of state and local budgets, and customers, as well as at the expense of grants, international technical aid, funds of international programs and projects, charity contributions of natural and legal persons, and of other sources that are not prohibited by law.

Further, the law “On Agricultural Advisory Activities” distinguishes between socially-oriented services and other services. Socially-oriented services are those services which are financed by state and local budgets. They shall be specified in a state purpose program of agricultural advisory activity to be prepared by central authorities. Apart from that, local governments can name additional socially-oriented services to be financed by local budgets. Socially-oriented services shall be contracted to advisory services providers in a tendering procedure. Advisory services which are not envisaged by the state purpose program shall be rendered at the expense of their customers (article 6 of the above law).

On July 11, 2007, the Cabinet of Ministers adopted the relevant resolution “On adoption of the state purpose program of agricultural advisory activity until 2009”.¹⁶¹ According to the authors, the aim of the program is the creation of an effective and accessible network of agricultural advisory services in Ukraine to meet the needs of agricultural producers and rural population. The approximated value of state budget expenditures for the implementation of the program accounts for UAH 31 510 000 in the years 2007—2009.

Table 8.1

Calculated value of budget expenditures for the state purpose program of agricultural advisory activity according to the newly adopted resolution

Source	2007	2008	2009	2007-2009
State budget (UAH)	10 000 000	10 500 000	11 020 000	31 510 000*
Local budgets (UAH)	1 660 000	1 730 000	1 830 000	5 220 000
In total (UAH)	11 660 000	12 230 000	12 850 000	36 730 000**

*After adding the amounts from previous columns, it makes UAH 31 520 000.

**UAH 36 740 000 then.

Source: Resolution of the Cabinet of Ministers No 927 of 11 July 2007

¹⁶⁰ Law of Ukraine No 1807 of 17 June 2004.

¹⁶¹ Resolution No 927 of 11 July 2007.

The Ministry of Finance, while drafting the state budget, shall take into account budget expenditures for the financing of the state special purpose program of agricultural advisory activity. The issue of the funds allocation is then subject to a separate resolution of the Cabinet of Ministers. For the year 2007, 9,3 million of UAH is earmarked in the state budget for the financing of extension and advisory services. The relevant resolution on their allocation in 2007 was adopted by the Cabinet of Ministers on September 19, 2007.

By establishing above-mentioned legal framework, Ukraine chose the way it wants the agricultural advisory system to work — with non-public service provision and public financing of socially-oriented services. The costs of other services shall be covered by their customers. In this situation, the question for Ukraine is not any more about choosing between either public or private agricultural advisory system but rather about the amount of state subsidies to support the chosen model.

Based on the request of the Head of the Department of agricultural education, science and extension at the Ministry of Agricultural Policy of Ukraine, Dr Tetyana D. Ishtchenko, this paper gives information on the amount of state budget expenditures allocated for agricultural advisory services in a few European countries: Denmark, Poland and Germany. As there is no single German model, models of agricultural advisory will be presented in the case of four German states. Also, we describe in brief the institutional setting that is in place in the respective countries to show how and where the funds are flowing. This analysis allows us to draw conclusions as regards the financing of agricultural advisory in Europe and to develop some recommendations for Ukraine on this basis.

Denmark

Denmark has a unique privatized agricultural advisory system, where farmers are both the owners and users of the system. The Danish Agricultural Advisory Service is a partnership made up of two levels: the Danish Agricultural Advisory Center located in Aarhus and local advisory centers across Denmark.

The Danish Agricultural Advisory Center (National Center) serves as "advisor to the advisors", playing the role of a development center, as its primary task is to provide technical know-how and services to the local advisory centers. It provides direct advice to farmers only in a few special fields where it would not be profitable to engage specialists at the local level, e.g. horse breeding.

There are 46 local advisory centers in Denmark, advising farmers on a direct basis on technical, economic, educational, IT and social issues. They are owned and managed by the local organizations under Danish Agriculture — the national farmers' organization. Each center sets up a committee which prioritizes its pro-

essional tasks. The members of these committees are farmers who have been elected by farmers' organizations and who in that way are involved in the everyday work and management of the advisory center. Moreover, farmers and heads of departments from the local advisory centers participate in drawing up a strategy for the National Center. It is also farmers who prioritize the tasks to be performed for the grants received by the National Center.

According to the 2007 annual report of the Danish Agriculture Advisory Service, the Danish advisory system employs a total of 3 500 staff, of whom 481 are employed at the National Center in Aarhus. To meet their educational needs, a special training academy was founded in 2006.

The independence of the Danish advisory system from the state can be noticed best when looking at its financing model — since 2004 agricultural advisory services are not financed from the state budget. Instead, the expenses are covered by farmers. It should be noted that this market economy approach led to the situation where the local centers compete not only with private consulting companies but also with each other. Each of them has an own budget and their assignment to a certain region is not as tight as earlier.

As of 1 January 2004, the government grants for the agricultural advisory services ceased. We list the other sources of income of the Danish Agricultural Advisory Center in Aarhus.

Table 8.2

Receipts of the Danish Agricultural Advisory Center¹⁶²

Source of income	2004	2005	2006
Year			
User fees and sales (Euro)	29 731 183	30 322 148	36 671 141
Tax reimbursement fund (Euro)	11 895 161	12 389 262	12 563 758
Project funds (Euro)	8 857 527	10 697 987	12 885 906
Danish Agriculture (Euro)	1 841 398	1 838 926	1 932 886
Extraordinary income (Euro)	0	1 140 940 ¹⁶³	0
In total (Euro)	52 325 269	56 389 263	64 053 691

Source: Annual Reports for 2005, 2006 and 2007 of the Danish Agricultural Advisory Service, National Center.

As can be seen above, the turnover of the Danish Agricultural Advisory Center has increased over the last three years and amounted to EUR 64 053 691 in 2006.

¹⁶² The amounts in DKK were exchanged into Euro at the official exchange courses of December 2004, December 2005 and December 2006 (source: National Bank of Denmark).

¹⁶³ It is a capital transfer from the Danish Association of Horticultural Producers because the National Center took over the advisory function and magazine works from the association.

Most of the income comes from user fees and sales. It stems from the local advisory centers in connection with their purchase of services such as IT programs and advice. A considerable part of income derives from project funds for tasks the National Center was awarded a contract for or tasks where it sought funds for a certain activity — in both cases on the domestic market as well as in the EU. The next source of income are tax reimbursements, which are derived from pesticide taxes and earmarked for research, trial, development, education and information projects. To be funded by tax reimbursements, the projects must either be of benefit to an entire branch of production or to all farmers. Finally, a small part of the National Center's income comes from grants from Danish Agriculture — the national farmers' organization. To put it another way, in 2006 the user fees and sales represented 57% of the total income of the National Center, tax reimbursement — 20%, project funds — 20% as well and the grants from Danish Agriculture 3%. Such income distribution has not changed much over the last three years.

As already mentioned above, 46 local advisory centers have their own budgets. The main source of their income is fees paid by farmers for the received services. Additionally, the local centers sell services to the National Center in Aarhus. The value of such services amounts to approximately EUR 5 100 000 per year.¹⁶⁴ This amount covers payment for advisory services in connection with participation in development projects, reporting data to be used in databases, participation in trial work, etc.

Poland

Poland has a state agricultural advisory system. In 2004, it underwent a reform to make the system adjusted to the new conditions resulting from the Polish EU accession. Since then, the tasks of advisors include assistance to farmers in applying for EU structural funds and direct payments. The new law "On agricultural advisory bodies", initiating the reform, was adopted by the Parliament on October 22, 2004, and entered into force on January 1, 2005. According to this law, the agricultural advisory system in Poland is composed of the Agricultural Advisory Center (National Center) located in Brwinów and its branch offices in Poznań and Kraków and regional agricultural advisory centers on district level.

The Agricultural Advisory Center reports to the Ministry of Agriculture and Rural Development. Its role is to coordinate agricultural advisory services in Poland. The Center develops and distributes to the regional centers information and training materials, organizes training for advisory centers' staff, establishes and

¹⁶⁴ According to the Annual Reports for 2005, 2006 and 2007 of the Danish Agricultural Advisory Service, National Center.

administers the information systems and databases and organizes conferences and seminars in the field of agriculture and rural development. Additionally, it is responsible for certification of agricultural advisors and maintaining of a relevant register. Generally, it does not provide direct advice to farmers.

Agricultural services to farmers are provided to the customer by the regional advisory centers operating in every voivodship. They do have their local teams of advisors also at the local levels of a powiat and gmina. Farmers can influence the way the center carries out its activities through the participation in special committees that advise the center's director.

In Poland, approximately 5 350 persons are employed in the state agricultural advisory units, of which 4 400 are advisors and specialists. The Agricultural Advisory Center has approximately 250 employees.

According to the law "On agricultural advisory bodies", there are two main sources of income of the state advisory centers in Poland: state budget/budget of the voivodship and EU funds. The Agricultural Advisory Center in Brwinów is financed directly by the national state budget whereas the regional centers receive funds from the voivodships' budgets, that is local budgets.

Additionally, the law "On agricultural advisory bodies" provides that the state advisory centers are legal persons and can charge fees for their services. However, the list of such services is strictly regulated by law. It includes inter alia support in accounting and in the promotion of agri-tourism. Other services are provided to farmers free of charges.

It is important to note that the year 2004 was the last one before the reform. In this year, the state funds were directed not only to the national advisory center in Brwinów and at this time its nine branch offices (EUR 8 818 599) but also to the regional advisory centers (EUR 37 110 628), which are financed by the voivodships' budgets now. It gives an explanation to the fact why the state funds decreased so sharply in 2005.

Table 8.3

National state budget expenditures on the agricultural advisory system¹⁶⁵

Year	2004	2005	2006
Expenditures (Euro)	45 929 227	2 633 817	2 664 569

Source: Agricultural Advisory Center in Brwinów

The Polish Accession Treaty with the EU foresaw the possibility of co-financing of agricultural advisory services in the framework of the European Agricultural

¹⁶⁵ The amounts in PLN were exchanged into Euro at the official exchange courses of December 2004, December 2005 and December 2006 (source: National Bank of Poland).

Guidance and Guarantee Fund (EAGGF) under the Sectoral Operational Program for Agriculture. Thus, since the accession both the national and regional centres apply successfully for EU funds. The value of all projects, carried out so far by the National Center, is more than EUR 2 000 000.¹⁶⁶ Training for farmers can be supported by EU funds too.

In Poland, agricultural advisory services are provided also by the Chambers of Agriculture, which act in accordance with the law "On agricultural chambers" of 14 December 1995. These are farmer-controlled organizations, located in each of 16 voivodship, financed by the members' contributions and fees. Additionally, the cost of the official duties the Chambers performs for the government is refunded from the state budget.

Germany

Each of the sixteen German states is responsible by federal law for agricultural advisory services. For this reason, agricultural advisory systems have a different organizational set-up in each state. All states can be broadly grouped into three main organizational forms of agricultural advisory. There are Chambers of Agriculture in the north and northwest of Germany while in the south agricultural advisory is the responsibility of the state ministry of agriculture. In Eastern Germany various private-oriented advisory systems predominate. After unification the new federal states had to cope with re-privatization of large agricultural holdings. It created a great demand for advice on legal and structural issues, which could have been covered in a short-term by private companies only. It would have taken time to install the chambers of agriculture, and the states feared investing too much in an uncertain environment as it was unclear as to the types of farms that remain viable after the reforms. Although agricultural advice in Eastern Germany is provided by private organizations, in each case the state maintained a role in subsidizing the costs of advisory provision. Additionally, advisory rings are complementary to the above-mentioned three models in many German states.

Chamber of Agriculture in Rheinland-Pfalz

One of the main providers of agricultural advisory services in Rheinland-Pfalz is the Chamber of Agriculture Rheinland-Pfalz. It is a public corporation, performing its functions in line with the law "On the Chamber of Agriculture Rheinland-Pfalz" of 28 July 1970. Members of the Chamber are farmers, winegrowers, horticulturists and forest owners from the state Rheinland-Pfalz. The main decision-making body of the chamber is the annual general meeting. It is composed of democratically elected representatives of the agricultural sector, who work on a voluntary basis. The Chamber employs about 300 agricultural experts.

¹⁶⁶ Data received upon request from the Agricultural Advisory Center in Brwinów.

The law “On the Chamber of Agriculture Rheinland-Pfalz” states that the Chamber can take over a range of official duties from the responsible state Ministry. Their costs are to be refunded by the state.

Table 8.4

State budget expenditures from the budget of Rheinland-Pfalz directed to the Chamber of Agriculture as refunding for official duties

Year	2004	2005	2006
Expenditures (Euro)	5 870 000	5 733 587	5 430 000

Source: Ministry of Economy, Transport, Agriculture and Viniculture of the state Rheinland-Pfalz

For other kinds of services, including advice on farm management, the Chamber charges fees from farmers. Apart from that, members of the Chamber pay contributions dependent on the basis on which the land tax is calculated. It should be noted that the budget of the Chamber for the year 2007 foresees the total receipts amounted to EUR 24 310 000.

Apart from the Chamber, there are six state Service Centers for Rural Areas in Rheinland-Pfalz with 1 600 employees (2004), who are responsible for agricultural schools, trials, plant protection as well as advice on production technology and nutritional consultation. Due to such wide spectrum of services, it is impossible to specify what part of the state funds directed to the Centers is earmarked for agricultural advisory. The responsible Ministry does not conduct such statistics.

Table 8.5

State budget expenditures from the budget of Rheinland-Pfalz directed to the Service Centers for Rural Areas

Year	2004	2005	2006
Expenditures (Euro)	75 551 300	73 448 900	73 927 400

Source: Ministry of Economy, Transport, Agriculture and Viniculture of the state Rheinland-Pfalz

State Agricultural Offices in Bavaria

There is a public agricultural advisory system in Bavaria. 47 agricultural offices across Bavaria, financed by the state, offer free of charge advisory services to farmers. The state system in Bavaria employs about 550 advisors, who, along with advisory, carry out many non-advice duties related to agriculture as auditing of support measures or teaching. According to the Ministry of Agriculture and Forestry in Munich, every advisor invests about 30% of his time into the advisory related activities. One should bear in mind that with the state funds all services provided by the state advisors are financed, and for that reason the sum of funds earmarked for the state advisory system can not be stated. Again, the responsible Ministry does not conduct such statistics. The farmers’ organizations,

which provide agricultural advisory services to farmers particularly in the fields of organic farming and horticulture, were supported by the state with the amount of EUR 4 500 000 in average in the last three years.¹⁶⁷

While the chambers of agriculture receive state funding only for certain activities they carry out for the government, the state subsidies in case of the Bavarian offices flow into their budgets regardless of the kind of service/advice provided. That means that farmers in Bavaria receive free of charges advisory services with an area-wide offer. In Germany, such system remained in place in Bavaria only.

However, other trends can be noticed as well. In its new concept called a joint advisory system (Public Private Partnership, PPP), the state foresees the involvement of non-governmental and private advisory providers in the existing advisory system. The private partners for the PPP system will be chosen under a special selection procedure. State advisory teams (located at the agricultural offices in the various counties) will take over leadership and control functions within the PPP system.

Private organization in Mecklenburg-Vorpommern

Among the new federal states with predominantly private advisory systems, Mecklenburg-Vorpommern is a special case as the state decided to establish an own company, which would provide competent agricultural advisory services for affordable fees to farmers. The LMS GmbH-Center of Agricultural Advice Service for Mecklenburg-Vorpommern-Schleswig-Holstein Ltd, founded in 1991, is a publicly-limited company. It belongs to the state Mecklenburg-Vorpommern (64,8%), the farmers' association of Mecklenburg-Vorpommern (25,2%) and the horticulture association (10%), so it is part government-owned and part privately-owned. It has its head office in Bad Doberan and four branch offices.

The LMS provides a wide range of charged services to farmers including inter alia carrying out of a full economic analysis of the farm, advice on production technology, supporting the implementation of quality standards, transition process into organic farming, etc. First counseling interview is free of charges and can be requested via Internet.

Also, similarly to the chambers of agriculture in other German states and on the basis of the law, the LMS performs official duties for the government of Mecklenburg-Vorpommern, which include inter alia advice on land protection and control of biological waste circulation. The costs of these tasks are refunded by the state. Apart from that, the state subsidizes advice to farmers inter alia in the fields of the environmentally sound horticulture, immission control, organic farming and introduction of quality assurance measures. The fields of advice to be subsidized are determined together by the LMS and the responsible state au-

¹⁶⁷ Data received upon request from the Agricultural Advisory Center in Brwinów.

thority and adjusted on a regular basis. Additionally, professional socio-economics assistance to farm enterprises which experience social and economic difficulties are subsidised by the state to 100% of the costs. As a result, such advice is provided by the LMS for farmers free of charges.

In 2006, the amount of state budget expenditures directed to the LMS amounted to EUR 930 000.¹⁶⁸ This amount does not include the refunding of the costs of official duties. According to the Ministry of Agriculture, Environment and Consumer Protection of the state Mecklenburg-Vorpommern, the amount will not change much in the next years.

Advisory rings in Schleswig-Holstein

Advisory rings as a form of farmers' organization exist alongside other providers of agricultural advisory services: the state, Chambers of Agriculture and private companies in many German states. Advisory rings are incorporated associations of farmers with similar farm enterprises or similar problems who group together to employ one or several agricultural advisors. An advisory ring must be registered and is required to have a board, elected by the members. The task of the board is to contract an advisor, negotiate on salary and resources and to supervise his job.

In the state Schleswig-Holstein, there are nearly 50 advisory rings with 100 advisors and approximately 4 900 farm enterprises as members (2007).

Their members pay a financial contribution to finance the system. It can be determined depending on the size of the farm or the number of animals, or the members may pay a fixed fee regardless of the size of the enterprise. Finances are supplemented by fees charged for services above a basic provision. Until 2004, the advisory rings in Schleswig-Holstein received financial support to staff and resource costs from the state budget.

Table 8.6

State budget expenditures from the budget of Schleswig-Holstein directed to the regional advisory rings

Year	2002	2003	2004	2005	2006
Expenditures (Euro)	1 091 100	989 000	244 000	0	0

Source: the Ministry of Agriculture, Environment and Rural Areas of the state Schleswig-Holstein

As there was no financing in 2005 and 2006, we included the year 2002 and 2003 in the table to make the picture full. As can be seen, the trend was to decline the funds from year to year, and in 2005 the state ceased to support the advisory rings.

¹⁶⁸ Data received upon request from the Ministry of Agriculture, Environment and Consumer Protection of the state Mecklenburg-Vorpommern.

Conclusions

The countries and regions described above can be grouped into various models of agricultural advisory systems' organization. In the first one, we have public financing of advisory services delivered by public bodies (Poland, Bavaria) or at least public co-financing (the Chamber of Agriculture in Rheinland-Pfalz) whereas in the second one both the provision and financing of advisory services are private (Denmark). The third model is characterized by private provision of advisory services but the state maintains its role in subsidizing their costs (Mecklenburg-Vorpommern).

The above analysis leads to following conclusions:

- 1) There has been a trend, perceptible throughout various advisory systems, of multiple partners in providing of agricultural advisory (diversification), leading to greater competition on the market for agricultural advisory services.
- 2) There is also a trend towards farmer-controlled organizations. The basic idea is that farmers should determine the provision of services according to their demand and have a voice in organization and management of the advisory system. Farmers are involved in the management of agricultural services providers both in the private and public system (see for example the relevant committees in Denmark and Poland) or they set up their own organizations (e.g. advisory rings in Germany, chambers of agriculture in Poland).
- 3) It can be observed that the role of the state in the provision of agricultural advisory services has been reduced. Even in countries with small-scale farm structures this trend can be observed. Bavaria is in a process of rethinking its system of state agricultural advisory services. However, the state advisory centers remain the main provider of agricultural advisory in Poland.
- 4) Development of new forms of financial support for advisory services and the trend to mixed sources of funding can be noticed. It is not all about EU funds as additional source of funding. For example, law makers in Poland enabled the state agricultural centers to charge fees for certain services, that is to act as private companies.
- 5) Experience of Denmark and the Netherlands shows that all agricultural advisory services can be privatized with benefits for farmers and the state budget at the same time. However, in Western Europe many services of this kind remain subsidized by the state also in cases where the state is not an advisory provider. The trend in Western Europe is towards public financing for those services that are of direct concern to the public and towards direct charging for specific individual services with direct return for the farmer (in the form of improved income).

6) It is recognised that larger farms can afford to pay for agricultural advisory services and it is recognised as well that public financial support of agricultural advisory systems guarantees easier access to advice for smaller agricultural enterprises that otherwise would not be able to afford advisory services. In this way disadvantaged groups are not alienated. Thus, advisory services contribute to achievement of socio-economic and rural development objectives. Such measures are of importance particularly in countries or regions with rural poverty.

By adopting the law "On Agricultural Advisory Activities", Ukraine already committed itself to a non-public (non-state) agricultural advisory provision with partly public financing. Provision of certain services, called socially-oriented services, will be financed by the state. As a result, certified private organizations will apply for the funds under a tendering procedure and then provide agricultural advisory services to their customers free of charges. Other services will be rendered at the customer's expense.

As regards the amount of public subsidies earmarked for agricultural advisory services, there is 9,3 million of UAH foreseen for this purpose in the Ukrainian state budget for 2007 and 19,5 million of UAH in the draft budget¹⁶⁹ for 2008. How does this compare to Western Europe?

Mecklenburg-Vorpommern subsidized agricultural advisory services with EUR 930 000 in the last year, equivalent to about UAH 6 593 700.¹⁷⁰ Taking into account that there are approximately 5 230 farms over two hectares in the state of Mecklenburg-Vorpommern, it makes UAH 1 261 per farm. To reach such a number in Ukraine, with about 43 000 households and private family farms and about 20 000 corporate large scale farms, the state would have to subsidize its system with about UAH 79 443 000.¹⁷¹ This does not yet include about 6 million households with land plots up to 2 hectares.

In the short term, we recommend making the legislative basis for the provision and financing of agricultural advisory services in Ukraine complete as still an order (prikaz) on the terms of the tender procedure is missing. It should be adopted as soon as possible by the responsible Ministry of Agricultural Policy as it is a prerequisite for disbursement of the public funds. The resolution of the Cabinet of Ministers on the allocation of the funds for the year 2008 should be adopted without delay. It should be noted that the Ukrainian policy makers can increase the public funding directed to the agricultural advisory system and still remain in line with WTO requirements. Agricultural advisory services fall under

¹⁶⁹ Draft Law of Ukraine "On the State Budget of Ukraine for the year 2008" of 14 September 2007.

¹⁷⁰ Exchange rate to Euro of 10 October 2007 — 7,09 UAH.

¹⁷¹ The estimation is near to the estimation of the National Association of Agricultural Advisory Services of Ukraine Dorada. According to the association, nearly UAH 74 000 000 are needed for the support of extension and agricultural services in Ukraine in 2007.

Green Box measures which means that no restrictions exist for such a type of support of agricultural producers.

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Part III: Sub-Sector Policies — Sugar, Grain, Dairy

9. Restructuring of the Sugar Sector in Ukraine

The objective of this paper delivered in early 2006 was to develop recommendations for restructuring the sugar sector in Ukraine taking into consideration international sugar market developments, future WTO membership of Ukraine and lessons from other Eastern European countries. This study was requested by the Ministry of Agrarian Policy. The paper first analyses the current state of the sugar sector in Ukraine with particular emphasis on the analysis of the variation of efficiency in sugar beet and sugar production at different locations as well as between different sugar beet growers and sugar factories in Ukraine. The international part of the working paper starts with a description of recent world market trends and the impact of the EU sugar market reform. Three case studies from Poland, Eastern Germany and Moldova complete the picture with important experiences and lessons learnt. The study ends with conclusions and specific recommended actions for the Ukrainian Government.

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Introduction

The overall objective of this working paper is to develop recommendations for restructuring the sugar sector in Ukraine taking into consideration international sugar market developments, future WTO membership of Ukraine and lessons from other Eastern European countries.

The development of recommendations for the sugar sector has been requested by the 1st Vice Minister Ivan Demtshak of the Ukrainian Ministry of Agriculture Policy based on the decision of the Cabinet of Ministers dated 24th December 2005 "On Approval for the Development of a Restructuring Programme for the Sugar and Sugar Beet Sectors for the Period until 2010". The analysis and development of recommendations involved various experts from the private and public sector in Ukraine and Germany. The German Federal Ministry of Agriculture provided expertise to report on the latest developments of the reform of the EU sugar market. The sugar industry in Germany provided valuable information on the restructuring of the sugar sector in Eastern Germany, Moldova and Poland as well as on recent world market trends. The sugar industry and sugar beet growers in Ukraine have been involved with the Ukrainian Agrarian Confederation and the Ukrainian Sugar Association UKRZUKOR. The project team took part in various meetings, seminars and conferences to identify the needs of the sector. The project team further analysed various statistics provided by Ukrainian public authorities, available at the Institute and various other sources. This work builds upon previous studies of the Institute for Economic Research and Policy Consulting as well as policy papers of the German Advisory Group. The study team significantly extended the analysis of the issues by applying different methods at farm and factory level. This concerns in particular analysis of gross margins, efficiency coefficients and density functions.

The paper first analyses the current state of the sugar sector in Ukraine with its production and consumption, efficiency, market regulations and trade. The study team put particular emphasis on the analysis of the variation of efficiency in sugar beet and sugar production at different locations as well as between different sugar beet growers and sugar factories in Ukraine.

The international part of the working paper starts with a description of recent world market trends and the impact of the EU sugar market reform. Three case studies from Poland, Eastern Germany and Moldova complete the picture with important experiences and lessons learnt. The study ends with conclusions and specific recommended actions for the Ukrainian Government.

The analyses of future energy market opportunities for the sugar industry, impact on input markets (seed, fertilizers, agro-chemicals) as well as the analysis of isoglucose markets were outside the scope of this study.

The sugar sector in Ukraine

Sugar beet production

Sugar beet has been the major resource base for domestic sugar factories. Thus, the competitiveness and efficiency of sugar beet production in Ukraine is one of the most important questions to be considered for sustaining the whole sugar value chain.

Despite high production of the sector during the Soviet times (Ukraine was the biggest producer of sugar and consequently of sugar beet in the former USSR), transition to the market became the real challenge for beet sugar production. Due to loss of former Soviet Union markets and limited international competitiveness production of sugar beet fell by almost two-thirds since the beginning of transition, from 44.3 m t of sugar beets in 1990 to 15.6 m t in 2005 (Table 9.1).

Table 9.1
Production of sugar beet in Ukraine, 1990—2005

	1990	1995	2000	2001	2002	2003	2004	2005	2006*
Seeding areas, thd ha	1605.4	1022.1	855.6	970.3	896.6	773.4	732.0	625.5	667.0
Yield (simple average), t/ha	27.57	15.63	17.67	18.26	18.93	20.12	23.80	24.97	22.53
Gross harvest, m tons	44.3	14.1	13.2	15.6	14.5	13.3	16.6	15.6	15.4

Source: State Statistics Committee of Ukraine, Ukragroconsult.
* 2006 preliminary estimates.

This decline, however, has not been stable. After the ever-lowest harvest in 2000 the sector somewhat improved its performance, yet, there has been no clear positive trend. However, slightly increasing seeding areas and growing yields look encouraging, signaling some positive adjustments in the sector.

It should be noted that yield records in Table 9.1 are only simple average estimates and they do not capture the whole variability of yields within the sector. The weighted average yield (weighted by the production shares) provides more accurate estimates, which, according to our estimations was considerably higher than simple average in 2004, i.e. 30.91 t/ha versus 24.97 t/ha.

The estimated distribution of yields in 2004 (Figure 9.1) shows a huge dispersion, with a bulk of producers ranging from very low yields to some 30—40t/ha, and a few achieving yields of 40t/ha or more. The mode of the distribution is at 16.95t/ha, showing that the majority of producers had yields in the proximity of that estimate in 2004. If we consider the areas under sugar beet grouped accord-

ing to the yield bands (as in Table 9.2), one would notice a positive correlation between the areas harvested and yields. In other words, producers cultivating more sugar beet were capable to achieve higher yields. However, this result should not be misinterpreted to assume that large-scale production of sugar beets is generally more productive, since as Table 9.2 also witnesses, producers having the same land area under sugar beets perform differently, with yields belonging to the “worst” as well as to the “best” performing producers.

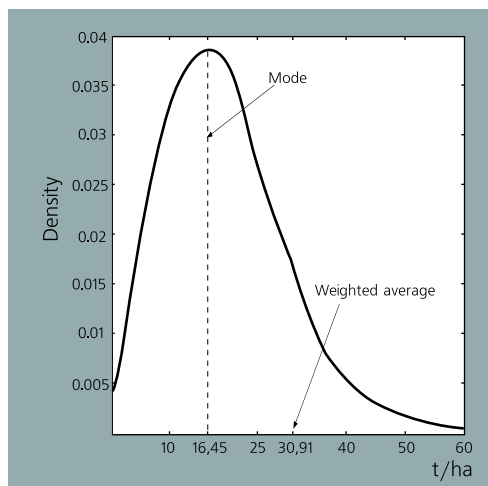


Figure 9.1
Estimated distribution of farm sugar beet yields, 2004.¹⁷²

Table 9.2
Distribution of areas harvested according to yield bands, 2004

Yield, t/ha	Area harvested, ha			
	Min	Mode	Mean	Max
0-10	2	19.7	63.9	2437
10-20	1	30.1	100.6	1823
20-30	1	60.0	147.8	2265
30-40	2	68.3	194.4	3854
40-50	2	105.4	275.7	1615
>50	10	114.7	309.1	2114

Source: Own estimations based on IER database.

Figure 9.2 shows the estimated distribution of farm level output technical efficiency scores in the sector.¹⁷³ Efficiency scores show how far producers are located from the best producers given production costs they have. In other words,

¹⁷² We used kernel density estimation using Gaussian density as a kernel function (see Annex A.1 for details).

¹⁷³ Technical efficiency scores were estimated using Data Envelope Analysis (DEA) with one output (Output) — two inputs (Land, Gross value of inputs) model. For the method description see Annexes A.2 and A.3.

the best producers have 100% efficiency ("1" efficiency score as in Figure 9.2), the worst producers are located to the left from 1. So, if a producer has 0.8 efficiency score (or 80% efficient), it is said that he can expand the output by 20% further at the same costs by improved farm practice, adjusting capital/labour ratios and enhanced farm management.

As Figure 9.2 reveals, the majority of sugar beet producers are only efficient at a level of 43%. Despite a slightly higher weighted average efficiency score (59%), it is evident that domestic producers underutilise their potential, or use resources at hand inefficiently. It occurs due to various reasons, e.g. poor farm management, sub-optimal farm practices (low quality seeds, high seeding density, low input use), inadequate machinery etc. outside the scope of this paper. So potentially, provided enhanced efficiency, Ukraine could have produced about 26.94 m t of sugar beet, i.e. about 10 m t more than actually produced, at the same costs in 2004.

Figures 9.3 and 9.4 provide information on the costs of producing sugar beets. One might notice that the majority of farms invested about UAH123/t or UAH 2392/ha of sugar beet. The average figure was about UAH176/t or UAH 2782/ha of sugar beet in 2004. The distribution of costs is rather broad, ranging somewhat near UAH 1000/ha to more than 5000 UAH/t. Unsurprisingly, producers putting more money into production received higher yields. Table 9.3 shows a positive correlation between production costs and yields (i.e. mode and mean of the production costs distribution of each yield band show a positive trend). So, producers achieving more than 50t/ha yield spent UAH5532/ha, and the majority within this yield band spent UAH5177/ha.

In a further step we compared the above production costs with world market prices to infer whether and how many sugar beet farmers would be competitive on world markets, assuming an efficient sugar processing industry. Figure 9.3 shows the theoretical sugar beet world market price (UAH165/t) deducted from the sugar world market price (EUR192/t) in 2004 assuming an average EU extraction rate coefficient (13%). It may be concluded that about half of the Ukrainian sugar beet growers would have been produced competitively.

From the above analysis it can be concluded that a huge efficiency potential exists not only through investments but also through improved farm practices and farm management. It may further be concluded that discussions on average production costs are of limited use because of the broad variation of production costs.

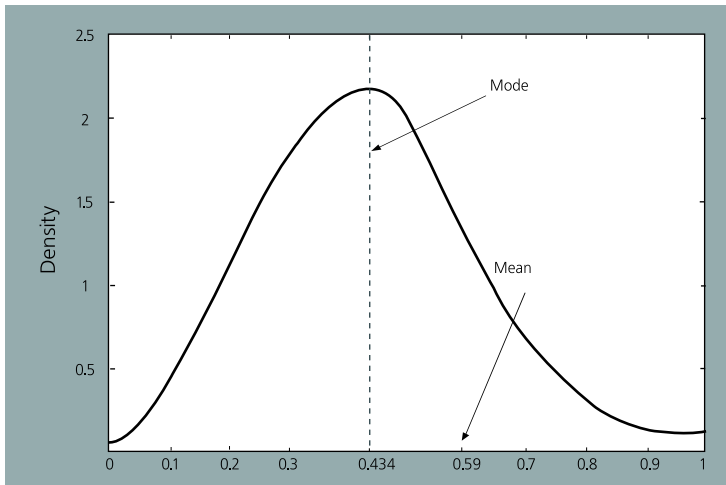


Figure 9.2
Estimated distribution of farm efficiency scores, 2004.
Source: Own estimations based on IER database.

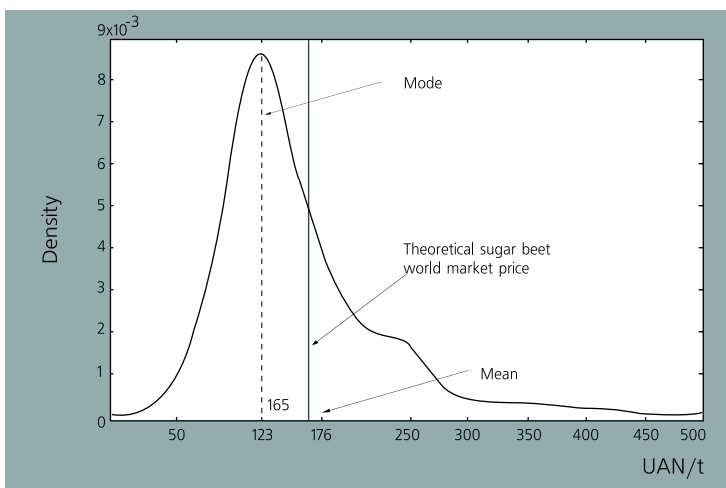


Figure 9.3
Estimated distribution of sugar beet production costs per ton, 2004.
Source: Own estimations based on IER database.

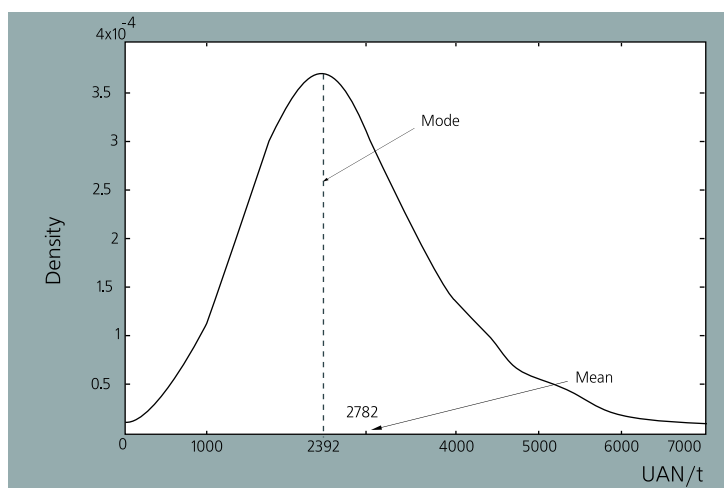


Figure 9.4
Estimated distribution of production costs per hectare, 2004.
 Source: Own estimations based on IER database.

Table 9.3
Distribution of production costs according to yield bands, 2004.

Yield, t/ha	Production costs, UAH/ha	
	Mode	Mean
0-10	1442	1814
10-20	2184	2468
20-30	2732	3050
30-40	3792	3874
40-50	4399	4627
>50	5177	5532

Source: Own estimations based on IER databas.

Analyzing the regional pattern and efficiency of sugar beet production map 1 shows that production is mostly concentrated in the Central part of Ukraine. Vinnytska, Poltavaska, Cherkaska, Kyivska have been the leading oblasts by volumes and land areas under sugar beet. The same relates to yields, except Kherson oblast, which gives the highest weighted average yield. However, the efficiency of production scores does not go in line with other figures among oblasts on the map. For example, Dnipropetrovsk region had approximately the same efficiency score as Vinnytska or Poltavaska oblasts in 2004, although natural conditions are less favorable for sugar beet growing in Dnipropetrovsk. Although it would require additional studies to analyze this phenomenon in detail, one conclusion is still possible: availability of good natural potential does not necessarily guarantee efficient use of it.



Notes:

- Oblast's name
- 41% — Oblast aggregate efficiency score, %
- (23.46) — Weighted average sugar beet yield (weighted by production shares), t/ha
- <25.2> — Sugar beet harvested area, thd ha

Map 1

Regional distribution of sugar beet production in Ukraine.

Source: Own presentation and estimates using IER database.

Competitiveness of sugar beet production vis-a-vis other crops

The relative competitiveness of sugar beet production against other crops plays a decisive role in the future of the sugar production value chain. The trend shown in Table 9.1 is mainly explained by the fact that Ukrainian farmers have been reducing the seeding areas under sugar beet opting for more profitable and less capital-intensive crops such as grains and oil seeds. So, it is important to know conditions (price, yields etc.) under which sugar beet production is competitive within Ukrainian farms from the farmers' point of view.

To analyze competitiveness of sugar beet production we apply gross margin calculations.

The gross margin per hectare is defined as the revenue per hectare plus any revenues from the sale of by-products plus any relevant subsidies per hectare, minus the sum of all variable costs. The results show the marginal competitiveness of crops, i.e. if a farmer had additional land and other production factors available the gross margin would give him an indication in which crop to invest. In the long-term perspective, however, gross margins must be adjusted for fixed costs such as purchasing machinery or labor costs. Due to the data limitation at hand we are not able to extract a "clean" gross margin figure. For example, data on revenues from the sale of by-products and the potential impact on subsequent crops are lacking. However, we can approximate gross margins with a sufficient degree of accuracy required for the comparison of the profitability of different crops (see Annex C for data description). We carried out these calculations for six crops: sugar beet, sunflower seed, rapeseed, wheat, barley, and corn.

From the results presented in Figure 9.5 to 9.8 we may draw the following conclusions. Figure 9.5 shows that other crops outperformed sugar beet in terms of gross margin in 2004. More probability mass is located in the negative segment of the gross margin scale, suggesting that producers have greater risks of incurring losses with sugar beet vis-à-vis other crops. The "champions", as expected, were sunflower and rape seed. Of course, as Figure 9.5 shows, there are some producers having similar gross margins with sugar beet as with other crops, but this can be achieved under the conditions considered below.

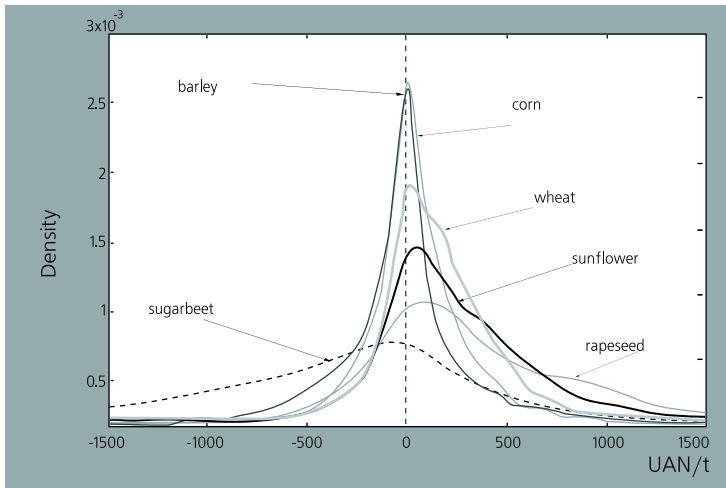


Figure 9.5
Estimated distributions of gross margins for different crops in Ukraine.
Source: Own presentation based on IER database.

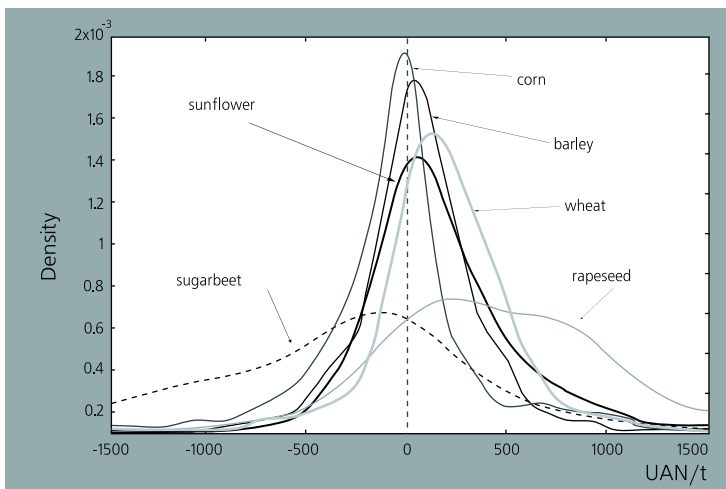


Figure 9.6
Estimated distributions of gross margins for different crops in Vinnytska oblast.
Source: Own presentation based on IER database.

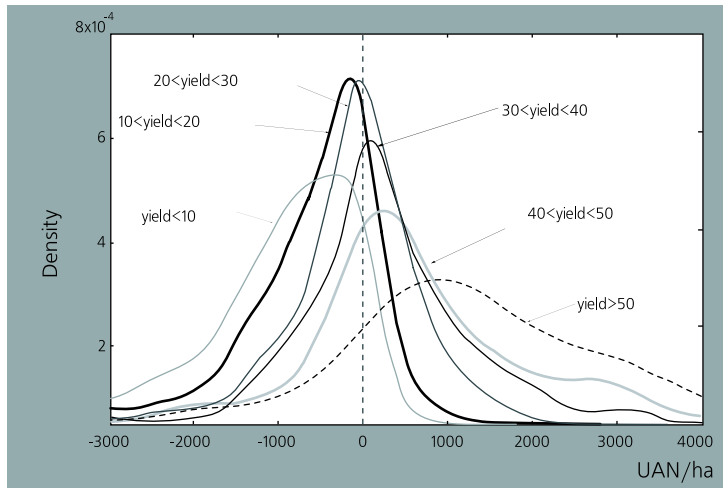


Figure 9.7
Estimated distributions of gross margins for sugar beet within different yield bands in Ukraine.
 Source: Own presentation based on IER database.

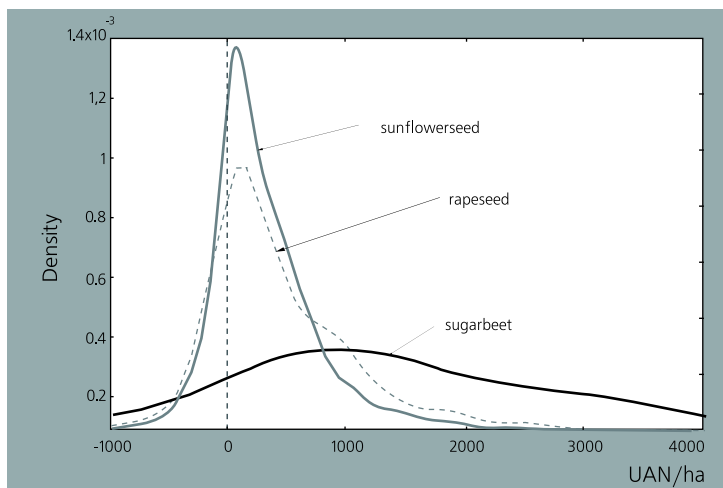


Figure 9.8
Estimated distributions of gross margins for sugar beet within ">50 t/ha" yield band vs. other crops.
 Source: Own presentation based on IER database.

Location-specific factors (soil, rainfall distribution) are expected to be important suggesting that sugar beet might be more competitive vis-à-vis other crops in the most favorable sugar beet growing areas. Unfortunately, we did not find justification for such argument. We analyzed Vinnytska oblast — the leading area in terms of sugar beet production and natural conditions for sugar beet growing (see Figure 9.6) — and compared gross margin scores for crops in that oblast. As a result we received a similar picture as for the whole Ukraine. Sugar beet gross margin distribution for Vinnytska oblast shows a similar pattern compared to the whole Ukraine pattern. The only exception is rapeseed, clearly improving its competitiveness in this oblast. Two important conclusions follow from these results. First, favorable nature conditions for sugar beet growing might not necessarily lead to higher competitiveness. Second, provided that the sugar beet production performance indicators do not improve, other crops (especially rape seed) will gradually “squeeze out” sugar beet production.

If we group gross margins of sugar beet production according to the yield bands (see Figure 9.7) it becomes obvious that high yield producers having higher scores. Figure 9.7 shows that if we move from the lowest to the highest yield bands we receive more probability mass in the positive sector of the gross margin scale. Moreover, as Figure 9.8 witnesses, sugar beet production achieving more than 50t/ha yield might be even more competitive than, say, rape seed or sunflower seed from the farmers perspective. These results are basically consistent with previous studies, for example Benecke and Cramon-Taubadel (2001). This leads to the conclusion that increasing sugar beet yields is a necessary pre-condition to sustain sugar beet and sugar production in Ukraine. Efficiency gains in sugar beet production are a key element to make the whole sugar production value chain more efficient. However, the interpretation of gross margins as a competitiveness indicator on farm level should not be misinterpreted with international competitiveness. Even with efficient sugar beet production beet sugar production is uncompetitive from the national point of view, because in this view the costs of national sugar production, including sugar beet production, have to be compared with opportunity costs on world markets (see next sections for further details).

Structure of the sugar beet producers

There are more than 3000 agricultural enterprises producing sugar beet in Ukraine. However, as Table 9.4 shows, their share in the total production volume gradually decreased in the course of transition to about 77%, and households produced the rest of 23% in 2004. Most of the enterprises producing sugar beet are private (75% of the total volume in 2004) for the time being, whereas the state owned enterprises produced about 1.5% of the total sugarbeet volume. Table 9.4 also provides some information on the shares of each enterprise type

in the total production where private companies take the leading position producing about 42%. These are joint stock or limited liability companies, increasingly vertically integrated with sugar holdings processing and marketing sugar.

Table 9.4
Structure of sugar beet producers by production shares, %

	1995	2000	2001	2002	2003	2004
Agricultural Enterprises	97.4	87.8	79.7	73.8	77.4	76.9
Private:	Na	Na	Na	Na	Na	75.3
Companies (of different types)	Na	Na	Na	Na	Na	42.1
Private farms	Na	Na	Na	Na	Na	22.4
Cooperatives	Na	Na	Na	Na	Na	7.2
Others	Na	Na	Na	Na	Na	3.6
State:	Na	Na	Na	Na	Na	1.5
Households	2.6	12.2	20.3	26.2	22.6	23.1

Source: State Statistics Committee of Ukraine and own estimates based on IER database

Sugar production

Ukraine inherited from the former USSR a huge sugar industry with almost 200 sugar factories producing more than 5 m tons of refined sugar per year in the beginning of the transition. However, in the course of transition the sector output dropped below 1.8 m tons, recovering somewhat to 1.91 m tons last year. We might infer from the sugar balance in table 9.5 that current domestic production of beet sugar is not sufficient to cover domestic demand, placing Ukraine in a net-import situation.

Table 9.5
Sugar balance in Ukraine, 2002—2005 marketing years, m t

	2002/03	2003/04	2004/05	2005/06
Beginning stocks	0.14	0.12	0.17	0.15
Production of refined beet sugar	1.41	1.44	1.77	1.91
Import of cane sugar	1.34	0.59	0.50	0.45
Production of refined cane sugar	0.74	0.68	0.48	0.21
Total domestic production	2.15	2.12	2.25	2.12
Total import	1.72	0.97	0.68	0.60
TOTAL SUPPLY	2.67	2.62	2.32	2.59
Total export	0.50	0.33	0.32	0.30
Domestic industrial consumption	0.57	0.63	0.67	0.73
Domestic human consumption	1.48	1.48	1.47	1.47
TOTAL DOMESTIC CONSUMPTION	2.05	2.11	2.14	2.19
Ending stocks	0.12	0.17	0.15	0.10

Source: UkrAgroConsult(2005),

The efficiency of the sugar value chain depends on sugar beet production as raw material, but also on the efficiency of sugar processing itself. The number and density of sugar factories in Ukraine is extremely high compared with other European countries (Zorya and Nivyeviskiy, 2005). For example, Vinnytska oblast has about 35 (23 operating so far), whereas Germany (with about twice the Ukrainian production volume) has only 26 sugar factories. Out of 190 factories, 119 are currently operating and 71 sugar factories are closed. 30 sugar factories have already been liquidated so that the total number of sugar factories in Ukraine is currently 160. The remaining factories effectively operate less than 90 days per campaign/year leading to huge fixed costs of production and thus lower competitiveness. The average sugar plant in Ukraine processes about 2700 tons of sugar beet per day, which is about three times less than in Europe. Only 14 out of the 119 left factories in Ukraine have more than 5000 t daily capacity. The average daily capacity of the restructured East Germany sugar industry is about 11000 t per day.

As the competitiveness of sugar production — besides cost efficient production of sugar beets — is mainly determined by realising economies of scale by maximising the number of campaign days, the daily capacity of the processing plant and the efficient use of energy, it is evident that the sugar industry itself has to significantly improve efficiency.

Current capacity of the Ukrainian sugar industry is estimated at 0.32 m tons of sugar beets per day, or around 37 thd tons of refined sugar per day. So, to process the 2004 harvest, provided full capacity utilization, Ukrainian sugar plants would have needed around 50 days. However, due to practical technical problems, the sugar campaign lasted about 61 days (see Table 9.6).

Looking particularly at the variability of sugar production performance indicators provides additional insights. Figure 9.9 shows the estimated distribution of the plant beet sugar production volumes. The majority of factories produced around the vicinity of 12.4 KMT in the 2004 campaign, although there was a group producing around the vicinity of 40 KMT and one refinery produced more than 60 KMT.

In the next step we analyzed those factories located in the shadowed area of the production scale (because of incomplete data sets). Altogether, the chosen factories produced about 70% of the total sugar output in 2004. The results show that although there were several factories over-utilizing their capacities the majority of factories utilized their daily capacities by around 91%, and the average capacity utilization score was 82.6% in the 2004 campaign.



Map 2
Distribution of sugar factories in Ukraine
Source: Zuckerwirtschaft Europa (2006).

Table 9.6
Some performance indicators of the sugar industry in Ukraine, 2004

Oblast	Procured sugar beets, m MT	Processed sugar beets, m MT	Production sugar, m MT	Extraction coeff., %	Avg. daily capacity, KMT	Avg. campaign period per factory, days	Number of factories *)	
							Operated	Closed
Vinnitsia	2.5	2.4	0.3	10.9	1.9	64.3	23	17
Volyn	0.9	0.8	0.1	12.2	3.8	62.3	4	0
Zhytomyr	0.6	0.6	0.1	11.2	1.9	66.8	5	1
Kyiv	1.7	1.6	0.2	11.4	2.0	67.1	14	2
Kirovograd	0.6	0.6	0.1	12.2	2.6	58.8	4	7
Lviv	0.5	0.5	0.1	11.8	3.8	43.1	3	2
Mykolaiv	0.2	0.2	0.0	10.8	5.0	58.8	1	1
odessa	0.5	0.5	0.0	10.5	2.9	61.1	3	0
Poltava	1.6	1.6	0.2	11.9	2.8	78.5	8	3
Rivne	0.5	0.5	0.1	11.8	2.4	59.6	4	2
Sumy	0.7	0.6	0.1	12.6	1.9	63.0	6	11
Ternopil	1.4	1.3	0.1	11.0	3.7	49.4	8	1
Kharkiv	1.6	1.6	0.2	12.1	2.6	75.6	10	2
Khmelnyskiy	0.9	0.9	0.1	11.5	2.2	44.3	10	6
Cherkasy	1.2	1.2	0.1	10.8	2.2	60.4	10	13
Chernihiv	0.5	0.5	0.1	12.8	1.6	85.5	4	1
Chernivtsi	0.2	0.2	0.0	11.0	2.4	43.8	2	2
Ukraine	16.0	15.5	1.8	11.6	2.7	61.3	119	71

Source: Ukrtsukor (2005) *) 30 are liquidated

The sugar extraction coefficient may be taken as a further efficiency indicator of sugar beet processing in Ukraine. As Figure 9.11 shows it is characterized by broad variability and is ranging from about 7% to some 13% within the group considered in the 2004 campaign. The majority of factories had 11.65% extraction coefficient and the average was about 11% within the group considered. This is comparatively low by international standards. Low sugar content in sugar beets is probably one reason; on the other hand the broad variation of extraction coefficients (from 7% to 14%) proves the high potential for efficiency improvements of factories in Ukraine.

The distribution of plant campaign days gives an indication of the provision of factories with sugar beets. Figure 9.12 shows a huge variability. Some factories processed sugar beets in less than a month, but some were able to operate more than a hundred days. The majority of factories within the group considered operated about 71 days, and the average campaign was 66 days. As the number of campaign days is one of the decisive factors of the profitability of sugar production also this result shows a high potential for improvement of raw material supply.

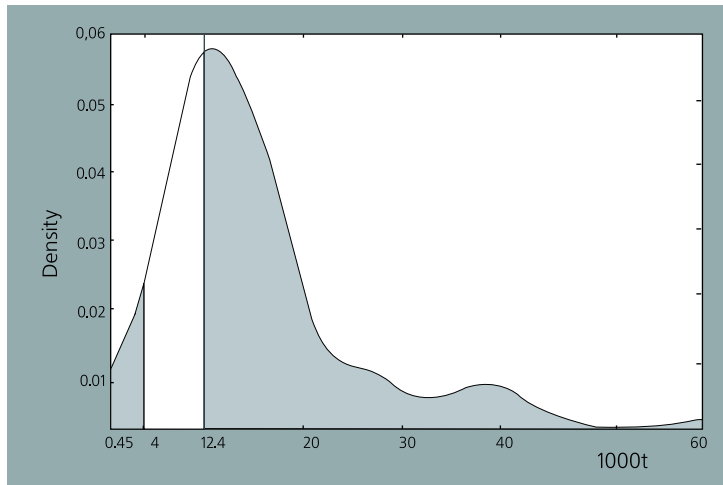


Figure 9.9
Estimated distribution of plant beet sugar production.
Source: Own presentation.

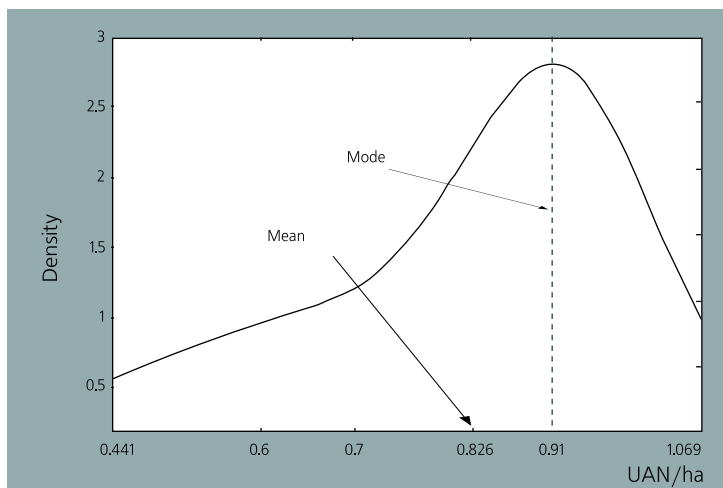


Figure 9.10
Estimated distribution of daily plant beet sugar production to capacity ratio.
Source: Own presentation.

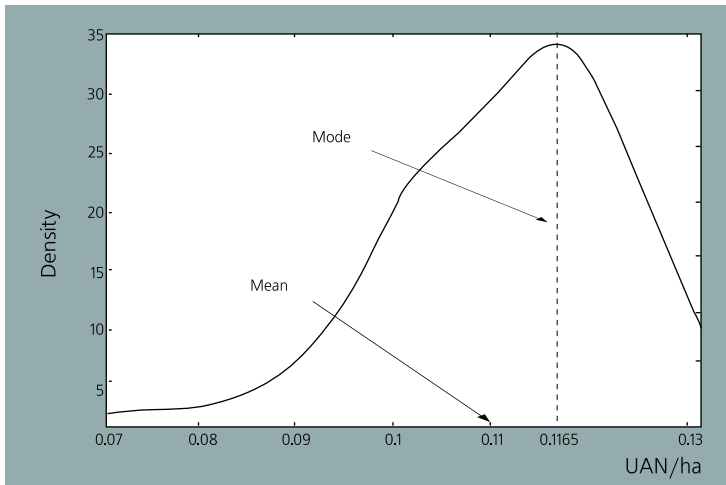


Figure 9.11
Estimated distribution of plant sugar extraction coefficient.
Source: Own presentation.

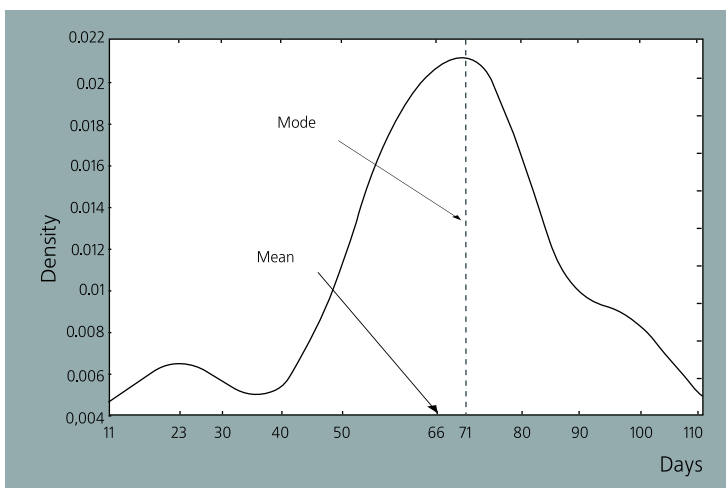


Figure 9.12
Estimated distribution of plant campaign days.
Source: Own presentation.

Structure of the sugar industry

The sugar industry in Ukraine has been fully privatized. Table 9.7 shows the current structure of the sector. There are two leading sugar holdings producing about 25 % of the market share, followed by some medium-sized companies. Despite fewer sugar processing plants in possession, UkrRos seems more technologically advanced than UPK, having close to its rival market share figures. The same applies to the quickly growing companies Astarta-Kyiv and UkrPromInvest. None of the companies has a dominating market share. Foreign investors have been kept outside for the time being.

The leading sugar holdings can be characterized as financially strong, usually also involved in other businesses and sectors. Vertical integration is increasing with a tendency to extend operations from sugar production and marketing also to sugar beet production to ensure raw material supply as the decisive factor for making the whole value chain profitable.

Table 9.7

The structure of the sugar industry in Ukraine, 2004 and 2006

Company (major share holder)	No. of plants 2004	No. of plants 2006	Production of sugar, KMT	Market share, % 2004
Ukrainska prodovolcha kompania (UPK)	15	-	229.22	12.82
UkrRos	6	-	198.71	11.11
Astarta-Kyiv	3	5	79.09	4.42
UkrPromInvest/Agro-prodinvest	2	5	75.98	4.25
Dubnotsukor	6		67.85	3.79
SumyAgroTsukor	4		50.92	2.85
InTsukorProm-K	3		49.19	2.75
Euroservice-Ukraine	3		45.42	2.54
Salivonky sugar plant	1		41.14	2.30
Lokhvyytskiy sugar plant	1		38.71	2.16
Other producers	75		911.92	51.00

Source: Ukrtsukor.

Sugar market organization in Ukraine and trade regime

Table 9.8

Basic characteristics of the Sugar Market Organization in Ukraine

	2003/04	2004/05	2005/06
Domestic marketing quota ("A") m tons	1.8	1.8	1.8
Minimum prices:			
Sugar beet UAH/t	165.0	165.0	170.0
White sugar (wholesale, including VAT) UAH/t	2370.0	2370.0	2370.0
Import Duty:			
Sugar	50%, not less €300/t	50%, not less €300/t	50%, not less €300/t
Sugar beet	50%, not less €125/t	50%, not less €125/t	20%
Sugar beet seeds	€22/kg	€22/kg	€22/kg
Machinery	10-40%	10-40%	10%

Source: Own presentation based on Ukrainian legislation

The sugar market organization in Ukraine emulates the EU's sugar market regime, but without export subsidies. The sugar quota was introduced in 2000¹⁷⁴ allocating the overall national quota annually to regions and then to sugar factories and sugar beet growers within each particular region. The allocation of quota has been exercised not on a competitive basis, but according to the Ministry of Agriculture Policy regulation. The main criterion is the contracted sugar beet area per region explaining partly the above tendency towards vertical integration. The quota is not tradable so far, forcing inefficient factories to further produce although it does not make sense either financially (from the factory's point of view) or economically (from the national economy's point of view).

Each year the Government sets the minimum price of white sugar and derives the sugar beet price. Minimum prices are mandatory and if any agent diverts from minimum prices, he is substantially fined. In fact, the volume of quota and minimum prices remained unchanged since 2002.¹⁷⁵ In order to protect high domestic prices, the import tariffs are set at a prohibitively high level (300 €/ton). The fundamental difference between the situation in the EU and that in Ukraine is that the former has a net sugar surplus, while the latter is a net importer of sugar. Since domestic sugar production in Ukraine is lower than domestic consumption, from year to year the Government set temporary import tariff-rate quotas (TRQ) with very low in-tariff rates. In 2003, for example, the Verkhovna Rada of Ukraine authorized TRQ totaling 560 KMT: 200 KMT with a specific import duty of EUR60/t, and additional 360 KMT at EUR6/t. The TRQ for raw cane sugar was auctioned. This method will have to be changed in future to make it consistent with WTO rules.

¹⁷⁴ The Law of Ukraine No. 758—XIV "On State Regulation of Sugar Production and Marketing" as of June 17, 1999.

¹⁷⁵ Resolution of the Cabinet of Ministers of Ukraine # 1977 "On State Regulation of Sugar Production and Marketing", as of December 25, 2002 (with amendments).

Domestic market prices usually equaled minimum prices, which were twice over the indicative world market prices (Figure 9.13). However, mostly due to fact that there was no TRQ opened last year domestic prices surged much higher minimum prices. In the beginning of 2006 there is no TRQ as well and current price jump has also been heated by a considerable world market price increase.

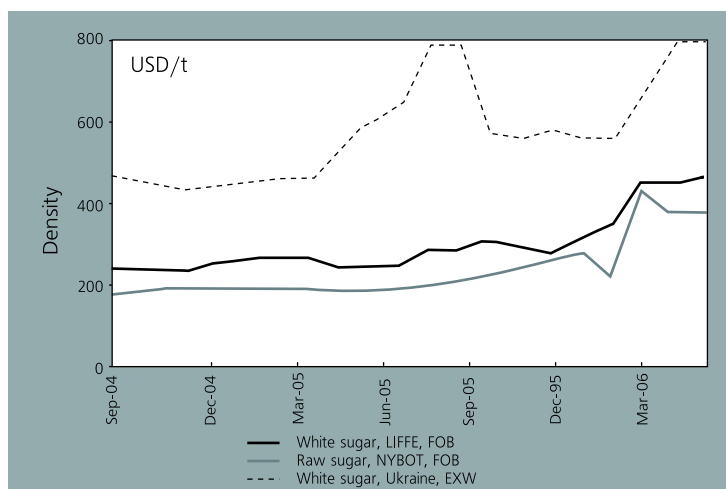


Figure 9.13
Domestic and world market sugar prices, Sep. 2004 — Apr. 2006
Source: Ukragroconsult, APK-Inform.

Table 9.9
Tariff rate quotas for the import of raw cane sugar in Ukraine

Year	Established quota, KMT	Actual imports, KMT
1998	300	96
1999	60	217
2000	260	229
2001	260	260
2003	560	380
2004	125	125
2005	-	-
2006	-	-

Source: State Statistics Committee of Ukraine.
Note: The auctions are held on a competitive base. However, eligible for auctioning participants have to pay an accreditation fee, an auction duty, and transfer in advance the established minimum price of one lot (e.g. €600,000 per lot (10,000 tons) in 2003) to a special account at the State Treasury. Successful bidders settled the difference. Purchased lots could not be traded. None of the applicants could buy more than 50 per cent of the import volume, and 20 per cent of the tariff rate quota was reserved for new entrants.

Also, raw sugar can get to Ukraine on tolling contracts, with further mandatory re-export of refined cane sugar. For example, in the 2003/04 marketing year Ukraine imported 646 thousand tons of raw sugar using the tolling scheme (Zorya and Nivjevskiy, 2005). Only 299 thousand tons were re-exported, leaving 347 thousand tons in the country. This is achieved by re-exporting "empty" wagons of refined sugar or by artificially lowering the extracting coefficient from raw sugar (which is normally 95%). Finally, high domestic prices in Ukraine and high out-of-quota tariffs encourage sugar smuggling. The amount of illegal imports fluctuates in a range of 200—400 thousand tons of cane sugar per year.

As Table 9.8 shows Ukraine had prohibitive import tariffs on sugar beet until 2005, which effectively restricted trade. However, in the beginning of 2005 in the course of WTO membership preparations Ukraine reduced most of its agricultural tariffs, including sugar beet. So, with the beginning of the 2005/2006 campaign the first ever imports of sugar beets arrived for processing. According to the official statistics about 113 thd tons of sugar beets were imported from September 2005 to January 2006. Imports came from Belarus (71 thd tons), Poland (21 thd tons) and Lithuania (20 thd tons). Since the Government of Ukraine is determined to increase the minimum price to UAH195/t (EUR32/t), but EU gradually cuts its sugar beet price to EUR25/t it is very likely that sugar beet imports will take place further.

The situation with sugar import tariffs is different. The Ukrainian Government was not yet able cutting its prohibitively high tariff rate (see Table 9.8). As a result, the legal import mostly takes place when there is a tariff rate quota or when world prices are high enough, e.g. as it was last summer. The major exporters of sugar to Ukraine (including raw cane sugar) were Brazil, Cuba, United States, Germany, UK, Poland, and Belarus. The small amount of export of Ukrainian sugar has been limited to CIS countries.

Competitiveness of sugar production in Ukraine before and after WTO membership

Despite relatively favorable current market conditions for the sugar industry, it seems that future WTO membership of Ukraine would be a real challenge for the current sugar market organization in Ukraine. It seems that the protection of the sugar industry does not lead to serious restructuring and improved competitiveness. According to the preliminary results of the WTO negotiation process, Ukraine is going to provide a tariff-rate quota for raw sugar at 260 thousand tons (although some countries have been insisting on 400 thousand tons) to be imported at 2% import duty. Out-of-quota tariff would decrease to 50%. Moreover, Ukraine together with other WTO members can already now anticipate further restrictions on its sugar market organization in the case of a successful comple-

tion of the Doha round negotiations. Most likely the Swiss formula¹⁷⁶ of tariff reduction will be adopted, meaning a further sharp cut in sugar import duty.

Table 9.10

Comparative summaries of Doha Round offers on agriculture (market access) by EU, US and G-20

Market access	EU	US	G-20
Tariff reduct	Tariff level: 0-30% = 20% cut 30-60% = 30% cut 60-90% = 40% cut 90% + = 50% cut	Tariff level: 0-20% = cut of 55% to 65% 20-40% = cut of 65% to 75% 40-60% = cut of 75% to 85% 60% + = cut of 85% to 90%	Tariff level: 0-20% = 45% 20-50% = 55% cut 50-75% = 65% cut 75% + = 75% cut
Tariff cap	100%	75%	100%
Sensitive products	Max. 8% of tariff lines	Max. 1% of tariff lines	-

Source: Agra Europe (2005c)

According to these proposals Ukraine may face further sugar import tariff cuts from 30% to 85%, meaning effective import tariff at 38—27% after completion of the Doha round and WTO membership. Ukraine would most likely negotiate sugar as a “sensitive” product to avoid maximum tariff cuts, but new tariff quotas would have to be opened to compensate exporters and guarantee market access (Agra Europe, 2005c). This means that in a case of treating sugar as “sensitive product” Ukraine would be required to increase its sugar tariff rate quota (probably to 400 KMT).

Furthermore, domestic support will be subject to reductions, meaning the “amber” box constraints for Ukraine. All these future constraints imply that it is hard to imagine that the sugar market organization in Ukraine will not further change.

Figures 9.14 and 9.15 provide graphical presentations whether Ukraine’s sugar industry is competitiveness under different world vs. domestic sugar price ratios. For detailed information on how these diagrams were built please refer to the Annex B. Consider first Figure 9.14 with current effective sugar import tariff at EUR300/t. If we take the last summer world vs. domestic sugar price ratio (e.g. point July 15, 2005), when domestic prices surged by 75%¹⁷⁷ Ukraine’s sugar industry becomes on average uncompetitive since imports become profitable. Of course the most efficient producers might survive in such a situation. A similar situation happened in the beginning of this year, when domestic prices surged again (see the point March 03, 2006), but accompanied by significant world market price increases. In this case we find domestic sugar industry competitive. However, assuming that WTO accession most likely would leave Ukraine with 50% import tariff only, this will put more pressure on its sugar industry. Figure 16 basically illustrates the same result as Figure 15 under the reduced import

¹⁷⁶ Swiss Formula means higher tariffs are cut more than lower tariffs.

¹⁷⁷ Year over year calculation.

tariff and the same price ratios. However, one very important conclusion could be drawn: Ukraine's sugar industry protection is very vulnerable to low world market sugar prices. Currently world market conditions with high prices are relatively favorable for the industry, however it will not last forever. Sooner or later world sugar prices will return to their equilibrium, implying a real challenge for Ukraine's sugar industry, provided no significant restructuring taking place by that time.

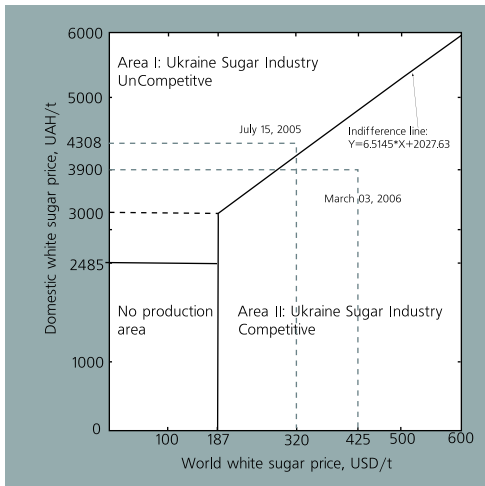


Figure 9.14
 Sugar market regime before WTO membership
 Source: Own presentation.

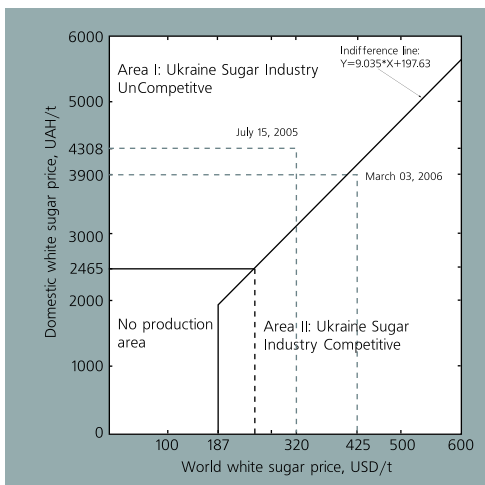


Figure 9.15
 Sugar market regime after WTO membership
 Source: Own presentation.

Further considerations: economic costs, employment, inflation, and poverty

Consumers' transfer to sugar producers

World market price has always been the opportunity cost for consumers of a commodity in any country. In other words, this is the cost of a commodity that consumers would pay provided no production of that commodity takes place in a country. The same applies to sugar. The economic costs of border protection can be measured comparing domestic prices with import parity prices. However, there is no such term as "one world market price" in the sugar world (von Cramon-Taubadel, 1999). There are many of them depending on different factors such as quality and refinement of sugar, marketing terms, etc. The most frequently used price as an indicator of the world sugar price is so called ISA (International Sugar Organization) price, being the average of several raw-sugar prices. Raw sugar is traded more intensively than white sugar, because white sugar is very sensitive to long distance transportation. The ISA price is lower than the white sugar price on the London Exchange (LIFFE) that is shown in Figure 9.16.

As Figure 9.16 shows that domestic sugar prices are much higher than indicative world sugar market prices, demonstrating that consumers support domestic sugar producers in Ukraine. In order to quantify this support we calculated the import parity price of white sugar on a domestic market and compared it to the domestic white sugar price. Table 9.11 provides a detailed description of these calculations. The choice of white sugar price at European ports as a relevant world or border price reflects the real situation with white sugar import options for Ukraine. Moreover OECD uses these border prices in its Producer Support Equivalent (PSE) calculations not only for Ukraine, but for many other Black Sea basin countries. Since Ukrainian white sugar is of relatively lower quality, it could be sold only at discount. We accounted for this fact as well.

Table 9.11
The estimation of consumers' transfer to the Ukrainian sugar industry

	2004	2005
Domestic Consumption, m t	2.15	2.19
Domestic Price (minimum price), UAH/t	2370.00	2998.41
Import parity (reference) price, UAH/t:	1744.53	1818.82
Border reference price*, USD/t	239.54	261.00
Official exchange rate, UAH/USD	5.30	5.05
Handling and processing costs, UAH/t	184.21	197.63
Import VAT, %	20.00	20.00
Market price differential, UAH/t	625.47	1179.59
Consumers' transfer to sugar producers, m UAH	1341.64	2583.30

Source: Own calculations; Notes: *-White sugar, Paris, European ports in bags of 50 kg.

The volume of the transfer is considerably high in a country with a high share of food products in the consumer basket (64 %). Table 9.11 shows that consumers transferred to sugar producers more than UAH 1.3 and 2.5 bn per year in 2004 and 2005 respectively by paying the price for the protection of the domestic sugar industry.

Sugar price and poverty

As Table 9.12 demonstrates each citizen of Ukraine transferred UAH28.36 and UAH55.02 to sugar producers in 2004 and 2005 respectively. Although the daily transfer is not that high, i.e. 8 and 15 kopecks respectively it should be considered that Ukraine is a country with a relatively high share of poor people. According to IER poverty study¹⁷⁸ 11.79% of the whole Ukrainian population is considered as "poor" if we apply the "one dollar per day" absolute poverty line. However, the same study estimated the Income Gap Ratio (IGR) at 21.13%, showing the depth of the poverty. In other words, the IGR at the poverty line "one dollar per day" indicates that on average poor households in this group were 21.13% below the poverty threshold, or lived for UAH4.18 per day (0.83 cents per day) in 2004. We assumed the same order of magnitude in 2005, implying the same figures. So dividing the average income of poor group population (according to the poverty line chosen) by consumers' transfers per capita per day we received a "sugar tax" that poor consumers pay to allow Ukrainian sugar industry operating. In 2004 and 2005 this "tax" was 1.86% and about 3.6% respectively. Although cutting domestic sugar prices to the level of world market prices would not solve the poverty problem in Ukraine, however, the estimated implicit taxation seems significant, especially for the poorest population.

Table 9.12
Consequences of high sugar prices for poverty in Ukraine

	2004	2005
Consumers' transfer to producers, m UAH	1341.64	2583.30
Population of Ukraine, m	47.30	46.95
Transfers per capita, UAH	28.36	55.02
Transfers per capita per day, UAH	0.08	0.15
Poverty Line "one dollar per day":		
People affected, % of population	11.79	
Income gap ratio, %	21.13	
or = UAH/day	4.18	4.18
"Sugar Tax"	1.86%	3.61%

Source: Own presentation.

¹⁷⁸ Handrich and Betliy (2006).

Sugar price and inflation

The inflation rate as measured by the consumer price index (CPI) is a very important macro economic indicator for Ukraine. The relatively high rate of inflation that Ukraine experiences so far should not be mainly explained by monetary factors or by monetary policy alone (Giucci and Bilan, 2005). High protection from foreign competition seems serving one of the main reasons behind the inflation problem, and sugar has been one of the potential triggers of inflation.

As explained above the Ukrainian sugar market has been successfully protected from foreign competition, which drives a wedge between domestic and world prices. However, according to the sugar balance the domestic production has not been sufficient to meet the domestic demand. Also, the sugar demand is relatively inelastic (due to its low substitutability), making sugar prices very sensitive to temporarily market imbalances. Therefore, under the current sugar trade regime in Ukraine there is a high risk of sugar price jumps.

Table 9.13 shows the share of sugar in the consumer basket in Ukraine. 64% consists of food with sugar at 2.6%. If we assume the sugar contained in confectionary goods at about 30%, then sugar takes up additional 0.96% ($3.2\% \cdot 0.3$) of the consumer basket.

Table 9.13
Consumers basket composition in Ukraine

	Share of goods, %	Share of group, %
Food goods	64.0	64.0
Sugar containing food goods:		8.0
sugar	2.6	
confectionary	3.2	
jams, honey	0.4	
Other food goods		56.0
Nonfood goods	15.5	15.5
Services	20.5	20.5

Source: Ministry of Economy

Sugar accounts for approximately 3.56% of the consumer basket. This implies for example that a 75% increase in sugar prices (as in last summer) contributed with 2.7% to inflation effectively reducing the real income of the population, raising macroeconomic stability and food security concerns.

Employment and social aspects

Table 9.14

Employment in the sugar factories of the EU and Ukraine

Country	2003/2004			2004/2005		
	Permanent	Campaign	N of factories	Permanent	Campaign	N of factories
Germany	-	6778	27	-	6721	26
France	6664	9347	34	6112	8606	30
Poland	11079	21948	56	8807	15578	43
Ukraine	Na	Na	Na	Na	35000-70000	160

Source: Zuckerwirtschaft (2006); Notes: Na — not available.

Restructuring the sugar industry in Ukraine will inevitably lead to a significant reduction of employment in the industry (see the experience of EU countries in Table 9.14), raising important social concerns in the sector as well as for policy makers. The analysis of this issue requires additional extensive studies. However, the degree of the problem might be sketched at this stage.

We believe that three main points are important in this regard:

1. The social sphere should be separated from the sugar industry. Any business entity cannot effectively serve the social infrastructure and be efficient and competitive at the same time in business, since it implies additional costs and leads to conflicts of interests (maximizing profits versus maximizing access to communities' utilities). This is especially relevant for the sugar industry, often the only employer in a particular location (many district towns in Ukraine grew around sugar factories).
2. Sugar beet growers should be of the least concern in this context. Of course sugar beet is an important element in the crop rotation for the farmer, however there are other often more lucrative and less capital intensive crops than sugar beet that farmers might opt for production. So one should not expect significant employment and social problems with sugar beet growers in the course of sugar industry restructuring.
3. The sugar industry workforce should be of the primary concern for policy makers. In 2005 campaign labour costs ranged from 0.08 to 0.16 man/day per each ton of processed sugar beet. Including all existing factories (160) we receive daily processing capacity of about 0.43 m tons of sugar beet. So the total estimated workforce employed in the sugar industry would range from 35 thd to 70 thd workers. If the Ukrainian sugar industry would be restructured efficiently it will end up with a workforce comparable to that of France or Germany, i.e. 7—8 thd people. About est. 28—63 thd people would lose their job. The Government

should facilitate their efforts in finding new jobs (re-training programs, lay off payments). Assuming the average monthly wage at USD200 (about the level reported by the official statistics), about USD67-151.2 m would be required to pay the annual salary to those losing their jobs from the State Budget (or better from the restructuring fund proposed in the recommendations).

World market trends

From a global point of view the competitiveness of sugar production is mainly influenced by natural conditions (climate, soil), production efficiency in the value chain, quality of farm management and management of sugar processing and marketing as well as the availability of competitively produced raw materials. Looking at the raw material supply only it is commonly accepted by experts and the sugar industry that sugar production based on sugar cane is more competitive than sugar production based on sugar beet for various reasons. This is reflected by global production trends (revealed comparative advantages). Even with highly protected sugar beet markets world production trends clearly show the competitiveness of cane sugar. Without protection of sugar beet production it would cease to exist in the long term in Europe, including Ukraine.

Table 9.15
Global production of cane and beet sugar

Year	Beet sugar (t)	%	Cane sugar (t)	%	Total
1900/01	5,963,200	53.0	5,296,800	47.0	11,260,000
1960/61	24,306,000	39.7	36,848,000	60.3	61,154,000
1980/81	32,788,00	33.1	66,147,000	66.9	98,935,000
1995/96	36,566,000	26.9	99,540,000	73.1	136,106,000
2004/05	35,876,000	23.2	119,223,000	76.8	155,099,000

Source: Zuckerwirtschaft (2006).

This production trend reveals the fundamental advantage of sugar cane and the fundamental disadvantage of sugar beet. Even with highly efficient sugar beet production and modernized sugar factories in Europe this fact should not be overlooked in all policy considerations. From an economic perspective Ukraine would buy sugar on the world markets and phase-out sugar production based on sugar beet as raw material. Ukraine as a whole would benefit and become richer.

The sugar world market prices have been highly volatile in the past. This is reflected in the following graphical presentations.

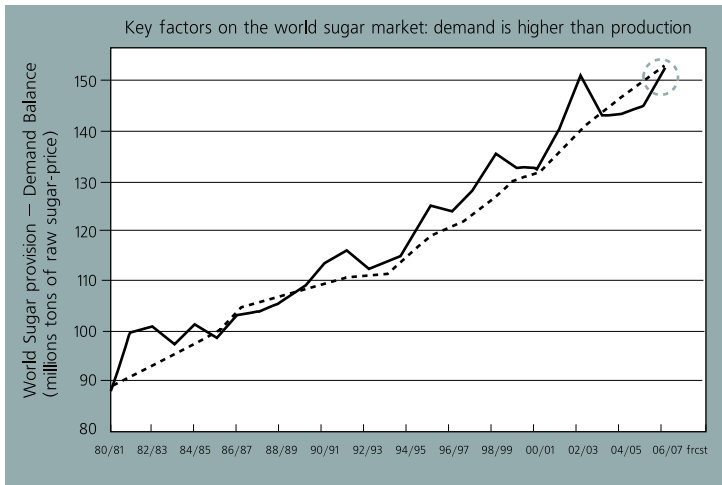
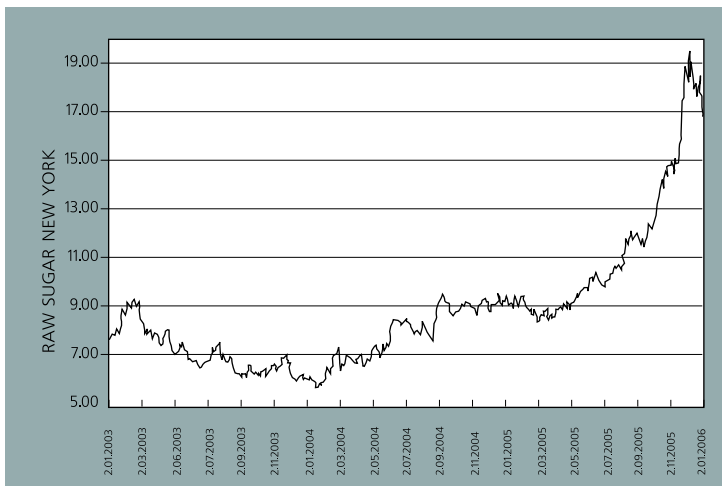


Figure 9.16
Sugar world market prices, demand and supply



Source: Kirchberg, Suedzucker. 2006.

Currently, prices are relatively high due to the following factors influencing the world sugar balance:

- ✓ 2005/2006 world production: 145 mln t (+1.5 % compared to 2004/5);
- ✓ 2005/2006 world consumption: 149 mln t (+2 % compared to 2004/05);

- ✓ sugar stocks are decreasing because of third deficit year;
- ✓ decrease of exports from Brazil due to higher domestic ethanol production.

The world deficit of about 4 mln t leads to rising prices. If trends persist a new balance would be reached in 2006/7 probably leading to price decreases. However, there are also strong factors leading to increased global consumption. The main demand comes a) from Asia, and b) from increasing ethanol production in Brazil, the most important global sugar producing and exporting country. It is therefore difficult to predict future sugar prices. It is likely that in future floor prices for sugar may be determined by fuel prices. On the production side, the EU sugar market reform will lead to reduced sugar production in the EU (minus 5 mln t are expected; see next chapter for detailed explanations).

What are the most likely trends?

- ✓ Sugar world markets have been and will most likely continue to be volatile;
- ✓ there are strong indications that future sugar world market prices fluctuate at a higher level than in the past;
- ✓ demand from Asia and ethanol production are the most important demand factors;
- ✓ EU sugar market reform will reduce sugar exports from Europe and will increase import opportunities to Europe.

Reform of the sugar market in the EU

On 24th November 2005 the EU Council decided on the reform of the EU sugar market regime. The EU sugar market regime sets stable framework conditions for sugar and sugar beet producers since 1968 at a comparatively high price level compared to world markets. Although consumers of sugar and scientists frequently complained that consumers had to pay the price of the EU sugar market regime, the political influence of sugar and sugar beet producers was always high in Europe and ensured a stable policy framework for almost 40 years. This had a positive impact on investments, e.g. in Eastern Germany after German unification.

The reasons for the recent reform are due to international developments in trade and development negotiations. In the course of 2004 the conflict resolution panel of WTO decided that the EU export subsidies for sugar do not comply with WTO rules. It followed the reasoning and complaint of Brazil, Thailand and Australia with the following justification: The annual export of about 3 mln. t of not directly subsidized sugar (so-called C sugar) is dumping because the subsidized prices for sugar quota (so-called A sugar) are set at such a high level that these prices do not only cover the costs of A sugar but also the costs of C sugar. This cross sub-

sidization goes against WTO rules. WTO considers these cross-subsidies as export subsidies. Principally, export subsidies are not allowed (Agra Europe (2005a and 2005b), Strubenhoff and Lissitsa, 2006).

Re-export of about 1.6 mln t of sugar from former EU colonies (so-called ACP countries)¹⁷⁹ will also be banned from 22nd May 2006 onwards because these exports are considered as subsidies of exports not allowed under WTO rules.

Additionally, the EU signed the agreement "Everything but Arms" with 50 least developed countries. This agreement will allow participating countries to sell sugar to the EU without paying import duties from 2009 onwards.

The EU had to react on these international developments aiming to reduce production by about 5 mln t of sugar to avoid further exports and to make the sugar sector more competitive in view of future sugar imports to the EU. These aims were at the end also acknowledged by the European sugar industry, in particular in countries with competitive sugar and sugar beet production, e.g. France and Germany. The EU will thus in future limit its sugar production and distribution to the domestic market.

What has been decided?:

- ✓ reduction of the sugar price by 36% and reduction of the sugar beet price by 39.7% until 2009 (2006: — 20%; 2007: — 27.5%; 2008: — 35%; 2009: — 36%);
- ✓ sugar beet farmers receive direct decoupled payments equivalent to 64.2 % of the price reduction based on the final price cuts;
- ✓ the quota system will be simplified by merging A and B quotas because of future marginal exports;
- ✓ introduction of a private sugar stock holding system and replacement of intervention prices by reference prices (the intervention mechanism will be abolished after a 4 year phase-out period);
- ✓ restructuring support for sugar producers deciding to end sugar production (handing over production quota rights to the restructuring fund) with payments for the year of ending production (2006 and 2007: 730,— E/t; 2008: 625,— E/t; 2009: 520,— E/t; once only!);
- ✓ the restructuring fund is financed by a levy on holders of quota, i.e. the sugar industry and keeps the consumer prices at the current level for the transition period;
- ✓ sugar beet farmers get at least 10 % of the restructuring support to sugar producers;

¹⁷⁹ More than 40 countries from Asia, the Caribbeans and the Pacifics (ACP) mainly former colonies of EU member states with privileged access to EU markets.

- ✓ the volume of the restructuring fund is estimated at about 5 bln. Euro;
- ✓ sugar producers may buy sugar quota at a total volume of 1.1 mln t (maximum) from the restructuring fund at a price of 730 E/t;
- ✓ additional support for affected regions will be available to diversify production (109 E/t sugar);
- ✓ if the restructuring fund would not get sufficient quota from the sugar industry to reduce production by the volume of current exports the EU will decide to introduce general quota cuts from the year 2010 onwards;
- ✓ increase of isoglucose quota in three steps;
- ✓ sugar beet production will benefit from EU measures for the development of renewable energy (sugar for bioethanol, pharmaceutical and chemical purposes does not fall under the quota system);
- ✓ the new EU sugar market regime will be valid until 2015.

Table 9.16

New sugar and sugar beet prices in the EU

	before reform	July 06/ Sept. 07	Oct. 07/ Sept. 08	Oct. 08/ Sept. 09	Oct. 09/ Sept. 10	Oct. 10/ Sept. 15
Intervention /reference price (E/t sugar)	631.9	631.9	631.9	541.5	404.4	404.4
Restructuring fund (E/t sugar)	-	126.4	173.8	113.3	0	0
Net sugar price (E/t sugar)	631.9	505.5	458.1	428.2	404.4	404.4
Production levy (E/t sugar)	-	12	12	12	12	12
Sugar beet price (E/t sugar beet)	43.6	32.9	29.8	27.8	26.3	26.3

NB: Production levy equally shared by sugar and sugar beet producers.
Source: European Commission and Suedzucker, 2006.

Table 9.17

Restructuring fund payments

	July 06/Sept. 07	Oct. 07/Sept. 08	Oct. 08/Sept. 09	Oct. 09/Sept. 10	Oct. 10/Sept. 15
Decoupled payments (E/t sugar)	730	730	625	520	0
For sugar industry (E/t sugar)	max. 657	max. 657	max. 562.5	max. 468	0
For sugar beet growers (E/t sugar)	min. 73	min. 73	min. 62.5	min. 52	0

NB: Payments per ton of sold sugar.
Source: European Commission and Suedzucker, 2006.

What is the expected impact?

According to the expectations of the European Commission and the Governments of the Member States it is expected that the restructuring fund will receive about

5 to 6 mln t of sugar quota out of a total of 17.4 t. This amount would be sufficient to avoid future sugar exports and to allow for increased sugar imports. The restructuring fund is conceived in a way that the sugar consumer prices will remain at the current level for a transition period of 4 years. This will strengthen the most competitive sugar producers in the EU and it is expected that in particular regions in South and North Europe reduce production.

The European Commission and the sugar industry expect that Greece, Ireland, Italy, Portugal, Finland, Latvia, Slovenia will give up sugar production (source: European Commission, assessment report 2004 and various personal communications, 2006). Czech and Slovak Republic, Denmark, Hungary, Spain are expected to considerably reduce production. Austria, Belgium, France, Germany, The Netherlands, Poland, Sweden, Great Britain are expected to marginally reduce production. The remaining sugar and sugar producers are forced to continuously further increase competitiveness by reducing costs and increasing productivity. Production will go to the most competitive regions and the most competitive producers.

To ensure further stable policy framework conditions in a capital intensive industry, the European Commission intends to further keep the external protection level at the border at the level of the sugar prices in the EU. This implies that the EU has to ensure that the future price level of about 400,— Euro will be guaranteed by import duties and — if necessary — by WTO safeguard clauses.

Also, the European Commission intends to introduce adequate measures to reduce sugar imports if the sugar imports from least developed countries would grow by more than 25 % per year.

In future, further pressure on prices is likely. The Doha Round will be completed and another round of international trade negotiations will begin. Even with new energy market opportunities in sight this will not fundamentally change the economic disadvantage of European sugar production.

Restructuring of the sugar sector in Eastern Germany — Lessons for Ukraine

Following the privatization of the sugar industry of the former GDR in 1991 the Eastern German sugar industry has been restructured by support of 4 West German and 1 Danish sugar holding. The restructuring strategy has been worked out jointly by the Government, the German privatization agency and the involved sugar holdings.

As Eastern Germany became after German unification immediately member of the EU without membership negotiations, the EU sugar market regime was ap-

plied with prices of about 630 Euro/t sugar and about 33 Euro/t sugar beet. The sugar quota was fixed at 847.000 t sugar and distributed mainly to the most promising regions. It is important to note that the sugar quota was made tradeable to allow necessary future structural change.

The restructuring strategy had the following elements:

- ✓ regional focus on most promising and competitive regions;
- ✓ immediate closing of 15 sugar factories with further intentions to decrease the number of sugar factories;
- ✓ each sugar holding concentrated on specific regions with limited overlapping;
- ✓ investments in new sugar factories (green field investments; 10.000 — 18.000 t/d);
- ✓ prolongation of sugar campaign to 90 days;
- ✓ specific investments in the sugar factory to improve technical efficiency;
- ✓ specific investments in sugar beet production (advisory services and input supply);
- ✓ introduction of modern management, marketing and costing concepts.

The volume of investment has been estimated at about 1.3 bln. Euro. 170 mln. Euro have been provided by the German Government as a grant.

This led to the following development during the last 15 years:

Table 9.18
Restructuring of the sugar industry in Germany

	GDR 1998	East Germany 2004/5	Units
Sugar factories	43	6	
Average capacity	1.604	10.900	t/d
Workers	14.534	1.300	
Sugar beet yield	31.3	51.8	t/ha
Sugar yield	4.3	8.6	t/ha
Energy use	4.100	1.020	kWh/t sugar
Labour productivity	43	844	t sugar/worker
No. of sugar holdings		4	

Source: Suedzucker, Nordzucker, 2006.

The restructuring of the sugar sector involved also important changes in sugar beet production. The major changes were:

- ✓ Increase of number of sugar beet growers caused by the farm restructuring process.
- ✓ Reorganized transport of sugar beets from farms to factories by the factories themselves (25 t truck transport capacity, no rail transport, no farm transport).
- ✓ Improved logistics (sugar beet storage, cleaning and handling).
- ✓ Improved farm practices (cultivation, seeding, improved seeds, optimal use of fertilizers, pesticides).
- ✓ Investments in farm machinery (cultivation, seeding, spraying, harvest).

These measures with considerable investments from the sugar industry in farm advisory services led to steadily increasing sugar beet yields.

A further important aspect concerned measures in sugar distribution and marketing. Here, the following steps were made:

- ✓ Sugar quality improvement according to EU standards.
- ✓ Introduction of western trade marks.
- ✓ Improvement of packaging.
- ✓ Broadening of product range.
- ✓ Improvement of logistics and packaging for key accounts.

As a result, through huge investments and know how transfer, focusing on a) investments in the sugar factory including green field investments, b) investments in raw material supply and sugar beet production, and c) investments in distribution and marketing increased efficiency and profitability of the East German sugar industry to a level that it is highly likely that it will survive the latest EU sugar market reform.

What are the specific Eastern German lessons learnt for Ukraine?

It is evident that the amount of money injected by the EU and the German Government into the East German sugar sector 15 years ago was based on exceptional historical circumstances based on political considerations rather than on economic reasoning. The Government of Ukraine will certainly not be able to mobilize funds in this order of magnitude for green-field investments.

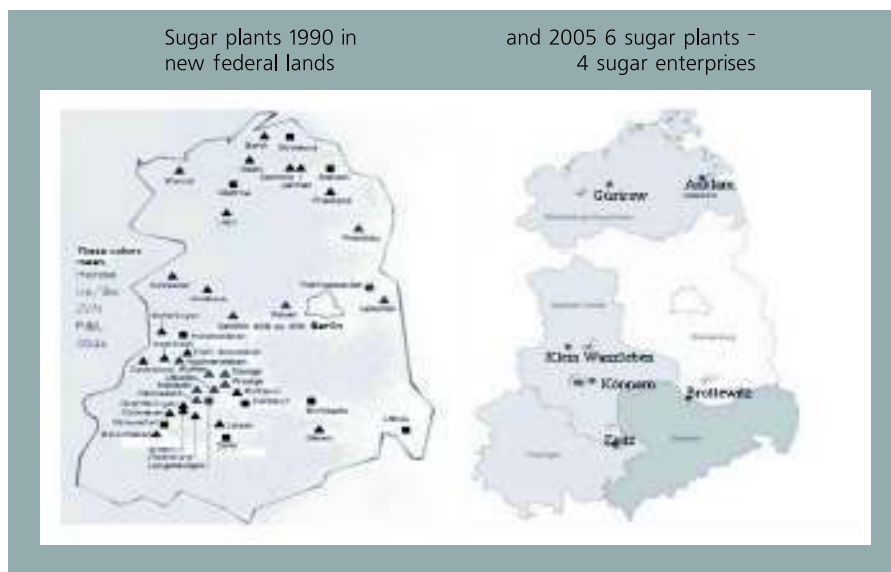


Figure 9.17
 Location and number of sugar processing plants in Eastern Germany
 Source: Kirchberg, Suedzucker, 2006.

Restructuring of the sugar sector in Poland — Lessons for Ukraine

After privatization of the sugar industry during the years 1989 to 1994 there have been a few years of stagnation in the Polish sugar sector before the restructuring process actually started. The process was supported by a clear Government strategy designed in 2000/2001. The strategy development was partly influenced by EU membership perspectives. Part of the strategy was the invitation of foreign investors to contribute to the restructuring process. After implementation of the strategy the Polish sugar sector changed drastically during the last years.

The most important elements of the restructuring strategy were:

- ✓ increase of production and reduction of the number of sugar factories;
- ✓ investments in capacity (no green-field, brown-field only), storage, energy efficiency and quality;
- ✓ increase of labour productivity and investments in human resource development;

- ✓ increase of sugar beet yields;
- ✓ stable legal and policy framework.

Table 9.19
The sugar sector in Poland

		1989	2001	2002	2003	2004	52005
Sugar factories	No.	78	71	65	57	43	40
Sugar companies	No.		Na	Na	Na	Na	5
Campaign days	days		49	67	64	77	79
Sugar beet yield	t/ha	33.2	Na	Na	Na	Na	42.8
Sugar yield	t/ha	Na	6.04	4.86	6.66	6.8	6.55

Source: Koziolok, Nordzucker Polska, 2006; Na — not available.

The restructuring process is ongoing but it is highly likely that the Polish sugar sector will survive even after EU sugar market reform.

What are the specific Polish lessons learnt for Ukraine?

In the Polish case the EU membership perspective with access to the sugar market regime support mechanisms has been the key for mobilizing funds from the public and private sector, including foreign direct investment, for restructuring the industry. EU membership is not a realistic option for the next 10 years. Also, negotiations about a possible EU-Ukraine Deep Free Trade Agreement will most likely exclude access to the EU sugar market regime.

Restructuring of the sugar sector in Moldova — Lessons for Ukraine

The sugar sector in Moldova went through a painful restructuring process during the last years. Some of the lessons learnt may be of specific importance for Ukrainian policy makers.

After WTO accession of the Republic of Moldova in 1997 the import tariff was reduced to 15 % leading to increased imports of raw sugar. Additionally, “grey import schemes”, illegal trade and erratic tax free imports of raw sugar destabilized the Moldovan sugar market.

This was a constant concern of the Moldovan Government and the sugar industry so that the external protection was increased in two steps from 15 % to 35 % and further to 45 % using WTO safeguard clauses for the second step in 2004. Furthermore, the Moldovan Government increased its efforts to combat illegal

trade and smuggling and set incentives to reduce barter trade between sugar factories and sugar beet growers.

Table 9.20

Sugar beet yields and production structures of farms producing for Suedzucker Moldova

		2001	2002	2003	2004	2005
Yield	t/ha	21.7	28.3	20.5	31.2	36.2
Farms above 5 ha sugar beets	No.	605	366	282	293	229
Farms >30t/ha sugar beet yield	%	5	16	10	38	58
Share of farms >30t/ha at total area	%	11	29	19	51	66
Highest yield	t/ha	48	55	66	72	65
Share of farms >30t/ha at total supply	%	19	38	32	65	7

Source: Mueller, Suedzucker Moldova, 2006.

The sugar industry — including foreign investors — supported this process by the development of stable long-term relationships with sugar beet growers. Investments were made in the remaining sugar plants but also in raw material supply. Western concepts of sugar distribution and marketing have been introduced to stabilize the sugar market.

In particular the investments in the whole vertical value chain from the sugar beet grower to the sugar processing plant to the sugar market have been important to slowly increase efficiency of the sugar sector in Moldova. This is reflected by the German investor Suedzucker supporting sugar beet growers with farm advisory services, pre-financing of necessary inputs (seed, fertilizers, and pesticides), agricultural machinery services and payment of sugar beets according to quality.

It should be noted that even with heavy investments the time needed for efficiency gains is considerably long. Sugar beet growing is a complex enterprise. Technical as well as farm management issues should not be underestimated. In this view the long-term commitment of the investors — including foreign ones — is important to increase efficiency in the whole value chain.

The restructuring process of the sugar sector is still ongoing but perspectives have been slightly improving through consolidated actions of the Moldovan Government in close collaboration with the Moldovan sugar industry, Moldovan sugar beet growers and foreign investors.

Whether this policy is sustainable will mainly depend on future efficiency gains in the sector and world market developments.

Table 9.21
Sugar production in Moldova

		1999	2000	2001	2002	2003	2004	2005
Sugar yield	t/ha	1.7	2.2	2.2	2.8	2.7	3.7	6.7
Energy consumption	KWh/t sugar	6069	5161	4632	4831	4464	3542	2861
Sugar production	1000t	94.4	102.4	116.3	113.8	83	110.8	133.5
Domestic sugar price	US\$/t		309	329	290	353	405	531
Sugar producers	No.		Na	Na	Na	Na	Na	2
Sugar plants	No.		Na	Na	Na	Na	Na	5

Source: Suedzucker Moldova, 2006.

What are the lessons learnt from these three country cases?

1. Restructuring of the sugar sector needs a clear Government strategy with important basic decisions on import regime, internal market regime, long-term support mechanisms and stability to minimize external shocks.
2. Government, sugar industry and sugar beet growers have to work in close collaboration to improve the whole vertical value chain from sugar beet production to sugar processing, sugar distribution and marketing.
3. If the volume of production is limited by the domestic market or international trade obligations the number of sugar factories has to be reduced drastically and the efficiency of the remaining sugar factories has to be increased rapidly.
4. The Government has to ensure that production goes to the best locations and best producers to make the sector efficient.
5. Foreign direct investment may play an important role to increase efficiency by investments, know how transfer and market transparency.

Conclusions

Policy options: Phasing-Out or Stability Pact?

To stimulate structural change after years of stagnation of the Ukrainian sugar sector, policy makers in Ukraine in principle **have two choices, a) to abolish import tariffs as well as production quota and minimum prices and allow free sugar trade and production, or b) to protect domestic production according to WTO negotiations and to produce sugar for domestic consumption only. According to WTO restrictions the second option rules out sugar exports** since extensive export of beet sugar is not possible without export subsidies and

Ukraine offered no recourse to export subsidies in its WTO accession negotiations.

Following the first option would most likely lead to quickly shrinking production of sugar in Ukraine due to limited competitiveness of beet sugar on world markets. It would however have the advantage of lower sugar prices for consumers. During phases of low world market prices the sugar industry in Ukraine would die, a few islands of production may survive subject to world market price fluctuations and efficiency of the remaining production. From an economic point of view this option would bring the highest return to the Ukrainian economy. However, if this economic "first best" scenario would not find a political majority in Ukraine an alternative scenario will have to be developed. A second scenario would involve a strategy development process where the Government, in close cooperation with the sugar industry, sugar beet farmers and other relevant stakeholders would work out a domestic sugar sector strategy following principles of competitiveness, transparency, efficiency and selected investment.

Both strategies would not involve green-field investments in new sugar factories but would make the best use of the quasi-fixed capital stock in the industry until its complete use and amortization.

The second strategy would have the objective to produce sugar for the domestic market only and would provide stability to increase the efficiency of the sector. All stakeholders would have to agree on such a "stability pact".

The following issues would be crucial for implementation:

a) external protection set by the WTO negotiation process

Ukraine negotiated a Tariff Rate Quota at 260,000 tons of raw sugar imported at 2 % tariff from the year of Ukraine's accession to WTO. Over-tariff quota would be 50 %.

The maximum bound rate for refined sugar will be 50 % of the border price (ad valorem).

The implementation period of the introduction of this import regime has not been defined yet but it is highly likely that the WTO would not accept a period exceeding a limited number of years.

The replacement of the previous import regime (with a prohibitively fixed amount of 300 Euro/t minimum) by the above import tax regime has important implications for the competitiveness of the sugar sector in Ukraine. If prices on world markets are high (as in 2006) this would provide a sufficient protection. However, if prices are low (as in 2005) this regime would not be sufficient to provide effective protection for Ukrainian sugar production at its current low ef-

iciency (discussed in next sections). It may be worthwhile to reconsider this issue during the negotiation process. The Russian variable import regime for sugar may be a model to provide effective protection even with high world market price fluctuations for a transition period even if not compatible with WTO rules in the long run. The following graphical presentation shows the import tariff steps for import of sugar into Russia according to the world market price.

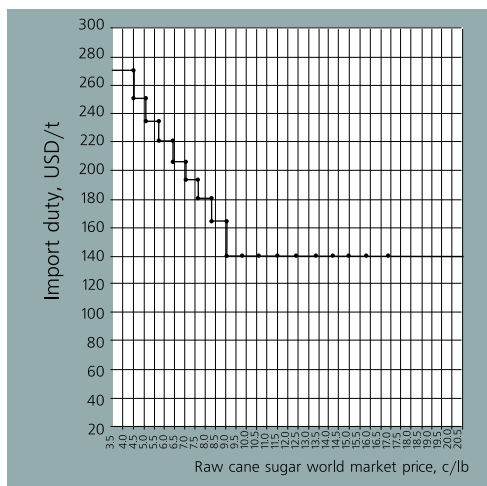


Figure 9.18
The Russian border protection
 Source: Rylko, 2006.

If the Russian model of sugar border protection cannot be re-negotiated with WTO, the expected tariff of 50 % will not be sufficient for all producers to survive. The import regime after WTO accession will increase competition and force the less efficient producers to make production more efficient or to go bankrupt.

b) annual sugar consumption is estimated at about 2.1 to 2.2 mln t

Deducting the above import of raw sugar (260.000t), annual domestic production for domestic consumption could be about 1.8 mln t of sugar. This is almost the current production. At this moment, about 120 sugar factories are producing this annual volume (about 15.000 t/factory on average). In future, 30 to 40 sugar factories (with about 50.000 t/factory) will be sufficient to produce for the domestic market. The Government will have to develop a market based mechanism to support both (i) those factories at sub-optimal locations to phase-out production, and (ii) those factories with good perspectives at good locations to upgrade their production — including sugar beet production — by necessary selective investments, e.g. in processing and energy efficiency.

c) annual distribution of quota has to be replaced by a new transparent long-term mechanism reducing planning risks for investors

The current system of annual allocation of production and import quota by the Ministry of Agriculture Policy increases investment risks and provides no incentives for investments and improvement of efficiency. It provides incentives for corruption.

The first best solution would be to abolish domestic production quotas. This would lead to better allocation of production factors to the best regions and best producers. Efficiency would be most likely increase quickly. However, potential efficiency gains may lead to future over production of sugar beyond domestic consumption. As sugar exports are excluded under the currently negotiated WTO agreement a mechanism has to be introduced to ensure both a) rapid efficiency gains, and b) limitation of future production to domestic consumption.

In case of continued production quotas annual allocation of quota would have to be replaced by a new system of long-term quota allocation. Quota has to be made tradable to ensure that production goes to the most efficient producers and locations. According to EU experiences the first allocation may be based on a sensible reference period based on previous production. After the first allocation the market mechanism will stimulate necessary re-allocation and productivity increases.

With the introduction of tradable quota minimum prices should be abolished to speed up the restructuring process.

d) a restructuring fund should be available to support affected regions, factories, farmers and factory workers

Similar to the implemented restructuring funds of the EU after the sugar market reform, a Ukrainian restructuring fund would have to be established. Funds would be provided to those factories deciding to phase-out production. The remaining sugar industry should finance this fund by a levy on sugar prices if import tariffs will remain at the 50 % level. This is justified because the sugar industry would benefit most of long-term stability. The restructuring fund would provide incentives for rapid structural change so that sugar beet and sugar production goes to the most efficient locations and producers.

The order of magnitude of such a restructuring fund is estimated at USD100—200 m. This figure includes the annual salary compensation for workers losing their job in the sector (USD67—151.2 m,) and USD40 m to support sugar plants deciding to end sugar production (handing over production quota rights to the restructuring fund) with payments for the year of ending production at about USD40/t or UAH200/t. Assuming 30 factories in the sector and further assuming they produce 0.8 m tons of sugar, 1 m tons of sugar quota would likely be transferred to the restructuring fund, implying USD40 m of compensation. Combining compensation for loss of employment and handing over of the sugar quota the

order of magnitude of restructuring fund payments would roughly be estimated at USD140—240 per ton of sugar. The necessary levy on sugar prices would be in the range of USD50 to 100 per ton.

Recommendations and necessary actions

A: If the Government opts for the Phasing-Out Scenario, then the following recommendations are given:

Recommendation A1:

Reduce import tariffs in a first step to the level required by WTO, in a second step to zero. Abolish input tariffs on inputs (e.g. seeds).

Output: Sugar available for consumers at world market prices

Recommendation A2:

Abolish production quotas and minimum prices.

Output: Unbiased production, consumption and trade according to market principles

Recommendation A3:

Support competitiveness of remaining sugar beet producers and the sugar industry by market information and advisory services.

Output: Transparent and efficient production and markets mainly reacting on world market opportunities

Recommendation A4:

Attract Foreign Direct Investment

Output: Competitive and transparent investment climate and innovation

Recommendation A5:

Support closing of sugar factories, factory workers and sugar beet growers by restructuring fund.

Output: Accelerated structural change and social protection

This Phasing-Out Scenario would produce the highest return for the Ukrainian economy as a whole by improved allocation of production factors, rapid structural change and closing of inefficient sugar factories. At the same time it would make surviving producers more competitive, agile and strong.

B: If the Government opts for the Stability Pact Scenario, then the following recommendations are given:

Recommendation B1:

Initiate discussion process with relevant stakeholders (sugar industry, sugar beet growers, Government, consumers associations) to develop “stability pact” for the sugar sector. Make the discussion process transparent and publish results in a Government strategy document. Make the results binding for all stakeholders for a period of at least five years.

Output: Sugar development strategy document

Recommendation B2:

Assess impact of external protection mechanism after WTO accession. Adapt import regime according to the Russian model to ensure sufficient protection if world market prices are low.

Output: Revised import tariff regime for a transition period after WTO accession

Recommendation B3:

Abolish production quotas

Or

Replace annual domestic production quota distribution for sugar and sugar beets by transparent and efficient long-term quota allocation. Make the quota tradeable to increase productivity in the value chain. Abolish minimum prices.

Output: Long-term quota allocation of tradeable quota

Recommendation B4:

Design and implement restructuring fund providing funds for closing of sugar factories. Define priority regions, timing and distribution mechanism. Funds should be provided by the remaining sugar industry to those sugar companies deciding to phase-out production (including sugar beet growers and factory workers) similar to the recently established EU mechanism. The order of magnitude of such a fund is estimated at USD100—200 m.

Output: Restructuring fund financed by the sugar industry

Recommendation B5:

Reduce import tariffs for necessary inputs, e.g. sugar beet seeds, to improve production.

Output: Higher input quality and sugar beet production efficiency.

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10. Sugar — a New Policy for Ukraine?

This chapter was written in December 2007 for F.O. Licht's European Sugar and Sweetener Report. It gives an overview on the sugar sector after Ukrainian independence, recent developments in the sector and an outlook on possible future developments. A specific overview is given on recent developments of sugar holdings and vertical integration of sugar beet production, sugar processing and marketing. Also, calculations have been made for sugar production before and after WTO accession within and without WTO tariff quota. The calculations show that raw sugar imports within the WTO tariff quota are very profitable, while imports above the quota are not profitable assuming current international sugar prices. As sugar exports are also unlikely given current cost structures, the paper concludes that Ukraine is unlikely to regain the position of a sizeable net exporter that it had during Soviet times.

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Market regulations

The sugar law which became effective on 1st January 2000 mimicked the EU sugar regime before its reform in 2006. Production quotas were allotted on a regional and factory basis for domestic consumption (quota A) and exports under government-to-government agreement (Quota B). The main criterion for quota allocation was the contracted beet area rather than actual production. Any production above A and B quotas (C sugar) had to be exported and no B and C sugar could be disposed of on the internal market. In 2006 the system was modified and B and C quotas abolished. The distribution of quotas is now based on past production (the average of the last five years plus additional consideration) but they are not tradable. There are also minimum prices for both sugar beet and beet sugar with annual revisions. Minimum prices are mandatory and if any agent diverts from these prices, substantial fines have to be paid. In contrast to the old EU sugar regime there are no provisions for intervention purchases by the state and no export subsidies. However, the government occasionally buys domestically produced beet sugar through the Agrarian Fund to stabilize domestic prices. In September this year it was decided to buy 250,000 to 300,000 tonnes up to the end of December. The only question is whether there will be sufficient funds to make these purchases. In case of a domestic deficit the government has fixed "temporary" Tariff Rate Import Quotas (TRQs) with low in-tariff rates to fill the gap. In 2003 for example a TRQ of 560,000 tonnes was authorized. In 2004 a TRQ of 125,000 tonnes was established.

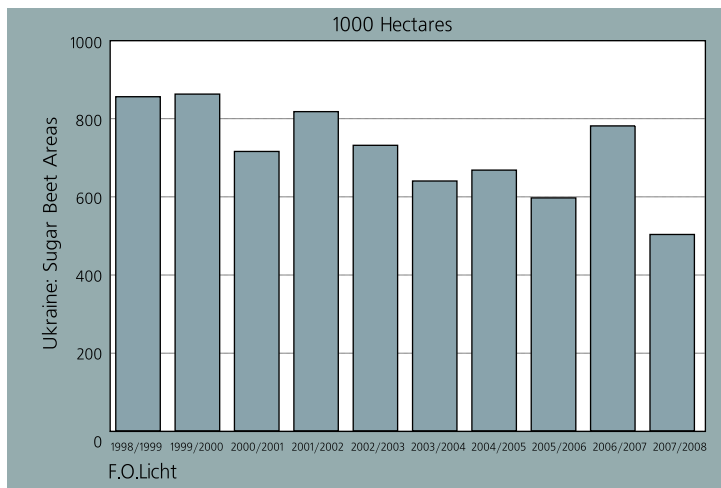


Figure 10.1
Sugar beet areas in Ukraine

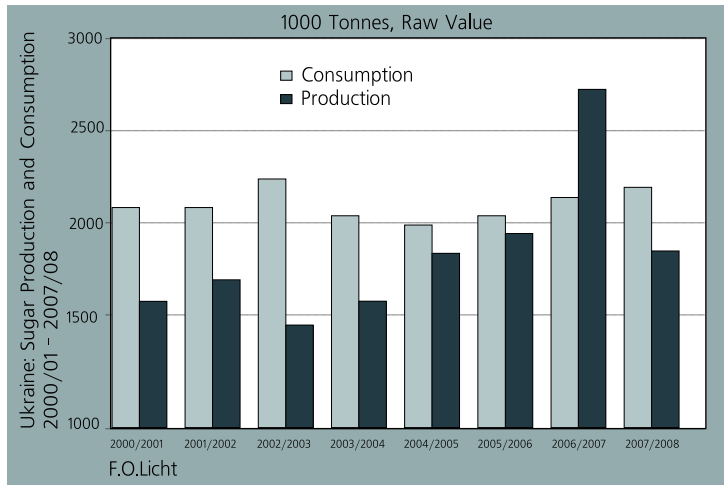


Figure 10.2
Sugar production and consumption in Ukraine, 2000—2008

However, with the sharp rise in production in 2006/07 a TRQ was out of the question and the focus was on import protection, given high domestic and low global prices. Without guaranteed interventions or export subsidies the only government support to the industry is border protection. In order to protect the high domestic price import tariffs are set at 50% of landed cost but no less than EUR300 a tonne. This effectively keeps cheap world market sugar out of the domestic market, although some sugar is imported for tolling purposes with further mandatory re-export of white sugar. The re-export is apparently not strictly enforced as in 2003/04 646,000 tonnes of raw sugar were imported under the tolling scheme but only 299,000 tonnes left the country. Also, high domestic prices and import duties encourage large scale smuggling with illegal imports estimated at 200,000 to 400,000 tonnes annually. Total officially reported imports of both raws and whites reached a little more than 30,000 tonnes in 2006, only a fraction of internal demand.

However, efficient border protection did not solve the surplus problem. Although the industry eyes sugar exports to Kazakhstan and Uzbekistan, exports in general are no way out due to high production costs. Despite mounting stocks sugar exports in 2006 just reached 24,000 tonnes compared with 45,359 tonnes the previous year. According to industry sources average production costs in 2005, before the rise in gas prices in 2006, were \$513 a tonne compared with \$488 in Russia, \$434 in Belarus and \$400 in Moldova. According to Reuters production costs in 2006 were as high as \$614 a tonne. If exports are no solution, the only two other options are, selling the sugar at a loss on the domestic market, and/or

stocking it and reducing production the following year. This is exactly what happened in 2007/08. The area sown to beet was reduced by nearly 36% this year with sugar production forecast to fall to 2 mln tonnes from 2.8 mln the previous year. This would be below internal demand although no large scale imports will be needed, given excessive carryover stocks from the previous year. The difficulties last year, as well as exorbitant production costs, pose the question of what kind of sugar policy should be pursued.

Table 10.1
Ukraine: Sugar imports, January-December (tons)

	2006	2005	2004	2003	2002	2001	2000
Sugar(a)	30555	348920	396698	1478791	473822	449000*	314719
Sugar, raw							
France	-	9586	-	-	-	-	-
Latvia	-	-	-	7600	-	-	-
Lithuania	-	-	6906	-	-	-	-
U.K.	5	10222	-	-	-	-	-
EU	14	19809	6906	7600	9	4	2
Belarus	-	-	-	30099	-	-	-
Russia	-	80	-	9042	-	-	-
South Africa	-	-	-	8984	-	24633	-
Cuba	-	-	51895	71803	30665	35455	35113
El Salvador	-	12052	19500	11236	-	24853	10706
Guatemala	-	690	39026	36163	8267	-	51494
Nicaragua	-	-	-	16854	-	-	-
U.S.A.	-	-	-	8006	4	-	10
Brazil	737	268662	214290	993239	366799	192120	148644
Colombia	-	-	-	61390	-	-	-
Guyana	-	-	-	10972	-	-	-
Peru	-	-	-	19875	-	-	-
Armenia	-	-	-	5000	-	-	-
Georgia	-	-	-	16942	-	-	-
Thailand	-	-	-	86400	6095	-	-
Oth.Countries	21	-	-	-	340	24568	-
TOTAL	772	301293	331617	1393605	412179	301633	245969
Sugar, white							
Czech Rep	-	540	24	1	1000	5000	3950
Latvia	-	-	-	2500	-	-	-
Lithuania	-	13040	33344	-	1005	508	190
Poland	88	10062	9251	27508	497	3	2941
U.K.	40	283	61	1061	-	-	-
EU	1013	24178	42697	31126	2546	5629	7186
Belarus	-	-	-	657	-	111267	55801
Moldova	-	-	-	-	21505	16187	20
Russia	-	-	-	-	32660	2482	239
Georgia	-	-	3800	39266	-	-	-
Kazakhstan	26380	19567	5248	5440	-	-	-
Oth.Countries	7	72	8130	1882	1	13	4
TOTAL	27400	43817	59875	78371	56712	135578	63250

Source: State Statistics Committee of Ukraine.

Policy Options

Basically, politicians have two options:

1. Abolish import tariffs and production quotas as well as minimum prices and allow free trade or
2. Keep up high border protection and allow producers to supply the domestic market. Export subsidies are no option under World Trade Organization (WTO) rules.

Apart from a few pockets of production, the first option would obliterate the domestic industry, given the limited competitiveness of beet sugar compared with cane sugar on the world market. From a purely economic point of view the first option would bring the highest return to the Ukrainian economy as domestic sweetener needs could be more cheaply met by imports from the world market. Given that the first option is a political non-starter due to the social and political consequences, the government is likely to follow the second route making Ukraine attractive for domestic and foreign investors as much still has to be done to make the sector more efficient.

During recent years no significant political decisions have been made to streamline the sugar sector. However, given the pressure on the domestic market and the impending WTO membership, the government now seems open to change. What should be changed first is the annual allocation of production and import quotas by the Ministry of Agricultural policy as this increases investment risks, provides no incentives for investments and even forces uneconomic sugar producers to remain in business. Moreover, it provides incentives for corruption. The best solution would be to abolish production quotas. This would lead to a much better allocation of resources, with the result of a rapid increase in efficiency. The danger is that in that case production could overshoot domestic demand with exports not a way out in the absence of export subsidies. An alternative would be the introduction of tradable quotas together with the abolition of minimum sugar prices. This would lead to considerable concentration which would be beneficial to productivity of the sector as a whole. There is general agreement that the sector does not need 120 sugar factories to produce about 2 mln tonnes of beet sugar annually. About 50 factories with about 5 sugar holdings would be sufficient. There is also broad consensus that the sector would need binding long-term tradable or auctioned quotas to stimulate investments. Major sugar holdings have already offered to pay the government for real sugar quotas if the quota period could be extended. In the case of tradable quotas the government must make sure that there is competition between the sugar holdings as otherwise the danger of regional monopolies would be fairly great. Such monopolies would mean a transfer of income from consumer to producer and

would leave sugar beet growers, in the absence of minimum beet prices, unprotected which cannot be in the interest of the government.

Table 10.2

Ukraine: Sugar exports, January-December (tons)

	2006	2005	2004	2003	2002	2001	2000
Sugar(a)	24402	45359	170418	453585	185248	87859*	166745*
Sugar, raw							
EU	-	-	-	-	-	10	-
Oth.Countries	-	7	-	-	140	2	20
TOTAL	-	7	-	-	140	12	20
Sugar, white							
Estonia	-	15	219	1883	57	-	75
Poland	487	9405	-	-	-	-	-
Slovakia	-	-	8452	-	-	-	-
EU	487	9431	8747	2197	109	1	86
Belarus	-	-	-	1453	-	-	-
Moldova	14	22261	76910	125299	5195	5207	1896
Russia	-	44	1990	895	-	68	-
Turkey	-	-	-	89295	-	-	-
Afghanistan	-	3606	1855	3157	10677	-	-
Armenia	-	-	10908	-	-	-	-
Azerbaijan	8930	-	27948	107545	100165	1611	-
Georgia	1546	3100	17581	60202	37568	-	2
Kazakhstan	11472	3260	4508	26236	6538	-	-
Kyrgyzstan	-	-	1586	-	2527	-	-
Tajikistan	-	-	1000	-	5875	-	-
Turkmenistan	-	-	-	-	1000	-	9404
Uzbekistan	-	-	2704	1009	625	-	-
Oth.Countries	1	21	1048	10	19	73932	141999
TOTAL	22450	41724	156785	417298	170299	80819	153387
(a) raw value							

Source: State Statistics Committee of Ukraine.

Investors seem convinced that the government will follow the second route and afford protection to the sugar sector. This is evidenced by increasing investment and structural change within the industry.

Table 10.3a

Ukraine: Sugar balance, September-August (1000 tons, raw value)

	2007/08	2006/07	2005/06	2004/05	2003/04	2002/03	2001/02	2000/01
Opening stocks	1129.8*	534.8*	589.8*	443.2*	607.5*	309.9*	525.1*	710.0*
Output	1960.0*	2837.0*	2054.0*	1947.0*	1687.0*	1557.1*	1803.0*	1686.2*
Imports	240.0*	16.5	76.2	348.3	640.1	1460.5	265.2	438.9*
Consumption	2305.0*	2250.0*	2150.0*	2100.0*	2150.0*	2350.0*	2195.0	2195.0*
Exports	45.0*	8.5	35.3	48.7	341.3	370	88.3	115.0*
Ending stocks	979.8*	1129.8*	534.8*	589.8*	443.2*	607.5*	309.9*	525.1*

Source: State Statistics Committee of Ukraine.

The leading sugar holdings in Ukraine take over control of the sugar supply chain. Vertical integration from sugar beet production to processing and marketing characterizes the corporate strategies of the market leaders UPK, UKRROS, ASTARTA, EVROSERVICE and DAKOR. Structural change is accelerating due to domestic and international sugar market developments. Investment is mainly driven by financially strong Ukrainian agribusiness holdings. Foreign Direct Investment in the Ukrainian sugar industry mainly comes from Russia. Evroservice is operating 8 sugar factories in Russia and 5 in Ukraine. The first Western European sugar holding entering the Ukrainian market is Pfeifer & Langen from Germany buying shares of two sugar factories in Western Ukraine. It is expected that they will increase the number of factories as opportunities arise. Also, Man Sugar from England recently bought shares of a sugar factory in South Ukraine. Distance to port facilities may have played a major role in this investment decision. It is interesting to note that the market leader UPK sold a sugar factory in Ternopil Oblast recently to a domestic buyer. Foreign Portfolio Investment has been observed for

ASTARTA (IPO at Warsaw stock market in 2006) as well as DAKOR and UKRROS (PP at Frankfurt stock market in 2007). Total foreign investment during the last 18 months is estimated at more than \$100 mln.

Table 10.3b
Ranking of Ukrainian Sugar Holdings, 2006/07 MY

Company	Number of sugar plants			Sugar produced per sugar plant, 1,000 t	Sugar produced, 1,000 t	Quota for 2007/08 MY, 1,000 t
	Operational	Not operational	Total	Operational		
UKRROS	6	0	6	41.6	249.9	188.6
INVESTAGROPROD.	2	1	3	40.2	80.3	76.7
ASTARTA	5	0	5	31.4	57.1	89.9
EUROSERVICE	5	0	5	29.9	129	103.2
DAKOR	4	2	6	25.8	103.3	66.9
INSAKHARPROD	3	0	3	24.6	73.9	44.5
UPK	13	1	14	23.3	302.4	235.3
Total Ukraine					2556.1	1740.0

Source: IER, AAA Consulting, 2007; MinAP Regulation.

The ranking of the leading sugar companies shows that the performance of the sugar holdings differs significantly. One of the key competitive factors is the sugar produced per sugar factory. It reflects the size of the factories, the length of the campaign and the efficiency of sugar processing. It is interesting to note that the performance of the market leader UPK is lowest. The highest growth rate of the leading sugar holdings shows ASTARTA. The least dynamic company is INVESTAGROPRODUKT mainly producing for its own food industry (confectionary under trade mark Roshen).

The leading sugar holdings try to increase quickly the share of farm land under their own control. Farm land is leased or shares of corporate farms are bought to ensure raw material supply and control of farm land. Also, sugar companies believe that own produced sugar beets are cheaper than those procured by contracts with sugar beet growers. An important aspect of this development is that the acquisition of currently cheap farm land will have a significant impact on the future structure of agriculture in Ukraine. It will give the leading sugar holdings a competitive advantage in view of future more dynamic land markets. Farm land prices — in particular for leasing farm land — will most likely increase in future due to expected liberalization of land markets, excellent opportunities for most agricultural commodities and shrinking availability of land for investors.

Table 10.4*Profitability of sugar imports before and after WTO accession*

Calculation:	Within WTO quota	Above quota after WTO	Above quota before WTO
i) Raw sugar price, USD/t, NYBOT FOB (as of 07.09.2007)	206		
ii) Sales Premium, USD/t	30		
iii) Polarization Premium, USD/t	13.77		
iv) Raw sugar price, USD/t, CIF: (=i+ii+iii)	249.77		
v) White sugar yield, %	97.6%		
vi) Raw sugar processing costs, USD/t	45		
vii) Raw sugar handling (loading and expedition) costs, USD/t	13		
viii) Official exchange rate, UAH/USD	5.05		
Import Duty Rates:	2%	50%	EUR300/t
a) Raw sugar price, USD/t, CIF: (=iv)	249.8		
b) Import duty, USD/t: (=iv • Imp. Duty Rate)	5.0	124.9	414.0
c) VAT (20%), USD/t: (=a+b) • 0.2	51.0	74.9	132.8
d) Raw sugar price after customs clearance, USD/t: (=a+b+c)	305.7	449.6	796.5
e) Raw sugar handling (loading and expedition) costs, USD/t: (=vii)	13.0	13.0	13.0
f) Raw sugar processing costs, USD/t: (=vi)	45.0	45.0	45.0
g) White sugar price, USD/t: (=d+e+f)/v	372.7	520.1	875.5
h) Pension Fund contribution (1% from currency exchange): (=g • 0.01)	3.7	5.2	8.8
i) Est. white sugar price, USD/t: (=g+h)	376.4	525.3	884.3
j) Maximum bidding price for import quota*, USD/t: (=k-i)	108.8	-40.1	-399.1
k) Domestic sugar price, USD/t: (=l/viii)	485.1	485.1	485.1
l) Domestic sugar price, UAH/t, EXW (as of 27.08.2007)	2450		

Source: Own calculations based on sugar industry figures. * this would be the maximum amount to be shared by quota sellers and buyers if quotas were traded.

The WTO challenge

A challenging task for the Ukrainian Government and the sugar industry is to adapt the sugar market regime to WTO requirements after accession of Ukraine to the trade organization. Currently, the import duty on sugar is 50% of the import price, but not less than EUR300 a tonne. However, as Ukraine becomes a WTO member, only the ad-valorem component will remain (50%). At the same time a tariff quota of 260,000 tonnes of raw sugar would be introduced with a 2% import duty. Approximate calculations of the domestic price of white sugar produced from raw sugar under different import regimes are summarized in the

table above. The first import regime shows the calculation within the WTO tariff quota import with 2% import duty, the second is over-quota import with 50% import duty and the last one is the current regime with a specific import duty of EUR300/t. It is evident that raw sugar imports within the WTO tariff quota are very profitable (more than \$100/tonne). According to economic theory this profit constitutes a rent to be shared by quota sellers and buyers. In a transparent auction this would be the maximum price to bid for and in a closed corrupt environment it would be the maximum amount to be paid to corrupt civil servants distributing the quota. Imports above the quota are not profitable, assuming current international sugar prices. Even WTO membership and/or increasing international sugar prices would not change this picture.

Also, sugar exports are unlikely. Ukraine has accepted an abstention from export subsidies during its negotiations with WTO but continues to protect the sugar sector by considerable import tariffs (50 %). Possible future sugar exports would be regarded as subsidized by other sugar exporting WTO members. Thus, the sugar produced in Ukraine will be mainly used for domestic consumption. Sugar trade beyond the WTO tariff quota will not play a significant role in future. Recent announcements of the Government to introduce sugar import/export licenses point also in this direction.

Outlook

After elections and instalment of a new Government, the likelihood increases that the sugar policy will be changed in favour of the big players. This would probably mean auctions or tenders for binding and tradable domestic sugar and sugar beet production quotas together with probably some additional tax incentives for investors. However, given current cost structures, Ukraine is unlikely to regain the position of a sizeable net exporter that it had during Soviet times.

11. The Quotas on Grain exports in Ukraine

This joint policy note of the German Advisory Group and the World Bank was produced in October 2006 as a reaction to the introduction of quota system on exports of grain in Ukraine in 2006. The paper analyses various justifications of the implementation of quantitative restrictions on grain exports and concludes that quota not only imposes large losses primarily on grain producers and hurts domestic and international grain traders but is also an ill-advised and poorly targeted measure to protect the poor in Ukraine. Since many of Ukraine's farmers actually belong to lower income groups, the quota directly hurts many of the rural poor. Far more effective measures would be to use means tested cash transfers to compensate the poor for higher food prices. This would have the advantage to directly benefit the poor, and not all Ukrainian consumers. The paper's main recommendation is therefore to abolish the quota system as soon as possible.

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Is the quota justified to ensure domestic food security?

The imposition of a quota only affects prices if the quota is in fact binding. The quota for grain exports introduced in October amounts to a total of 1.603 million metric tons (MMT), with 0.6 MMT respectively for barley and corn, 0.4 MMT for wheat and 0.003 MMT for rye. The quota is currently valid for the remainder of 2006. A new draft Cabinet of Ministers resolution published 22 November would bring the quota for the year to 2.873 MMT for the 2006/2007 marketing year, with 0.73 MMT for wheat, 1.3 MMT for barley, 0.84 MMT for corn, and 0.003 MMT for rye. Government sources expect Ukrainian grain exports in the 2006/07 marketing year to amount to 9.5 MMT. What this implies for further relaxation of the quota during the course of 2007 remains unclear.

How do these numbers compare with production and net export data in recent years? Official data on wheat production, net exports and in particular storage are incomplete, often published with considerable lags and considered unreliable by many market participants. This lack of quality statistics is in itself a significant hurdle for the operation of grain markets. A series of private data sources are available, as well as data from the United States Department of Agriculture. In this paper, we use data from the private market information agency UkrAgroConsult.

Table 11.1
Total Grain Supply, Demand, Net Exports and End-Year Stocks

TOTAL GRAIN	2003/04	2004/05	2005/06	2006/07*
Total Grain Crop	20,320	37,957	36,622	34,933
Imports	3,725	160	185	177
Total Supply	26,072	39,459	39,273	37,814
Food Industry	7,820	8,200	7,910	8,025
Feed Usage	10,535	12,400	10,575	11,570
Seeds	2,520	2,815	2,830	2,820
Losses	967	2,295	2,015	1,935
Total Domestic Use	21,842	25,710	23,330	24,350
Exports	2,888	11,283	13,239	10,295
Ending stocks	1,342	2,466	2,704	3,169
Stocks/Use %	5.4	6.7	7.4	9.1

Source: UkrAgroConsult.

Table 11.1 tracks the supply and demand (S&D) estimate for Ukraine for the last three marketing years plus the current 2006/07 marketing year. The S&D estimate for wheat is attached in Table 11.2. The total 2006/07 grain crop of Ukraine is estimated to amount to approximately 35 MMT. This is below last year's crop of 36.6 MMT, but nevertheless well above the ten year average and much higher than the low 2003/04 crop. Moreover, grain stocks at the end of the 2005/06 marketing year were large. Thus, the total supply of grain in Ukraine — ending stocks of the last marketing year plus the year's crop and grain imports — is very large: 37.8 MMT. The total domestic use of grain is expected to increase to 24.4 (last year: 23.3) MMT, especially due to growing demand from the livestock sector. This would, however, still allow for total exports considerably above the Government's forecast of 9.5 MMT. Indeed, assuming exports stayed at the levels of 2006/2006, which was a record year, there would still not be any shortage on the domestic market while taking a more conservative export forecast of 10.2 MMT provided by UkrAgroConsult end-year stocks of grain would actually increase.

The situation is quite similar for the wheat S&D statistics, which are part of the total grain S&D statistic. The 2006/07 wheat harvest was well below previous years due to the dry autumn last year and some winter kill, which reduced both harvested acreage and yield. However, a wheat crop of close to 14 MMT is still an average crop and clearly much higher than the crop of 2003/04. Taking total supply and forecast domestic demand (with a slight increase in the share of fodder wheat due to insect damage), exports of close to 5 MMT would still be possible. In fact, UkrAgroConsult forecasts wheat exports to total only 2.8 MMT, which is still well above the currently allocated quota.¹⁸⁰

The lack of justification of the quota is most obvious for the case of barley. The 2006/07 barley harvest reached a ten year high. And despite a very large increase in domestic use to 6.4 MMT (last year: 5.3), exports could increase by over 50% without exhausting stocks. Note in addition that barley is mainly used for feedstock and thus a quota on barley exports has no direct impact on food security.

Until the end of September, when Ukrainian grain exports were stopped, the country had exported 1.62 MMT of wheat and almost 2.2 MMT of barley. Exports in October, which were already within the quota, amounted to 0.388 MMT of wheat and 0.496 MMT of barley. Thus, total exports for the 2006/07 marketing

¹⁸⁰ The argument is sometimes made that due to the lower quality of the wheat harvest, available milling wheat may not exceed domestic demand by much and hence the quota on wheat exports (particularly if increased to 0.73 MMT) is adequate. However, the distinction between feed wheat and milling wheat is ultimately a question of degree and price rather than kind. In bad years, millers will accept lower quality wheat and can if necessary make up the difference through purchasing supplements. Moreover, the quota makes no distinction between flour and fodder wheat.

year to date are 2 MMT for wheat and 2.7 MMT for barley. Adding the unallocated amount of the proposed revised quota (0.35 MMT for wheat and 0.8 MMT for barley), the resulting figures are still well below the numbers which would lead to a decline in wheat and barley stocks. The quota is therefore clearly unjustified from a domestic food security point of view and very clearly highly binding.

Table 11.2
Total Wheat Supply, Demand, Net Exports and End-Year Stocks

WHEAT	2003/04	2004/05	2005/06	2006/07*
Crop	4,250	16,529	17,910	13,809
Imports	3,400	5	10	10
SUPPLY	9,078	17,462	19,207	15,795
Food Industry	5,700	5,800	5,750	5,700
Feed Usage	1,000	3,900	3,000	3,200
Seeds	1,100	1,350	1,100	1,200
Losses	300	800	900	750
Total Domestic Use	8,100	11,850	10,750	10,850
Exports	50	4,325	6,481	2,800
Ending stocks	928	1,287	1,976	2,145
Stocks/Use %	11.4	8.0	11.5	15.7

Source: UkrAgroConsult.

Table 11.3
Total Barley Supply, Demand, Net Exports and End-Year Stocks

BARLEY	2003/04	2004/05	2005/06	2006/07*
Crop	7,450	10,615	8,824	11,998
Imports	40	15	20	5
SUPPLY	7,736	10,816	9,515	12,315
Food Industry	350	500	450	500
Feed Usage	4,600	3,900	3,300	4,100
Seeds	900	930	1,200	1,100
Losses	180	500	300	580
Total Domestic Use	6,030	5,830	5,250	6,280
Exports	1,520	4,315	3,953	5,200
Ending stocks	186	671	312	835
Stocks/Use %	2.5	6.6	3.4	7.3

Source: UkrAgroConsult

The costs of the quota: large losses for grain producers, lower export revenues, potential negative effects on future investment, increased risk of corruption

The imposition of quantity controls is under any circumstances a very inefficient and blunt policy tool to achieve a stated objective. The losses to an economy and society are always greater than the gains. This basic principle is a widely accepted result in trade economics, and has influenced the strong position taken for instance in the GATT Article IX, paragraph 1, against the imposition of quantitative restrictions. Annex 1 explains the economic argument with the help of a simple diagram, which shows that the losses suffered by domestic producers are always larger than the gains to consumers.

How much are grain producers in Ukraine losing as a result of the quota? The size of these losses depends on the impact of the export quota on farm gate prices. Figure 11.1 provides information on wheat price developments since the beginning of 2006 in Ukraine and on world markets. Since mid-2006, FOB prices (Free On Board, in the US and the EU), which represent the world market price level, have increased from roughly 140 to 200 US\$/t. These price movements have been driven by indications that world grain production will fall short of consumption in the 2006/07 marketing year. Rising demand for food production and biofuel together with lower than expected grain production in the US and the EU and the devastating drought in Australia have fuelled the sharp price rises. The Ukrainian export quota has also contributed to higher world market prices in other countries.

Figure 11.1 mirror world market prices minus a margin of roughly 25 US\$/t. Since the imposition of the quota, however, this margin has increased to roughly 50 US\$/t as Ukrainian grain price developments have been divorced from corresponding world market price developments, and Ukrainian EXW prices have remained essentially constant.¹⁸¹ The result is that 25 US\$/t less is being paid for grain at the EXW level than would be the case without the export quota system. It is safe to assume that the resulting reduction in farm gate prices is at least as large. Assuming that this reduction in farm gate prices is maintained over the entire marketing year, wheat producers stand to lose a total of US\$ 350 million in revenues (25 US\$/t over 14 million t). If farm gate prices for all grains fall by a similar amount, revenue losses of US\$ 875 million could result.¹⁸²

¹⁸¹ The Ukrainian FOB price in Figure 11.1 is, since the implementation of the quota, essentially a fictional price, as no (official) trade is taking place at the moment.

¹⁸² The impact on poverty would depend on the distribution of agricultural revenues across the rural population, on which we know little. The household budget survey does show that the poor are more likely to live in rural areas, and average agricultural salaries are well below the national average. How revenues are distributed within farms is something that would require deeper analysis, but it is plausible that the reduction in revenues would on balance hurt the poor in rural areas and thus may actually increase overall poverty.

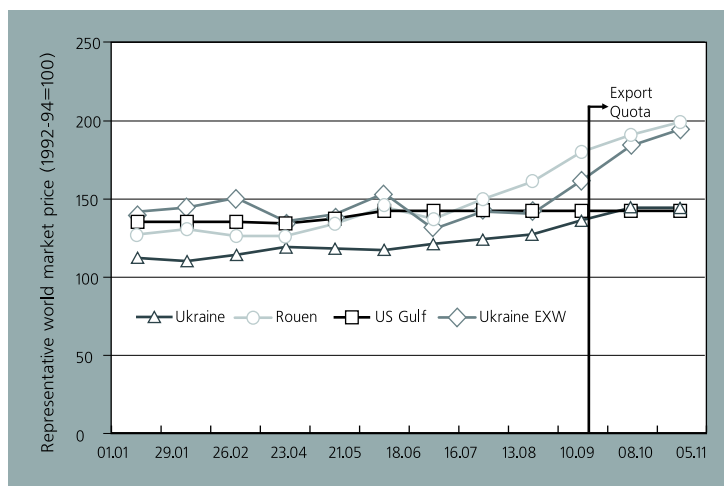


Figure 11.1
Weekly FOB wheat prices since Jan. 1, 2006 (US\$/t)

At the same time, Ukraine as a whole is losing export revenues and the corresponding foreign currency earnings as a result of the quota. If the price relations prevailing in the first 8 months of 2006 are taken as a guideline, FOB prices for Ukrainian wheat would have followed the international trend and would be in the neighbourhood of 190-200 US\$/t at the moment, if not for government interference in the form of the export quota. Using this price, and a (conservative) average monthly export volume for wheat before the quota in the order of 0.5 MMT (which corresponds to slightly less than the average monthly wheat exports during the previous four seasons), Ukraine is currently foregoing export revenues for wheat in the range of USD 100 million per month. For barley, similar calculations based on average exports of 0.4 MMT and a FOB price in the neighbourhood of 140 US\$/t suggest additional forgone monthly export revenues of another USD 60 million. For corn, losses would range around US\$ 30-40 million. Until mid November, these losses accrued fully because effectively no official exports were taking place. Since then, limited exports have resumed under the quota system. Nonetheless, based on the estimates, we can safely assume that the current quota for grain exports until end 2006 effectively cuts grain exports to 1/3 or so of their level without quota. The estimated total reduction in export earnings until year end would thus amount as a minimum to approximately to US\$ 300 million and increase the current account deficit by 0.3% of GDP all else equal.¹⁸³

¹⁸³ Estimated exports from Oct-Dec without quota 1.5 MMT wheat, 1 MMT barley. Losses if quota is fully utilized are 1.1 MMT of wheat * USD200, 0.4 MMT barley * USD140, totals USD 304 million.

Proponents of the export quota might object to these calculations by pointing out that these export revenues are only temporary and can be recouped later on, if the quota was to be lifted or relaxed and exports re-allowed. This reasoning misses two important points, however. First delayed exports result in a number of costs. The grain in question must be stored in the interim, which leads to financial losses in the form of bound capital, and quality losses in storage. Moreover, real economic losses accrue to grain traders, who have hired transport ships, at the cost of several tens of thousands of US\$ per day. Second, there are obvious limits to Ukraine's storage capacity, and given the S&D statistics presented above, not all producers will be able to wait things out. The opportunity costs of not being able to export today could thus be significant, particularly for smaller producers without access to their own storage.

In fact, if the purpose of the export quota — to lower consumer prices for grain and grain-based products — is taken seriously, then over the marketing year there must be some significant net reduction in exports (so that domestic supply is significantly increased and prices are effectively reduced). Hence, a reduction in net export revenues is the inevitable price that Ukraine pays for implementing a binding quota.

These are only the immediate financial damages caused by the export quotas. The indirect damages due to corruption, loss of investment and damage to Ukraine's reputation could be significantly higher in the long term:

✓ **Corruption:** As a result of the difference between the domestic and world market price, there is a great incentive to obtain export quotas. For instance, if the difference between the domestic and international price for wheat is around US\$ 25/ton and if the allowable quota is 0.4 MMT for wheat, then the value of this quota is US\$ 10 million until the end of 2006. This is a pure profit transferred directly to the enterprise that was able to obtain the quota and represents a significant incentive for corruption. If the government allocates the quota on a competitive basis, some of these profits could be recouped through an auction. However, so far, the quota system has been administered in a largely non-transparent way.¹⁸⁴

✓ **Loss of investment:** The export quotas for grain make mockery of government claims that it welcomes and wants to attract foreign investment in agriculture. The total stock of FDI in agriculture amounted to US\$294 million as of April 2006, with significantly higher numbers in the downstream food industry. The

¹⁸⁴ Initially, the Ministry of Economy favored an allocation on a first-come, first-served basis. Later, the idea of an auction was floated. In the event, general regulations were issued in mid-November, which would appear to leave significant room for discretion and also require any applicant to have grain in storage by the time of the application. This creates the risk that the grain is purchased by a trader and stored but the quota is not obtained. This is clearly not in line with international practices.

de facto export ban hits firms that have been at the forefront of efforts to modernize and transform Ukrainian grain production and marketing, and have invested in upgrading grain storage, transportation and port infrastructure. This investment, the corresponding jobs and transfer of know-how are at risk, if Ukraine's Government is perceived to be an unreliable partner.

✓ **Loss of reputation:** Ukraine is an important European grain exporter. For international grain traders, reliability of supply is important. The introduction of the quota and the subsequent complete stop to grain exports for a couple of weeks have not only imposed direct financing, storage and shipping tonnage costs on producers and grain traders, but also meant that some traders were unable to fulfil delivery orders at the other end on time. This has a price, too, and means that Ukrainian grain may henceforth be traded at a discount to compensate for export and delivery risk. The loss of reputation is naturally highest in the grain market, but it could extend to other sectors where foreign investors may ask for a risk premium to compensate them for the uncertainty surrounding government policy.

✓ **WTO membership at risk:** A final economy-wide cost of the quota is that it may cause complications to Ukraine's WTO accession bid. As noted above, under paragraph 1 of Article XI of the GATT, quantitative restrictions are in principle ruled out. Since this concerns an agricultural commodity, the rule can be waived if the quantitative restriction is needed to support domestic agricultural policies. In fact, however, Ukraine would have a hard time justifying its stance on acceptable principles. First, with the grain harvest at 35 MMT in 2006, there is no real issue over food security that would justify an export limitation. In fact, Ukraine still applies an import tariff of 20 Euro per ton on corn,¹⁸⁵ rye and barley and of 40 Euro per ton on wheat. WTO members could reasonably ask for this to be removed first, if the issue was one of immediate food security (as provided for in the so called "safeguard clause"). Second, from the point of view of supporting agriculture, the present quota makes no sense at all, since the bulk of the costs are in the end borne by grain producers. However, we use the cautious formulation "may cause complications" above because WTO members tend to be far more sensitive about import than export restrictions. Indeed, if anything, Ukraine is as a result of its export restriction subsidizing grain exporters from Russia and Europe, who are gaining market share and benefiting from marginally higher prices given the lack of supply from Ukraine.

¹⁸⁵ The tariff on corn is 20 EUR/ton or 25% ad valorem, whichever is lower.

Who gains from the quota? Flour and feed producers, not consumers

Despite its large costs, proponents of the quota may still argue that these costs are only borne by international grain traders and hence don't really hurt average Ukrainians, whereas the benefits of lower domestic food prices are widely shared and particularly welcome for the poor. This argument is not borne out by evidence.

As Figure 11.2 suggests food prices have on the whole tended to dampen rather than push consumer price inflation over the most recent 12 months. Flour and bread represent 0.54% and 3.87%, respectively, of the consumer price basket. Thus while the price of bread has an important symbolical value in a country that experienced one of the worst famines ever recorded in the 1930s, it is not a major contributor to the cost of living. Even if the recent rise in international grain prices had been fully passed through to domestic consumers this would have led only to an increase of 1.75 percentage points in the CPI.

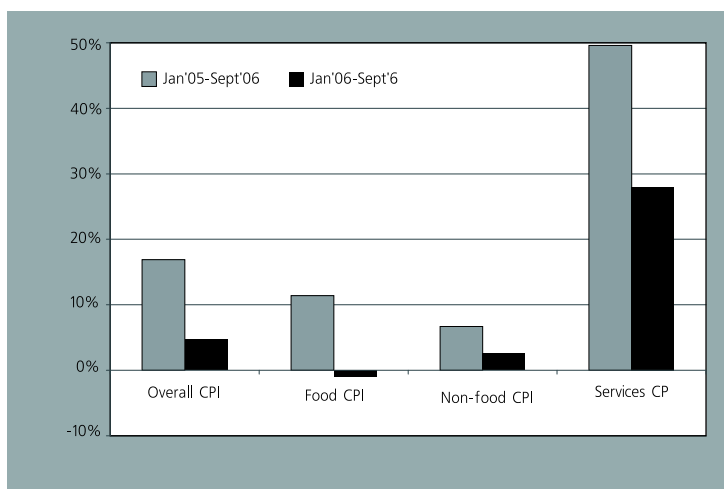


Figure 11.2
Consumer price inflation by source in Ukraine—January 2005 to September 2006, and January—September 2006 (%)

In fact, since the imposition of the grain quota, flour and bread prices have increased, by 2.3% and 2% respectively in the month of October. This has happened although the domestic price of wheat has been constant since the summer. Hence, whatever benefit has been derived from keeping grain prices low has not been passed on to consumers so far. One reason why this is the case is that the price of flour and bread reflects a host of factors, including the price of energy, wages, transportation to market and a retail margin. Energy prices, for instance,

have increased significantly in the domestic market since the summer and this may account for higher flour and bread prices.

In some instances, even abstracting from other cost factors, the impact of lower grain prices on consumer food prices will be effectively nil in the short run. Take the livestock feeding sector as an example. Since the stock of animals to be fed is more or less fixed in the short run, the demand for feed grain is also more or less fixed. Thus should feed grain prices fall, this will have no immediate impact on the supply of meat and cattle and hence no immediate impact on meat and dairy prices (a somewhat price elastic supply curve may exist in the poultry sector). Furthermore, in particular in the pig and poultry industry meat and feedstock production are vertically integrated and relatively highly concentrated. In the absence of competition there is no reason why meat or feed producers should pass lower costs on to their customers. There is every reason to fear, therefore, that the net impact of export quotas will largely be to tax farmers at one end, and inflate the profits of meat producers and feed and flour mills at the other, with little or no noticeable impact on consumer prices, at least in the short run.¹⁸⁶

At the conceptual level, export quotas are an exceedingly ill-targeted tool to help consumers who are truly threatened by food price inflation. To the extent that export quotas for grain really do result in a measurable reduction in food price inflation, all consumers benefit; rich and poor. There is no denying that increasing food prices could represent a significant burden to poor Ukrainians. But certainly not to all Ukrainians, many of whom have benefited from increasing real incomes over the last five years of economic growth. A significant share of whatever benefits the export quotas generate will not go to help poor consumers but rather be “wasted” on consumers who can actually afford to pay more for food.

In summary, the argument that export quotas are designed to support consumers is weak. Experience with similar interventions in Ukraine and elsewhere shows that it is often instructive to consider whether perhaps there are other “hidden” beneficiaries, who are using populist arguments as a cover for other motives. In particular, anyone who manages to export despite the export quota system (i.e. smugglers or those who succeed in bribing officials) will profit handsomely. Based on the price data presented in Figure 11.1 above, the margin between the world market price for wheat and the corresponding EXW price in Ukraine is currently roughly 25 US\$/t higher than is usually the case. We noted above that for wheat alone this provides a pure profit to anyone able to export totaling US\$10 million until end 2006. This profit provides both a powerful incentive to get around the export quota system, and the financial means of “persuasion” to

¹⁸⁶ Note that one of the stabilizing factors for meat and poultry prices in 2006 has been the export ban on Ukrainian meat imposed by Russia. However, no one has argued so far for keeping this ban in place to stabilize domestic meat prices.

do so. Indeed, many observers suggest that the underlying purpose of the export quota system is not to reduce exports but rather to make them more lucrative (at the expense of Ukrainian farmers) and to redirect the proceeds into certain pockets.

Policy recommendations

The grain quota is a costly tax on producers and investors in the agricultural sector. It is an ill-advised policy instrument, giving rise to fears of corruption and damaging Ukraine's reputation. Moreover, taxing farmers to help consumers (even if it were more effective than we show to be the case presently) is clearly inconsistent with the stated policy goal of supporting agriculture in Ukraine. Indeed, according to the draft 2007 budget, 7.3% of total public expenditure will be channeled towards agriculture, the equivalent of 1.8% of Ukrainian GDP. It is contradictory to give this money to agriculture with one hand, and take it away via export quotas with the other. Clearly, it would make more sense to reduce farm subsidies and use the resulting fiscal space to reduce taxes (thus helping consumers) and/or provide consumers with direct income transfers to help them cope with increased food prices.

The main policy recommendation that follows from the analysis in this short note is to abolish the export quota as soon as possible. Time counts, because of the costs that even a temporary quota imposes both financially to grain producers and traders and by damaging Ukraine's reputation. The gains, as this note argues, are skewed to the benefit of flour and feed mills as well as meat producers rather than consumers at large, and in any case an export quota is a particularly blunt and distortive instrument to shield consumers from the effects of rising world grain prices.

Nonetheless, it is important to realize that grain prices may play an important political role. Indeed, interventions into the grain market are not new in Ukraine and have been justified in the name of food security in the past. Should the government be genuinely concerned about the impact of rising grain prices on the poor, the first best policy would be to a cash transfer system targeted to the poorest segments of the population. As the government deals with the social impact of administrative price increases for energy and municipal utilities, adding a small cash transfer program calibrated on developments in domestic food prices would not represent a significant additional difficulty. Such transfers should ideally be funded from general government revenue (and, indeed, fiscal space for them could be easily created by limiting and reorienting wasteful agricultural subsidies). In the extreme case of an acute revenue shortage, an export tax on grain would still be preferable to the quota system since it does not create the same risks of corruption, whilst generating the same effect of lower domestic

prices. However, because Ukraine has no market power in the international grain market, it will still lose significant export revenues from an export tax, which will translate into lower producer incomes. As we have argued in this note, the current supply and demand situation in Ukraine's grain market hardly justifies any government intervention.

The abolition of the grain export quota is one way for the Ukrainian government to reconfirm its market orientation and reformist credentials. The sooner it happens, the better for average Ukrainians.

12. The Determinants of Dairy Farming Competitiveness in Ukraine

The WTO accession and the expected free trade agreement with the EU pose significant challenges for the Ukrainian agriculture and food industry. This chapter sheds light on the competitiveness of dairy farming in Ukraine using Domestic Resource Cost (DRC) calculation and regression analysis. It was produced in 2008 at the University of Goettingen. The results of the analysis show that based on data from the year 2005 only 20% of Ukrainian dairy farmers are competitive. The major determinants of competitiveness are farm size and dairy and labor productivity. As concerns farm size the largest positive impact on competitiveness is reached for a herd of roughly 900 cows. Total subsidies received by farms are to be found to have a slightly negative impact. These results allow recommending the replacement of the current subsidy mechanism in the dairy sector by targeted support programs to increase investments aiming at improving milk yields, milk quality and labor productivity

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Introduction

The relationship between subsidies, efficiency and technology of production has been a topic of considerable interest to policy makers and researchers. From a policy making point of view there are two opposite approaches that different countries or regions have been following. The European Union, on the one hand, is traditionally considered as a region of heavily subsidized agriculture with its percentage PSE¹⁸⁷ being at 37% in 2003 (OECD, 2006). On the other hand there are countries having low subsidization levels, e.g. New Zealand with only 2% percentage PSE in 2003 (OECD, 2006). An important question is which strategy performs better in terms of improving the efficiency of production¹⁸⁸ — one of the primary goals of agricultural policy. Having rich natural endowments (climate, soils, and geographical location) and assuming that agricultural policy makers consistently pursue higher efficiency goals to increase its share on international markets, Ukraine can be expected to gradually restructure its agriculture into an internationally competitive and efficient sector. However, some Ukrainian policy makers, supported by influential lobby groups, insist on state subsidies requiring more and more funds for agriculture each year from the budget. EU spending levels are posed as an example to be followed. But does it comply with improving efficiency goals? Is it fiscally sustainable for Ukraine? Does it make Ukrainian agriculture stronger and competitive?

Economic literature, although having some theoretical background about the relationship between subsidies and efficiency, provides relatively few empirical evidences on that issue. Leibenstein (1966) found that technical inefficiency or X-inefficiency increases cost of protection¹⁸⁹ by up to 50 percent. He explained that firms fail to operate at the outer-bound of their production possibilities frontier by non-optimal allocation of managerial effort and in many cases this phenomenon is caused by firms' protection. Bergsman (1974) and Balassa (1975) corroborated later Leibenstein's theoretical framework arguing that protectionism, by increasing technical inefficiency, generates substantial welfare losses unaccounted for by conventional costs of protection calculations. Within the same analytical framework and based on Ghana's industries Martin and Page (1983) also showed that direct aids have negative impact on the total managerial effort and finally on technical efficiency. Bergstrom (1998) also argues that subsidies can have a negative impact on technical efficiency mainly because of weakening managers' motivation.

¹⁸⁷ Percentage PSE is a share of the Producer Support Estimate (PSE) in the value of total gross farm receipts.

¹⁸⁸ In this paper we use output technical efficiency scores showing the ratio of outputs of given producers and best producers given the same amount of inputs or costs they have. For the exact definition of output technical efficiency, please see the Methodology section of the paper.

¹⁸⁹ Protection here is defined in a broader sense, including subsidisation.

For agriculture there are several empirical studies available confirming this negative relationship.

Lassaad (1994) investigating USA dairy price support policy corroborated Leibenstein's X-inefficiency hypothesis. Karagiannis and Sarris (2002) showed that CAP land set aside program and price declines compensation program tended to decrease technical efficiency in Greek agriculture. Rezitis et al. (2003) also report about the negative impact of subsidies granted to Greek farmer after EU accession on Greek farms' technical efficiency. Giannakas et al. (2001) draw the same results for farms in the Province of Saskatchewan in Canada.

This paper employs econometric analysis in order to determine the impact of subsidies on efficiency and technology of Ukrainian agriculture, based on 2004—2005 data from 4805 dairy farms. The paper is structured as follows: The methodological and data description section continues the paper. Then it follows the description of subsidy programs considered in our analysis. The empirical results and their discussion come next. Finally, conclusions and policy considerations wrap up the paper.

Methodology and data description

Data description

The empirical analysis employs a farm level panel data on input-output and subsidies information provided by the State Statistics Committee of Ukraine. The balanced panel set (Sample 1) contains 4805 farms over the period 2004—2005 (i.e. 9610 observations). Based on this set of data we provide a general sector subsidies profile and some general sector specific performance indicators (see next sections for details).

However, for getting reliable technical efficiency estimates only specialized dairy farms are used. This decision is done because of data quality considerations; it concerns especially those farms with only a few cows in the herd. As Table 12.1 shows, there are only three input and one output indicators available for dairy farming technical efficiency estimation. Herd size and output accounting is possible with high degree of accuracy. But, since usually dairy farming is not the only activity undertaken by farms, it is difficult to account precisely the amount of costs and labour allocated for each particular activity. So, in such a situation specialization might increase the reliability of data available.

The sample of specialized dairy farms (Sample 2) was selected from Sample 1 based on specific selection criteria, using farms' revenue and costs information. For each farm contained in Sample 1 we calculated the shares of revenues and costs that farms receive from outputs or invest in factors for each particular ac-

tivity undertaken on a given farm. So the Sample 2 includes specialized farms having largest shares of revenues received or costs invested in dairy production. After “cleaning” Sample 2 of outliers (see section 2.2 for details) we received the unbalanced panel set containing 1375 observations from 689 and 686 farms over the period 2004—2005 respectively (see Table 12.1 for data description).

Table 12.1
Variable Definition and Summary Statistics

Period: 2004	Number of farms: 689				
Variable	Definition and units of measurement	Mean	Std. Dev.	Min	Max
GVI	GROSS VALUE OF INPUTS, THD. UAH	653.3	808.2	17.4	8974.3
Herd size	Annual average herd size, number of cows	306.8	264.5	12	2477
Labour	Thd. Man-hours	76.8	71.4	2	598
Output	Tons	997.7	1209.9	14.9	9482.7
Period: 2005	Number of farms: 686				
Variable	Definition and units of measurement	Mean	Std. Dev.	Min	Max
GVI	GROSS VALUE OF INPUTS, THD. UAH	843	1026.5	10.1	10081
Herd size	Annual average herd size, number of cows	296.8	268.6	14	2705
Labour	Thd. Man-hours	74.3	74.6	1	817
Output	Tons	1062.2	1299.1	5.1	10961

Source: Own presentation.

Measurement of Individual Efficiency

In this paper for individual efficiency estimates Farrell-type output oriented technical efficiency is used and defined as (see Grosskopf et al, 1994):

$$TE_0(x, y) \equiv \max \{ \theta : (x, \theta y) \in T \}, \text{ where}$$

defined as technology accessible to all enterprises under the consideration and formally written as

$$T \equiv \{ (x, y) : \text{can produce } y \}.$$

Based on Sample 2 data $TE_0(x, y)$ scores are estimated under the Variable and Constant Returns to Scale (VRS and CRS respectively) assumptions using Data Envelopment Analysis (DEA) approach. $TE_0(x_k, y_k)$ scores measured under VRS assumption provides “pure technical efficiency”, that is efficiency free of scale effects.¹⁹⁰ Whenever $TE_0^r(x_k, y_k)=1$, firm k is asserted to be *technically* efficient relative to frontier of group r , otherwise, when $TE_0^r(x_k, y_k)>1$, it is *technically* inefficient. Efficiency score of a firm k can be represented in percentages, i.e. $(1/TE_0^r(x_k, y_k))*100\%$ and its inefficiency score would then be $(1-1/TE_0^r(x_k, y_k))*100\%$.

Due to the one of the few assumptions imposed on DEA model (i.e. we cannot observe any observation beyond the frontier) $TE_0^r(x_k, y_k)=1$ might be sensitive to outliers. Therefore, so-called “Jackstrap” technique (Stosic and Sampaio de Sousa, 2003) is utilized to detect those possible outliers. In this paper an algorithm employing Heaviside step function as the outliers’ detection criteria is used.

The other efficiency measure considered in this paper is output scale efficiency. From an economic point of view production process (technology) exhibiting constant returns to scale (CRS) property is considered as optimal or the most efficient in terms of scale, since it gives minimum average costs. So scale efficiency gives an indicator on how the reference technology of the production unit is far from optimal or CRS technology. Output scale efficiency is measured as:

$$SE_0(x_k, y_k) = \frac{TE_0(x_k, y_k) | VRS}{TE_0(x_k, y_k) | CRS}$$

Also, unknown distributions of random variables (individual output technical efficiency scores etc) are estimated using Rosenblatt (1956) kernel-based estimate of unknown univariate density function with Gaussian density kernel function. The obtained density estimates are then plotted for visual presentation and comparison of distributions.

Efficiency and Technology Change Measurements

To learn how individual efficiency and technology evolved over time, the elements of the standard decomposed Malmquist Output-Based Productivity Index

¹⁹⁰ In the single output case TEo is merely the ratio of the potential (maximal) output to the actual output that can be produced with the same level of input.

are utilized (see Simar and Wilson, 1998):

$$\begin{aligned}
 M(x_k^{t_1}, y_k^{t_1}, x_k^{t_2}, y_k^{t_2}) &= \underbrace{\left(\frac{TE^{t_1}(x_k^{t_1}, y_k^{t_1}) | VRS}{TE^{t_2}(x_k^{t_2}, y_k^{t_2}) | VRS} \right)}_{=\Delta PureEff} \times \underbrace{\left(\frac{TE^{t_2}(x_k^{t_2}, y_k^{t_2}) | VRS / TE^{t_2}(x_k^{t_2}, y_k^{t_2}) | CRS}{TE^{t_1}(x_k^{t_1}, y_k^{t_1}) | VRS / TE^{t_1}(x_k^{t_1}, y_k^{t_1}) | CRS} \right)}_{=\Delta Scale} \\
 &\times \underbrace{\left(\frac{TE^{t_2}(x_k^{t_2}, y_k^{t_2}) | VRS}{TE^{t_1}(x_k^{t_2}, y_k^{t_2}) | VRS} \times \frac{TE^{t_2}(x_k^{t_1}, y_k^{t_1}) | VRS}{TE^{t_1}(x_k^{t_1}, y_k^{t_1}) | VRS} \right)^{1/2}}_{=\Delta PureTech} \\
 &\times \underbrace{\left(\frac{TE^{t_1}(x_k^{t_2}, y_k^{t_2}) | VRS / TE^{t_1}(x_k^{t_2}, y_k^{t_2}) | CRS}{TE^{t_2}(x_k^{t_2}, y_k^{t_2}) | VRS / TE^{t_2}(x_k^{t_2}, y_k^{t_2}) | CRS} \times \frac{TE^{t_1}(x_k^{t_1}, y_k^{t_1}) | VRS / TE^{t_1}(x_k^{t_1}, y_k^{t_1}) | CRS}{TE^{t_2}(x_k^{t_1}, y_k^{t_1}) | VRS / TE^{t_2}(x_k^{t_1}, y_k^{t_1}) | CRS} \right)^{1/2}}_{=\Delta ScaleTech}
 \end{aligned}$$

First of those Malmquist productivity index components is Pure Efficiency Change ($\Delta PureEff$), which captures “pure” technical efficiency change free of technological and scale effects. In other words this component measures the change in the “distance” between a given dairy farm and the best practice reference dairy farms between times t_1 and t_2 . The rest components reflect the change in production unit technology and its properties. Scale Efficiency Change ($\Delta Scale$) reflects changes in the scale efficiency of the production unit. In other words, $\Delta Scale$ demonstrates whether production unit approaches or moves away from its optimal production scale. $\Delta PureTech$ or Pure Technological Change component, measures pure change (shift) of production technology. For these three components values greater than 1 indicate positive change, while less than 1 indicates negative change. Finally, $\Delta ScaleTech$ or Change in the Scale of Technology indicates the change in the shape of the technology between times t_1 and t_2 . The idea here is similar to $\Delta Scale$, however in this case we measure whether the reference for the production unit technology changes its scale properties. If $\Delta ScaleTech < 1$, then production technology improves its scale property and approaches CRS, while $\Delta ScaleTech > 1$ indicates changing away from CRS.

After having received the above-explained efficiency and technology change estimates we analyzed their distributions for two groups of dairy farms — subsidized or non-subsidized. 2004 year was chosen as the reference year for grouping since it might be expected that farms receiving subsidies in t_1 period invest them in better inputs, new technologies thus improving their efficiency and technology indicators in period t_2 .

To quantify the impact of subsidies on efficiency and technology measures we estimated the probability of positive change in efficiency and production technology measures due to subsidies. The dependent variable is a qualitative (dummy) variable that takes the value of one if a dairy farm experienced positive change in corresponding efficiency or technology measure and zero otherwise. Three explanatory variables were chosen: i) percentage of subsidies in total production costs, so it takes values from zero to one; ii) herd size measures the size of the dairy farm; iii) herd size squared might indicate non-linear impact of herd size on dependant variable.

Production Subsidies provided to Ukrainian dairy farms: description and profile

According to the State Statistics Committee, Ukraine annually produces about 14 m tons of raw milk. More than 60% of this amount is produced in households and the rest is on farms. About half of the total raw milk supply is processed by the dairy industry being one of the most dynamically developing sectors in Ukraine’s food processing sector. So dairy farming and dairy processing is seen as one of the most perspective sectors in Ukraine and perceived as very attractive by investors (see Figures 12.1 and 12.2).

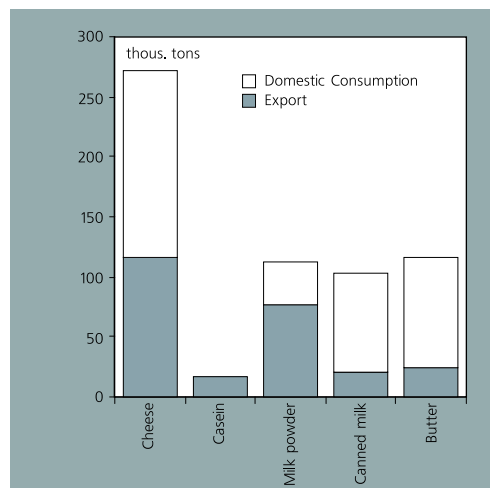


Figure 12.1
Dairy Production/Export ratio in 2005
 Source: State Statistic Committee of Ukraine.

In the analysis the farm level data of two types of subsidies are used. The first and the biggest subsidy element comes from value added taxes (VAT) collected from the dairy processing industry. VAT received by dairy processing enterprises from selling dairy products is retained on a special account and paid to agricultural producers selling their unprocessed milk to processing enterprises based

on the quantity of milk delivered. The second subsidy element is a premium for milk of certain quality sold to dairy processors. So in the analysis we deal with coupled subsidies, since they “coupled” to specific commodity.

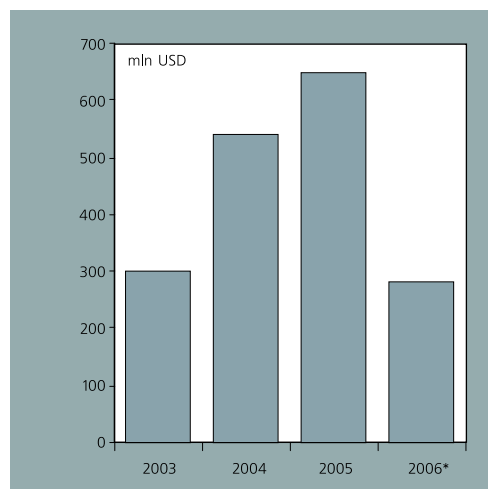


Figure 12.2
*Dairy Export from Ukraine**
 Source: State Statistic Committee of Ukraine.
 * In 2006 a shortfall of Ukrainian dairy export volume occurred since Russia banned import of Ukrainian livestock products.

Figure 12.3 provides information on the profile of subsidies granted to dairy farms of Ukraine, informing about the distribution of subsidies received per head and per kilogram of milk. To account for the scale of dairy production we grouped dairy farms’ subsidies using International Farm Comparison Network (IFCN)¹⁹¹ grouping. As Figure 12.3 clearly shows the size of the dairy farm is an important factor to receive subsidies from the state. The comparisons of heights of distributions or probability mass in “0” value region on all four diagrams reveals this, reflecting the proportion of dairy farms receiving no subsidies. One may observe that groups of farms with lower herd size tend to have higher heights or more probability mass in close to “0” value region. For example, farms with more than 300 cows have the lowest heights against zero value, revealing that this group has the lowest proportion of farms receiving no subsidies.

The shape of distributions gives us further important information. Groups with lower herd size tend to receive less subsidies per head and per kilogram of milk. Thicker tails of subsidies per head distributions reveal this. However, one may claim that larger farms may have better productivity indicators (e.g. higher yields) compared to smaller farms. And since subsidies per output are considered in this paper it would be natural to expect more subsidies per head for larger farms. On the other hand the distributions of subsidies per kg help to overcome the above stated concern. As it is seen from the lower two diagrams in Fig-

¹⁹¹ See Hemme et al. (2003).

ure 1, the modes of distributions move rightwards as farms with larger herd size are considered. That means that the majority of farms with larger herd size receive more subsidies per kilogram.

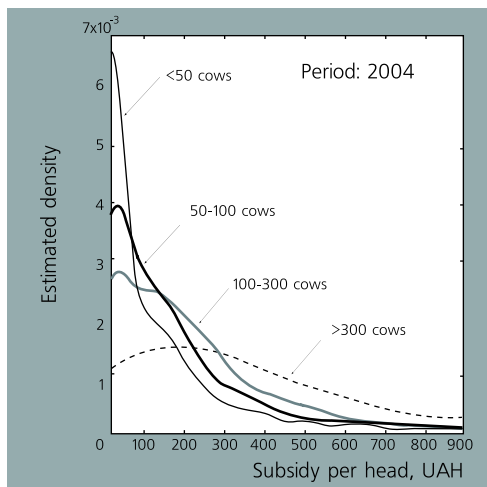
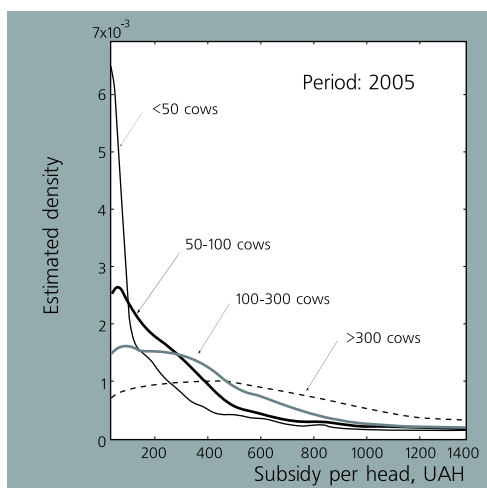
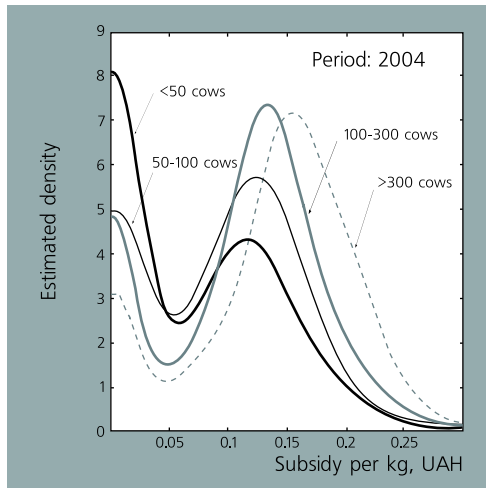


Figure 12.3 (1—4)
The Profile of Subsidies granted to the dairy farms in Ukraine
 Source: Own calculations and presentation

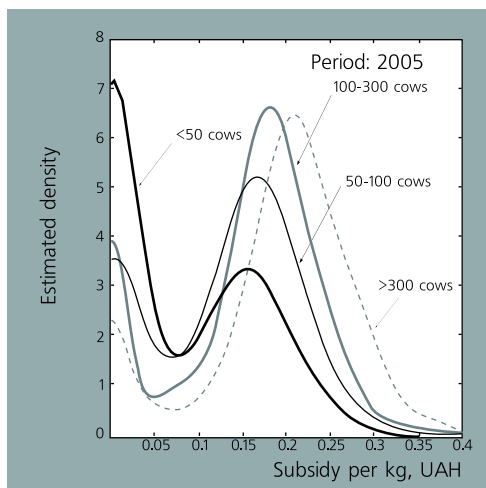
(1)



(2)



(3)



(4)

Additional information contained in the Table 12.2 confirms the conclusions received from Figure 12.3. Table 12.2 shows that for each year groups with lower herd size have less subsidized farms. Another observation is that as one moves from lesser herd size group to bigger ones, the contribution to the dairy sector supply relative to the share of subsidies received decreases (see Ratio 5 in the Table 12.2). For example, in 2004 the group of farms with more than 300 cows produced 56.3% of the total production volume but received about 75% of the total subsidies volume.

Table 12.2
Additional information on the dairy subsidies' profile

Herd size, cows	2004					2005				
	Subsidised to Total farms ratio, %	Weight of group in total number of farms, %	Weight of group in total production volume, %	Weight of group in total subsidies volume, %	Ratio 3/ Ratio 4	Subsidised to Total farms ratio, %	Weight of group in total number of farms, %	Weight of group in total production volume, %	Weight of group in total subsidies volume, %	Ratio 3/ Ratio 4
	Ratio 1	Ratio 2	Ratio 3	Ratio 4	Ratio 5	Ratio 1	Ratio 2	Ratio 3	Ratio 4	Ratio 5
<50	55.4	20.9	2.6	1	2.6	50.9	25.6	2.8	1.4	2.0
50-100	72.7	21.1	6.8	3.4	2.0	75.2	21.3	6.8	4.6	1.5
100-300	82.2	40.5	34.3	20.7	1.7	85.1	37.5	34.2	29.4	1.2
>300	89.5	17.5	56.3	74.8	0.8	91.3	14.7	56.2	64.7	0.9

Source: Own calculations.

The Impact of Subsidies on Efficiency and Technology of Production

DEA analysis showed that the majority of dairy farms in Ukraine produce milk at the efficiency levels¹⁹² in the vicinities of 1.4 (or 71%)¹⁹³ and 1.3 (or 76%) scores in 2004 and 2005 respectively. So it is evident that domestic dairy farms underutilise their potential, or use resources at hand inefficiently showing a huge potential for improvement.

¹⁹² Here we mean TEO scores under VRS assumption, or pure technical efficiency

¹⁹³ As it was mentioned in methodology description part efficiency score of a firm k can be represented in percentages, i.e. $(1/TE'_0(x^k, y^k)) * 100\%$.

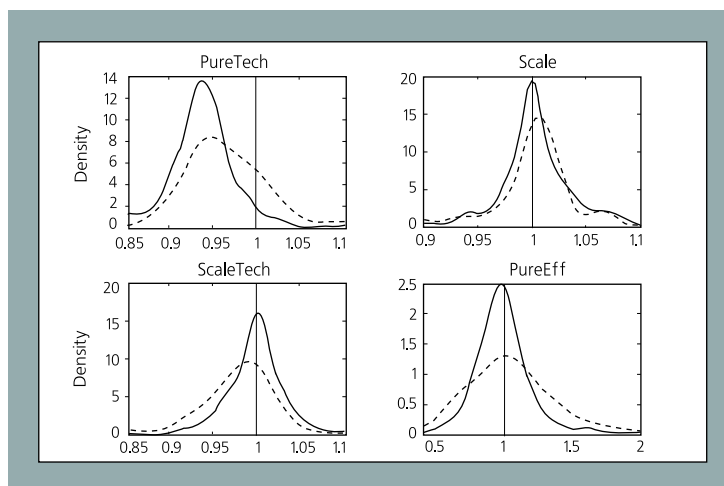


Figure 12.4

Kernel Estimated Densities of Efficiency and Technology Change Measures for subsidised and non-subsidised dairy farms

Source: Own calculations. Notes: PureTech — pure technical change; Scale — scale efficiency change; ScaleTech - change in the scale of technology; PureEff — pure efficiency change; solid line — subsidized dairy farms; dashed line — non-subsidized dairy farms.

Figure 12.4 demonstrates distributions of Malmquist productivity index components for groups of subsidized and non-subsidized dairy farms. One may notice a slightly better performance of non-subsidized farms vis-à-vis subsidized. For instance, in the upper-left diagram Pure Technology Change scores indicate that majority of dairy farms in both groups experienced negative change (deterioration) of production technology. However, for the non-subsidized dairy farms this change was notably less. The same logic applies to Scale and Pure Efficiency Change scores, where modes of distributions for non-subsidized group of dairy farms are located to the right from corresponding subsidized group modes, indicating better performance of non-subsidized group of dairy farms. Recall that >1 indicates changing away from CRS. So, moving leftwards for the Scale Technical Change distribution is considered as a positive development. That is why bottom-left diagram shows that non-subsidized dairy farms tend to outperform their counterpart group in terms of improving the scale of technology to the optimal (CRS) scale level.

Probit analysis confirmed quantitatively observations presented in the previous paragraph. Annexed Tables showed statistically significant (except for scale efficiency change) negative impact of subsidies on the probability of positive change in corresponding efficiency and technology measures, controlling for farm size. The marginal effects or elasticity indicate the strength of the correla-

tion between the probability of positive change in corresponding efficiency and technology measures and a respective explanatory variable, holding all other explanatory variables at their means. For instance, the increase of percentage of subsidies in the total production costs by 1 % decreases the probability of positive pure efficiency change by 0.3%, of pure technical change by 0.03% and of scale technical change by 0.3%.

Additionally we looked at whether the dairy farm size has the impact on efficiency and technology change measures, since farm size is expected to influence properties of dairy farm technology. Annexed Tables demonstrate statistically significant (except for pure efficiency change) non-linear impact of herd size on efficiency and technology change measures. For example, every additional cow in a herd tend to decrease the probability of positive pure technical change, scale technical change and scale change by 0.01%, 0.2% and 0.03% respectively. The impact continues to be negative down to a turning point of 1095, 570 and 880 cows respectively and than it becomes positive. Thus we received empirical evidence that mega dairy farms have greater potential to improve the dairy farms technology or its properties, while no significant impact of the herd size was noticed on "pure" technical efficiency, which is consistent with Leibenstein (1966) hypothesis.

Further additional observation is that subsidies and their amount tend to stabilize efficiency and technology measures scores on a certain level. For instance, one may notice that the variance of efficiency and technology change scores distributions looks smaller for the subsidized group of dairy farms on all four diagrams in Figure 12.4. At least it is apparent for the pure technical and pure efficiency changes. Moreover annexed figures show that bigger percentage of subsidies in total production costs is associated with less dispersion of efficiency and technology change data around the trend line. Especially it is clearly observed for pure efficiency change data. One may think of the found stabilization property of subsidies as an obstacle for the structural changes in a sector. Despite the attractiveness of stabilization as such (e.g. price stabilization, investment climate stabilization etc), stabilization of efficiency or technology is seen to be harmful for the sector since in our case this means lack of incentives to adopt new technologies of production (positive pure technical change), lack of incentives to work more efficiently (positive pure efficiency change) etc. In turn, these have negative consequence for the farm dairy sector (low quality of milk, seasonality of raw milk supply, higher production costs) and for the upstream dairy industry competitiveness. So in all probability stabilization of efficiency and technology change indicators cannot be considered as a policy goal if dairy sector would like to restructure in competitive on a world markets sector.

Conclusions

In this paper the impact of production subsidies on efficiency and technology measures based on Ukrainian dairy farms case is investigated. Applying econometric analysis this study employed two farm level panel datasets on input-output and subsidies information provided by the State Statistics Committee of Ukraine. The first sample (sample 1) was employed to provide the complete picture on the dairy sector subsidies profile containing 9610 observations from 4805 farms annually over the period 2004-2005. The second sample (sample 2) consists of specialized farms and contains 1375 observations from 689 and 686 farms over the period 2004-2005 respectively. Sample 2 was derived from Sample 1 and used for efficiency and technology change measures estimation using DEA. Also, kernel-based estimate of unknown univariate density function with Gaussian density kernel function allowed investigating the distribution of variables under consideration.

Empirical results of the analysis lead to the following conclusions:

1) Subsidies to dairy farms of Ukraine are not evenly distributed. It is found that farms with lower herd size tend to have less access to subsidy funds. Moreover, farms with lower herd size tend to receive fewer subsidies per head and per kilogram of milk. Politically, this cannot be justified. Access to subsidies that the Government grants is obviously not equal to all dairy farms.

2) It is observed a negative relationship between subsidies, efficiency and technology measures. It looks like subsidies limit the ability of dairy farms to adjust their behavior and operate more efficiently, as well as to employ more advanced technologies or improve properties of the existing technologies. It was estimated that increase of the percentage of subsidies in the total production costs by 1 % decreases the probability of positive pure efficiency change by 0.3%, of pure technical change by 0.03% and of scale technical change by 0.3%.

3) Additional analyzed variable, which is expected to influence efficiency, technology, and its property measures, is dairy farm size. We found non-linear, consistent with expectations, impact on dairy farms technology and its property change measures. This observation justifies mega farms (500-1000 cows herd size) to be the major driving force for driving sector technology and its properties up, thus improving overall sector's competitive position. However, no significant impact of the herd size was noticed on "pure" technical efficiency.

4) Subsidies show stabilizing effects. The empirical evidence shows that subsidized dairy farms have less dispersed efficiency and technology change measures data. However, in our case stabilization of efficiency or technology is seen to be an obstacle for the structural changes in the sector, meaning lack of incentives to adopt new technologies of production and to work more efficiently. Thus in

all probability stabilization of efficiency and technology change indicators cannot be considered as a policy goal if dairy sector would like to restructure in competitive on a world markets sector.

All these four conclusions have to discourage Ukrainian policy makers from continuing the subsidy program considered in the paper, if their objective is to have a strong and competitive on the world markets dairy sector in Ukraine.

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Appendix A

Table A 12.1

Probit regression estimates

	Pure Efficiency Change		Pure Technical Change		Scale Technical Change		Scale Change	
	dF/dx (elasticity)	Coeff's	dF/dx (elasticity)	Coeff's	dF/dx (elasticity)	Coeff's	dF/dx (elasticity)	Coeff's
Percentage of subsidies in total production costs**	-0.318	-0.8091 (0.04)	-0.02967	-2.2681 (0.02)	-0.3152	-0.8398 (0.04)	-0.2019	-0.51099 (0.19)
Heard Size*	0.0002	0.0005 (0.366)	-0.00013	-0.0101 (0.00)	-0.0024	-0.0065 (0.00)	-0.0003	-0.0009 (0.01)
Heard Size Squared*	-2.33E-07	-5.91E-07 (0.23)	6.04E-08	4.62E-06 (0.00)	2.13E-06	5.67E-06 (0.00)	2.04E-07	5.17E-07 (0.02)
const		-0.0749 (0.49)		0.1651 (0.35)		1.5494 (0.00)		0.4185562 (0.00)
Number of obs	670							
Log likelihood	-455.217		-109.26585		-390.68237		-455.275	
LR chi2(3)	7.83		134.81		125.84		10.52	
Prob > chi2	0.0498		0		0		0.0147	
Pseudo R2	0.0085		0.3815		0.1387		0.0114	

Source: Own calculations. Notes: p-values are given in brackets.

Appendix B

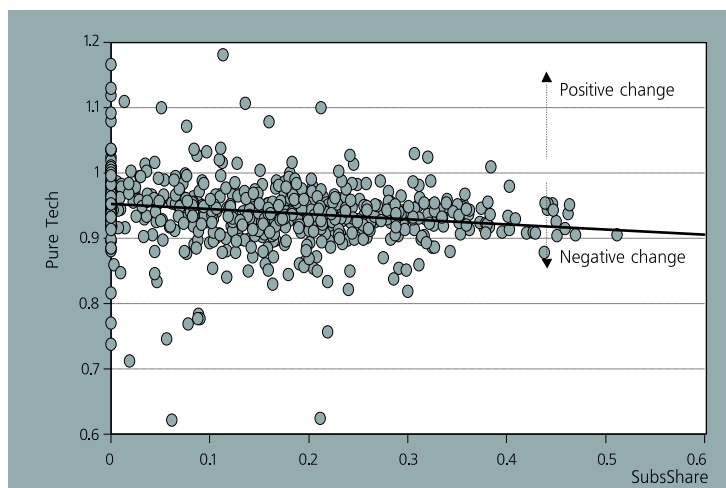


Figure B 12.1
Pure technological change and the percentage of subsidies in total production costs

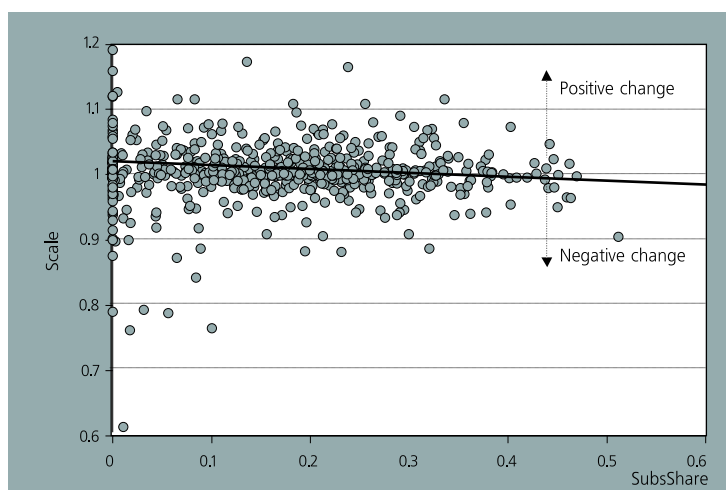


Figure B 12.2
Pure scale efficiency change and the percentage of subsidies in total production costs

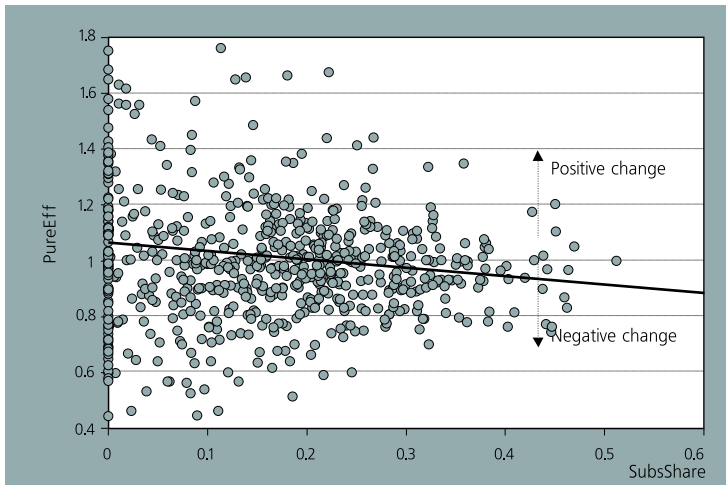


Figure B 12.3
Change in the scale of technology and the percentage of subsidies in total production costs

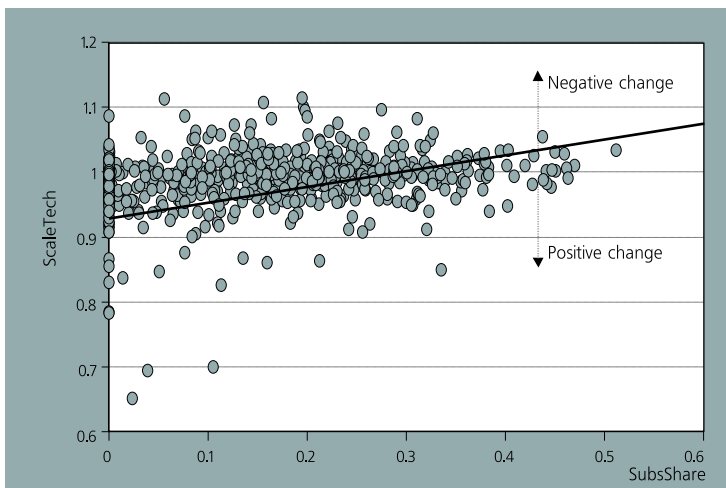


Figure B 12.4
Pure efficiency change and the percentage of subsidies in total production costs

13. Regulatory Needs for Genetically Modified Organisms

This paper produced in summer 2007 was aimed at the analysis of the Law of Ukraine "On the State Biosafety System for Developing, Testing, Transportation and Usage of Genetically Modified Organisms" passed by the Verkhovna Rada in May 2007. The Law is expected to bring a new quality into the relevant Ukrainian legislation as it is the first legal act in Ukraine that provides for a systematic approach in GMO handling. This study starts with an overview of the GMO-related situation in Ukraine before the adoption of the Law on GMOs, continues with the presentation and assessment of the mechanisms introduced by the Law and ends with recommendations on its improvement. Particular attention is paid to such issues as implementation procedures, labeling, risk assessment, and control mechanisms.

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Introduction

According to the report of the USDA Foreign Agricultural Service,¹⁹⁴ Ukraine imported products valued at USD 39 million in 2005 that could contain GMOs, including soybean meal, soy sauce and soybeans. In 2006, these products accounted for almost USD 62 million. In this situation, it is of vital importance for Ukraine to develop a comprehensive set of legislative and organizational norms regarding GMOs to ensure their safe use. From human health perspective, it is necessary to have regulations in place that would allow on the market only these GMOs and products derived therefrom that successfully underwent safety testing and registration. For environmental safety it is necessary that measures to ensure coexistence are taken to avoid crossing of GMO plants with conventional ones. Finally, clear regulations on importation, sale and labeling of GMOs and products derived therefrom would create predictable sales conditions for interested importers and traders.

Until now, Ukraine was lacking a legal act that would provide for a systematic approach in GMO handling. Provisions related to biotechnology were scattered in several different laws (e.g. the Law on Quality and Safety of Food Products,¹⁹⁵ the President's Decree on the Interdepartmental Commission on Biological and Genetic Safety under the Council of National Safety and Defense¹⁹⁶). Mandatory labeling of GMO food is required by article 15 of the Law on Consumer Rights Protection.¹⁹⁷ But this labeling provision is unclear on threshold and for this reason difficult to enforce. The Ukrainian biosafety system was launched in 1999 solely for genetically modified plants.¹⁹⁸ Even the ratification by Ukraine of the UN Cartagena Protocol on Biosafety in 2002 did not result in the development of a biotechnology regulatory system.

In 2002, this legislative vacuum was addressed by the draft law "On the State Biosafety System for Developing, Testing and Usage of Genetically Modified Organisms". It was passed in the first reading by the Verkhovna Rada already in November 2002. Since then, the draft was pending final approval by the Parliament. Quite unexpectedly, on May 30, 2007, it was replaced by the draft law "On the State Biosafety System for Developing, Testing, Transportation and Usage of Ge-

¹⁹⁴ Olena Pereyatenets "Ukraine Agricultural Biotechnology Report" 2007.

¹⁹⁵ Law No 771/97 of 12 December 1997.

¹⁹⁶ Decree No 672/2004 of 23 June 2004.

¹⁹⁷ Law No 1023—12 of 12 Mai 1991.

¹⁹⁸ Resolution of the Cabinet of Ministers "On Provisional Order for Importation, State Testing, Registration and Usage of Transgenetic Plants" No 1304 of 17 August 1998; under this resolution no biotech crop has ever been registered for cultivation in Ukraine (in total, five applications were received in 1997 — 1999). According to this resolution, import of biotech crops requires a mandatory permission of the Ministry of Agricultural Policy.

netically Modified Organisms”,¹⁹⁹ passed by the Verkhovna Rada under a priority procedure on the following day. The draft law was submitted by the Cabinet of Ministers, together with nine other laws required for Ukraine’s WTO accession passed on that day.

The Law “On the State Biosafety System for Developing, Testing, Transportation and Usage of Genetically Modified Organisms” entered into force on the day of its publication on June 21, 2007. Its adoption fills the dangerous legislative vacuum, and is an important step towards the development and implementation of a comprehensive regulatory framework on commercial use of genetic modification in Ukraine.

It is important to note that there was no public debate over this draft law. Despite the fact that the issue of GMOs in seeds, crops and food is a very controversial one, the environmental NGOs, consumers’ associations and other potentially interested stakeholders had no opportunity to provide comments and suggestions on the draft law to the responsible parliamentary committees.

The aim of this paper is to give a comment on the above Law on GMOs. Its positive aspects — as regards food and environmental safety — will be discussed and the aspects that require further improvement pointed out. The analysis is made in a wider context of the gradual approximation of Ukrainian legislation to European Union law.

It should be noted that the European Union has the strictest code of laws governing GMOs in the world, reflecting the serious reservations that many countries still have, from both health and environmental perspectives. The EU allows the use of genetic engineering in agriculture and food production but, at the same time, sets tight safety standards to protect consumer health and environment.

Content of the Law on GMOs in brief

According to article 5 of the Law on GMOs, following activities fall within its scope:

- genetic engineering activities in the closed environment;
- genetic engineering activities in the open environment;
- state registration of GMOs and products produced using GMOs (further — GMO products);
- putting into circulation of GMOs and GMO products;
- export, import and transit of GMOs.

¹⁹⁹ Draft law No 3595 of 30 May 2007.

The Law introduces following instruments:

- ✓ mandatory state registration of GMOs and GMO products, including plant protection agents produced using GMOs and GMO-based crop varieties and animal breeds; a time limit of 120 days for granting or refusing registration; first registration to be limited to a maximum of 5 years and may be renewed (article 14);
- ✓ release of GMOs into the environment as well as production, putting into circulation and import of GMOs and GMO products is prohibited until they are state registered under the Law on GMOs. There are two exemptions in place: 1) import of non-registered GMOs and GMO products for the purposes of study, research and testing and 2) releasing of GMOs into the environment for the purpose of testing (article 16 and 13 respectively);
- ✓ mandatory permission for 1) import of non-registered GMOs for the purposes of study, research and testing, 2) import of GMO products for the purposes of study and research, 3) transit through Ukraine of non-registered GMOs as well as for 4) release of GMOs into the open environment; a time limit of 45 days for granting or refusing permission (article 19);
- ✓ mandatory licensing of genetic engineering activities carried out in the closed environment (article 12) and in the open environment (article 7);
- ✓ environmental risk inspections of GMOs to be carried out by the Central Executive Authority of Environment and Natural Resources (article 9);
- ✓ sanitary and epidemiological inspections of GMOs and GMO products to be carried out by the Central Executive Authority of Health Care (article 10);
- ✓ monitoring of GMO food products as well as feed products to ensure that only registered GMO sources are used — to be carried out by the Central Executive Authority of Health Care and Central Executive Authority of Agricultural Policy respectively (article 10 and 11);
- ✓ the possibility of establishing GMO free zones as well as mandatory space between fields with conventional and GMO plants in case of cultivation (article 14);
- ✓ mandatory information on GMO usage to the public (article 20);
- ✓ the possibility of the competent authority to reject the registration of GMOs or GMO products if sound scientific information proves that their designated use brings hazard to human health or the environment (article 14).

Assessment of the Law

As can be seen above, the Law on GMOs introduces several important mechanisms as regards GMO handling in Ukraine. Some of them, like monitoring of GMO

products, have been introduced in Ukraine for the first time, the others, like registration, were available until now only for biotech plants. Monitoring of GMO products is of special importance as it allows to control the GMO products after their putting into circulation.

Also important, the Law provides a framework for further measures. It foresees, amongst others, the approval of the safety criteria for GMO handling, the procedure for licensing genetic engineering activities in closed and open environments and the procedure for granting permission for the transit of GMO through Ukraine.

The Law on GMOs is not a large document, particularly when bearing in mind that EU legislation in this area is made up of several different regulations and directives.²⁰⁰ At the same time, it covers a wide range of GMO related issues from the registration of GMO-based crop varieties to activities related to GMO products. As a consequence, it is in some aspects rather general and would need secondary legislation. The most striking example is storage of GMOs, which is addressed by one general sentence only (see article 17). Likewise underregulated is the issue of transportation and recycling of GMOs. Additionally, some mechanisms introduced by this Law to ensure biosafety need specification, above all the procedure for state registration, which is at the heart of the system. These issues will have to be covered by secondary legislation.

The analysis of the objectives of the Law on GMOs gives information on the intended Ukrainian policy regarding commercial use of GMOs in the nearest future. Article 3 of the Law provides that its objective is to ensure conditions for a safe usage of GMOs. According to this article, protection of human health and the environment has priority over possible economic advantages of GMOs. On the other hand, the Law foresees state support both to genetic engineering and to research in the area of biological and genetic safety in the developing, study and practical usage of GMOs. It means that Ukraine intends firmly to benefit from GMO technology. As a result, we can expect increased scientific research in this field.

A very positive feature of the Law on GMOs is that it introduces mandatory information on GMO usage to the public. Its article 20 ensures availability of this information to the public, which is in line with EU laws. Additionally, according to article 14 of the Law, the registers of GMOs and GMO products shall be published on the Internet website of the responsible central authority and in media. Only confidential data under Ukrainian legislation can be kept secret, but the

²⁰⁰ Directive 2001/18/EC on the deliberate release into the environment of GMOs; Regulation (EC) No 1829/2993 on genetically modified food and feed; Directive 90/219/EEC as amended by Directive 98/81/EC on the contained use of genetically modified microorganisms; Regulation (EC) No 1946/2003 on transboundary movements of GMOs; Regulation (EC) No 1830/2003 concerning the traceability and labelling of GMOs and the traceability of food and feed products produced from GMOs, and some other instruments that have been adopted in connection with this legislation.

Law states clearly that information on effects of the GMO on human health and on the environment can in no case be considered confidential.

However, EU legislation goes a step further — the public in the EU should be consulted during the process of granting authorization for the proposed GMO release into environment. At present, due to the lack of the relevant secondary legislation, it is impossible to say whether Ukraine will follow the EU in this regard.

The major weakness of the Ukrainian Law on GMOs is that it does not introduce a single control agency that would take on responsibility for ensuring the safe developing, testing, transportation and usage of GMOs. Instead of that, regulatory and control responsibilities are divided amongst five central bodies: the Cabinet of Ministers and the Central Executive Authorities of Education and Science, Environment and Natural Resources, Health Care, and Agricultural Policy. The authority of each body is specified in articles 7 — 11, and it is the Cabinet that coordinates the actions.

The Law does not introduce a requirement for labelling either. The relevant provisions are contained in the resolution²⁰¹ (postanova) of the Cabinet of Ministers of 1 August 2007, issued for the execution of the Laws on Consumer Rights Protection and on Children Foodstuff. It foresees mandatory labelling of foodstuff containing GMOs. According to the resolution, GMO content that is over the prescribed threshold — set at 0.9% — is subject to mandatory labelling. This particular provision aligns with EU norms, which also set the threshold at 0.9%. As a result, import into Ukraine and sale of food products containing more than 0.9% of GMO material will be only possible under the condition that they are properly labelled.²⁰² Additionally, the resolution introduces a ban on imports, production and sales of children foodstuff with GMOs.

Apart from the above, it is article 12 of the Law on GMOs that merits attention: according to it, each company seeking a license for carrying out genetic engineering activities in the closed environment should set up a commission, comprising of its employees, whose task would be to carry out the initial risk assessment. If Ukraine decides to follow EU legislation, this risk assessment will then be examined by a competent authority, and on this basis the decision of granting or refusing a license will be taken. In this case, law makers should clarify the methodology to be followed and elements to be considered to perform the risk assessments that would allow for their uniform carrying out by the companies. The Law on GMOs does not provide for such rules. In no case the risk assessment conducted by the interested company should be the sole basis for the final decision.

²⁰¹ Resolution No 985 of 1 August 2007.

²⁰² Resolution will come into force on November 1, 2007.

Conclusion

The adoption of the Law on GMOs was a first and absolutely necessary step in dealing with an important issue of food and environmental safety in both practical and legal terms. Still, the Law needs further improvement and development, and it is the relevant secondary legislation adopted on its basis that will determine the effectiveness of the system.

Based on the above analysis, we recommend to:

- ✓ adopt as soon as possible implementing regulations on the basis of the Law and for its execution to make the system workable. First, the registration procedure for GMOs and GMO products should be specified — as this procedure is a main instrument for ensuring biosafety in GMO handling — and system of control over the observance of safety rules in genetic engineering activities developed;
- ✓ establish a single control agency that would take on responsibility for ensuring the safe developing, testing, transportation and usage of GMOs to ensure transparency and avoid loopholes in the biosafety system that could result from split responsibilities;
- ✓ include provisions on labelling of GMO food products in the Law on GMOs as the laws have higher legal force than resolutions. It should be noted that the labelling of GMO products is a unique instrument for ensuring consumers the freedom of choice — choice between conventional and GMO products;
- ✓ establish a common methodology to conduct the risk assessment; it should take account of potential cumulative long-term effects associated with the interaction with other GMOs and the environment;
- ✓ involve the public in the decision making process regarding the intended GMO release; arrangements for such consultation, including a reasonable time period, should be laid down in order to give the public and interested groups/organisations the opportunity to voice their opinion.

And last but not least, special attention should be paid to ensuring the enforcement of the Law. At present, there are three laboratories in Ukraine where GMOs can be identified in food and other products that contain or may contain GMOs. It is crucial for Ukraine to set up more independent test centers engaged in estimation of GMO concentration. Without operational laboratories and keeping up with the newest technologies, it would be impossible to detect GMOs and thus to make the provisions of the Law enforceable.

Part IV: Bioenergy Policy issues and Options

14. Economic Assessment of Biofuels in Ukraine

This paper was requested by the Ministry of Agrarian Policy and prepared in 2007. It is aimed at analyzing the economics of biofuels production in Ukraine from a domestic and international perspective. To assess the potential competitiveness of biofuel production in Ukraine, in the first step investment costs have been calculated using data of actual recent European investments. Then, maximum bidding prices for grain and rape seed that potential Ukrainian investors would be willing to pay have been estimated and compared with actual market prices. The analysis showed that biofuels were not competitive during the analyzed period. Taking this result into account and analysing recent trends on international biofuel and energy markets, the paper concludes that although economic cost of biofuel production in Ukraine would be very high, the country could be one of the major beneficiaries of the world biofuel boom by exporting agricultural products.

The paper was written by a team of Ukrainian and German Experts from the Institute for Economic Research and Policy Consulting and private sector experts

Introduction

Biofuels are in vogue. High world energy prices, the dependency of many countries on energy imports and the increasing awareness of the effects of global warming have put them high on the agenda of policy makers in many countries of the world. Biofuels are already established with biodiesel used in the EU and ethanol in the USA and Brazil. Other countries in the world like Canada, Argentina, India, China, Malaysia, Indonesia and not least Ukraine, Russia and Kazakhstan are also interested in biofuels or have already developed support programs.

In Ukraine this development is spurred by the country's energy dependency on Russia. Gas import prices were increased substantially last year, and the closure of the Druzhba oil pipeline has reminded Ukraine and other countries again how dependent countries are on the energy-rich countries of the world. For many Ukrainian policy makers, the logical consequence is to pursue a biofuel policy and to use its vast agricultural land to produce much of its fuel needs from agricultural products in the form of biodiesel and bioethanol.

This paper will shed some light on the biofuel policy options Ukraine has and analyse how Ukraine can benefit from the biofuel boom in the world. Indeed, this boom is a huge opportunity for Ukraine's agriculture, agribusiness and for the economy as a whole. A well defined policy can contribute significantly to Ukraine's economic growth.

Unfortunately, biofuels are expensive to produce, and with one exception, that is bioethanol from sugar cane in Brazil, there is no country in the world where biofuels can compete with fossil fuels at current ratios of fossil energy and biofuels production costs. After providing an overview on biofuels, this is analysed in detail in chapter 3. Chapter 4 then focuses on the impact biofuels have on the world market for agricultural products, something Ukrainian farmers already feel due to higher prices. Based on this analysis, a number of policy options are discussed for Ukraine to define the best strategy on how Ukraine can benefit from the biofuel boom.

Biodiesel and Bioethanol Production — a Short Overview

Ethanol is an established fuel or fuel additive in Brazil, the US and to some extent also in the EU. Biodiesel is mainly produced in the EU, and production is increasing in the US, South America, South East Asia and Eastern Europe. Biodiesel and bioethanol are called First Generation biofuels. Second Generation biofuels comprise a number of new products and technologies. Among others are BTL (Biomass to Liquid), that is a fuel produced from wood or straw, or ethanol produced from celluloses. It has been shown that the production of second generation bio-

fuels is technically feasible, but the fuel is very expensive compared to fossil fuel and also compared to First Generation biofuels. Any market introduction is hardly possible in the next couple of years. Therefore, this study focuses solely on First Generation biofuels.

Biodiesel can be produced from any oil and fat by esterification. For this process the oil is mixed with methanol and a catalyst. This mixture is heated up in a reactor, and the outcome is biodiesel and glycerine. 1 t of oil plus 0.1 t of methanol produces approx. 1 t of biodiesel and 0.1 t of glycerine. The biodiesel properties and its quality depend on the production process, but even more important is the oil or fat used. It is the fatty acids of the fat that determine many of its properties, of which a very important one is the pour point of the biodiesel. This is the temperature at which the biodiesel solidifies. Biodiesel from rapeseed oil has the best properties, i.e. the lowest pure point, whereas soybean oil and especially palm oil have much higher pure points. This is the main reason why palm oil can only be used in the summer months for biodiesel production and even then only to a certain extent.

Bioethanol is produced from sugar via alcoholic fermentation, which produces ethanol and carbon dioxide (CO₂). Feedstocks that can be used for ethanol production are all sugars or products that can be fermented into sugar like starch from grain and potatoes or even celluloses. After the ethanol is produced, it needs to be purified and concentrated. This is done first in the distillation process, which produces a product with almost 95.6 % ethanol and 4.4 % water. After distillation ethanol can be further purified by "drying" it using lime or salt. Ethanol can be either anhydrous or hydrated. Anhydrous ethanol, that is ethanol with at most 1% water, can be blended with gasoline in varying quantities to reduce consumption of petroleum fuels, as well as reducing air pollution. In Brazil, ethanol-powered and flexible-fuel vehicles are manufactured to be capable of operation by burning hydrated ethanol that is 93 % ethanol and 7 % water. Ethanol is also used as an oxygenate additive for standard gasoline as ETBE (Ethyl-Tertiary-Butyl-Ether).

Table 14.1
Technical conversion factors of diesel, gasoline, biodiesel and bioethanol

	Diesel	Bodiesel	Gasoline	Bioethanol
Density in kg/l	0.84	0.88	0.74	0.79
Energy Content in Mega Joule (MJ/kg)	43.30	37.61	43.50	26.66
Energy Content in Mega Joule (MJ/l)	36.37	33.10	32.13	21.20
Energy Content as share of fossil fuels in l	100.0%	91.0%	100.0%	66.0%
Biofuel Yield per ha in l		1,547		2,500

Source: IEA, FNR.

The technical properties of bioethanol and biodiesel compared to fossil gasoline and diesel, respectively, are depicted in Table 14.1. For the further calculations the most important difference between fossil fuel and biofuel is the difference in specific weight and energy content, which for biodiesel is approx. 91 % of that for fossil diesel. The energy content of ethanol is approx. 66 to 67% of that for gasoline. These parameters are subject to some variation for both, fossil fuels and biofuels. But the average figures in Table 14.1 provide a pragmatic basis for further calculations.

The competitiveness of biofuels

It is directly at the pump where biofuels compete with fossil fuels. Car drivers decide whether to use biodiesel and ethanol or blends of it instead of pure diesel and gasoline. In the EU, the US and Brazil a number of government policies promote the use of biofuels through tax exemptions, mandatory blending regulations, among other measures. Thus, the true costs of biofuels are hidden. However, it is worth looking into the true cost of biofuels net of any government subsidy, to reveal the competitiveness of biofuels and to calculate the extent to which biofuels need to be subsidised to make them an option for the car driver.

How Crude Oil Prices and Diesel and Gasoline prices are connected

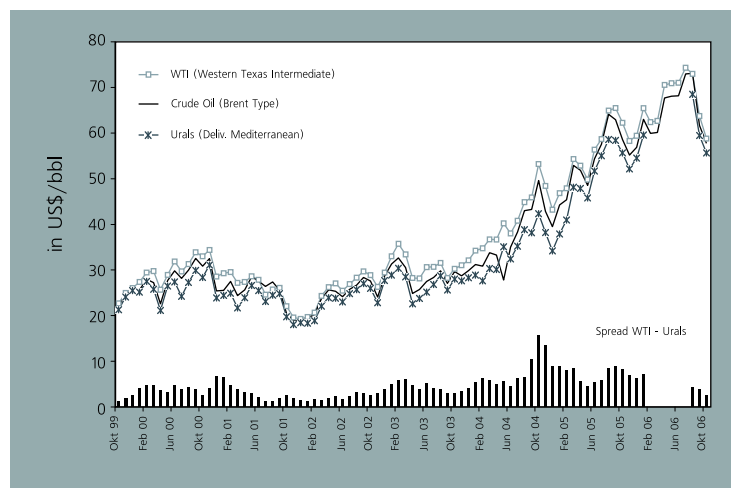


Figure 14.1
Crude oil price development since October 1999
 Note: Data are lacking for February to July 2006.
 Source: International Energy Agency (IEA), Oil Market Report (<http://www.oilmarketreport.org/>) various issues.

Internationally, oil prices are quoted in US\$ per barrel (US\$/bbl). The oil price

development since October 1999 is depicted in Figure 14.1 for different types of crude oil. The Western Texas Intermediate (WTI) is used as a benchmark for oil pricing, but also the North Sea Brent Crude, which forms the benchmark for crude oil prices in Western Europe, whereas Urals is the quality produced from Russia and other CIS states. The prices of these different types of oil are closely interrelated, although they can deviate from each other, especially when prices are highly volatile, which was the case in the last three years. Since 2003 crude oil prices increased substantially and reached their high at around 78 US\$/bbl in July and August 2006. Since then, they have dropped substantially to 60 US\$/bbl at the turn of the year 2006 to 2007.

As biodiesel and bioethanol compete with diesel and gasoline, the price relationship between crude oil on the one hand, and gasoline and diesel on the other is of major importance. This is shown in Figure 14.2 for crude oil (Brent type), diesel and gasoline (Rotterdam barges FOB). The major determinant of the gasoline and diesel price is, of course, the crude oil price.²⁰³ Other factors are the capacity use in the refining industry and the market situation of both products. In the EU, for example, the number of diesel cars and thus diesel use is increasing, whereas gasoline use is decreasing. In fact, the EU is a net exporter of gasoline, and this is why the price relationship of diesel compared to gasoline has widened.

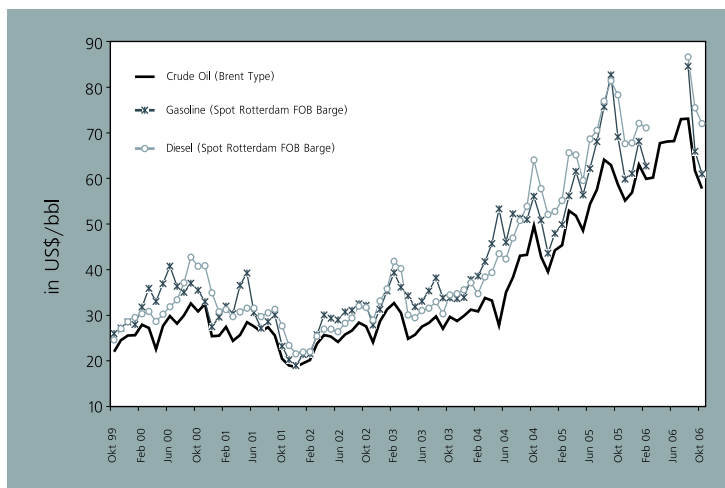


Figure 14.2
Crude oil prices and the impact on diesel and gasoline prices since October 1999

Note: Data are lacking for February to July 2006.

Source: International Energy Agency (IEA), Oil Market Report (<http://www.oilmarketreport.org/>) various issues.

²⁰³ Statistically, the correlation of the crude oil and the diesel price is 0.98 and 0.93 for crude oil and gasoline. This points to a very close correlation between the crude oil price and the diesel and gasoline prices, respectively.

Calculating a long term average for the period from October 1999 to January 2006, the price of gasoline in Rotterdam is approx. 1.20 times the price of crude oil, whereas the price relationship for diesel compared to crude oil is 1.21. However, for this study a price relationship of 1.3 will be used, as the domestic prices can deviate from the Rotterdam crude oil price quite substantially, mainly due to additional logistic costs.

Biodiesel

There is no straight answer to the question whether biodiesel is competitive to fossil diesel or not. In fact, it depends on a number of factors, with the most important one being the price of crude oil and fossil diesel. This is why the following calculations are based on these prices. The starting point is the crude oil price, which is assumed to be 60 US\$/bbl (compare to row (a) in Table 14.2), which is approx. 10 to 20 % above the current market prices. This crude oil price results in a net diesel price of 78 US\$/bbl, i.e. 1.3 times the crude oil price (b), which is equal to 491 US\$/m³ (c). As stated above, biodiesel has a lower energy content of approx. 91 % of fossil diesel. Thus, the maximum price of biodiesel that competes with fossil diesel is 446 US\$/m³(d). As the specific weight of biodiesel is 0.88 t/m³, this result is equal to a price of 507 US\$/t (e).

Table 14.2

The cost structure of biodiesel production in Ukraine and the calculation of the maximum bidding price for rapeseed oil and rapeseed

1.	Calculation of the max. bidding price of rapeoil	Calculation	
a	Price of crude oil in US\$/bbl	\$60	
b	Price of diesel in US\$/bbl	$\$78 = a * 1.3$	
c	Price of diesel in US\$/m³	$\\$491 = b/0.1589873$	
d	Maximum price of biodiesel in US\$/m³	$\\$446 = c * 0.91$	
e	Maximum price of biodiesel in US\$/t	$\\$507 = d/0.88$	
f	Production Cost		
g	Fixed capital cost in US\$/t	\$20	
h	Cost of methanol in US\$/t of biodiesel	$\$60 = 10 \% * P_{\text{methanol}}$	
i	Other costs (labour, energy) in US\$/t	\$20	
j	Loss due to cleaning in US\$/t	\$51 % of volume	
k	Cost of cleaning in US\$/t	\$22	
l	Margin of Biodieselproducer in US\$/t	\$20	
m	Total production cost in US\$/t	$\\$147 = g+h+i+j+k+l$	
n	Glycerin credit in US\$/t	$\$12 = 10 \% * P_{\text{Glycerin}}$ US\$/t	
o	Freight in US\$/t	\$25	
q	Maximum bidding price for rapeoil	$\\$347 = e-m+n-o$	
	Calculation of the max. bidding price of rapeseed		
r	Price of rapeseed oil EXW in US\$/t	\$347	
s	of rapeseed oil EXW in US\$/t	$\$146 = 42 \% * r$	
t	of rapeseed meal EXW in US\$/t	$\$92 = 57.5 \% * P_{\text{Rapemeal}}$	
u	Total value of crush products in US\$/t	$\\$238 = s + t$	
v	Crushing Cost in US\$/t	\$40in US\$/t of rapeseed	
w	Max. bidding price for rapeseed at mill in US\$/t	$\\$198 = u - v$	
3.	Prices and assumed parameters	Assumed Parameters	
	Price of methanol in US\$/t	\$600.00 Yield of Rapeoil per t of rapeseed	42%
	Price of glycerin in US\$/t	\$120.00 Yield of Rapemeal per t of rapeseed	58%
	Price of rapeseed Meal in US\$/t	\$160.00 Liter per barrel	158.99
	Investment for a plant	\$30,000,000 Specific weight of rapeoil in m ³ /t	0.91
	Yearly capacity in t	200,000 Specific weight of biodiesel in m ³ /t	0.88
	Interest rate in %	6.00%	
	Depreciation in years	10	

Source: International Energy Agency (IEA); Oilworld; own calculations.

The total production costs are assumed to amount to 147 US\$/m³ (m), including capital cost (depreciation and interest rate), the cost of methanol and other costs like labour, energy etc. As glycerine is a second product of the biodiesel production process, its revenue needs to be deducted from the production cost. Transport costs from the rapeseed crushing plant to the biodiesel producers are also assumed. These transport costs do not occur for biodiesel producers with an integrated crushing plant. This is how the maximum bidding price for rapeseed oil is calculated, in the example in Table 14.2 it amounts to 347 US\$/t (q).²⁰⁴

The last step is to calculate the price for rapeseed. The revenue of any oilseed crushing plant depends on the price of the oil and the price of the meal, weighed by the share of each product. In this example, an oil yield of 42 % is assumed and a corresponding rapeseed meal yield of 58 %. This cost structure applies to a crushing plant with extraction technology. A crushing plant without extraction shows a much lower oil share of 30 to 35 %, and it produces rapeseed expeller meal with a much higher oil share of approx. 10 % or even more. Assuming a rapeseed oil price of 347 US\$/t (r), a rapeseed meal price of 160 US\$/t and crushing costs of 40 US\$/t (v) of rapeseed, the maximum bidding price for rapeseed is 198 US\$/t (w). It is clear that this price is well below the market price farmers can get for rapeseed currently in Ukraine. Thus, any biodiesel producer would hardly be competitive without subsidies.

Table 14.3

The maximum bidding price for rapeseed at different crude oil prices and rapeseed meal prices

		Crude oil price in US\$/bbl							
		\$40	\$50	\$60	\$70	\$80	\$90	\$100	\$110
Rapeseed meal price in US\$/T	\$80	\$81	\$116	\$152	\$187	\$223	\$258	\$294	\$329
	\$100	\$92	\$128	\$163	\$199	\$234	\$270	\$305	\$341
	\$120	\$104	\$139	\$175	\$210	\$246	\$281	\$317	\$352
	\$140	\$115	\$151	\$186	\$222	\$257	\$293	\$328	\$364
	\$160	\$127	\$162	\$198	\$233	\$269	\$304	\$340	\$375
	\$180	\$138	\$174	\$209	\$245	\$280	\$316	\$351	\$387

Source: own calculations.

²⁰⁴ The capital costs or fixed cost are, of course, not relevant in the short run. A biodiesel producer would produce even if the capital costs were not covered fully. However, as they account for only one quarter of the total cost, this is not very relevant for the whole calculation.

This calculation is just an example and the result depends on a number of factors, of which some are more and others less important. As already stated, the factor with the largest impact is the crude oil price. The second most important factor is the price of rapeseed meal, which accounts for a significant share of revenue of a crushing plant. This is accounted for in Table 14.3, where the maximum bidding price for rapeseed — using the calculation in Table 14.2 — is calculated at different crude oil prices and rapeseed meal prices. This price is the maximum price a biodiesel producer can pay for rapeseed (or rapeseed oil) at a given crude oil price and rapeseed meal price without running a loss. As an example, the highlighted figure assumes a crude oil price of 60 US\$/bbl and a rapeseed meal price of 160 US\$/t resulting in a maximum bidding price of 198 US\$/t — exactly the figure from Table 14.2, where the same figures are assumed. The maximum bidding price for rapeseed varies from 81 US\$/t at a crude oil price of 40 US\$/bbl and a rapeseed meal price of 80 US\$/t to 387 US\$/t, when the crude oil price is at 110 US\$/bbl and the rapeseed meal price at 180 US\$/t.

Other factors having an impact on the above calculations are:

- ✓ The relationship between the crude oil price and the diesel price. The factor used here is 1.3, which is higher than the relationship calculated using figures from the International Energy Agency. A higher ratio results in higher maximum bidding prices.
- ✓ The production cost of biodiesel. Smaller plants are more expensive than larger plants and plants with an integrated crush tend to have lower transport costs. Furthermore, the price of methanol has a certain impact as well as the price for glycerine. Some years ago the prices for glycerine on the world markets were as high as 900 US\$/t, but due to the ever increasing production of biodiesel the prices have dropped dramatically, sometimes to well below 50 US\$/t depending on the quality. Thus, whereas glycerine provided a good share of the margin some years ago biodiesel producers now need to find new ways to market the product.

Bioethanol

The cost structure of bioethanol production is depicted in Table 14.4. Again, the true cost of any plant can deviate quite substantially from the figures provided here, depending on the plant type, plant size, the location, logistics, the management, market prices etc. However, these figures are thought to provide a good indication of production costs of ethanol produced from corn in Ukraine in a modern plant.

Table 14.4
How to calculate ethanol production cost

1. Capital cost assumptions		Unit
Investment Cost of 200.000 m ³ plant	\$	86,000,000 US\$
Cost of a plant in US\$ per m ³ production capacity	\$	430 US\$/m ³
Interest Rate in %		6.0% Percent
Depreciation Period in years		10 Years
Yearly capital cost per m³	\$	58.42 US\$/m³
2 Variable cost assumptions		
Energy Cost	\$	71.00 US\$/m ³
Transportation cost in US\$/m ³ ethanol	\$	30.00 US\$/m ³
Other costs in US\$/m ³ ethanol	\$	50.00 US\$/m ³
Total Variable Costs in US\$ per m³	\$	151.00 in US\$/m³
3. Raw Material Cost Assumptions		
Price of corn in US\$/t	\$	90.00 US\$/t
Conversion ethanol per t of corn in m ³ /t		0.390 m ³ /t
Conversion t of corn per m ³ ethanol		2.564 t/m ³
DDGS production in t/m ³ ethanol		0.800 t/m ³
Cost of Corn for ethanol production in US\$/m ³	\$	230.77 US\$/m ³
Price of DDGS in US\$/t	\$	80.00 US\$/t
By product credit	\$	64.00 US\$/t
4. Total cost calculation in US\$/m ³		
Capital cost	\$	58.42 US\$/m ³
Variable cost	\$	151.00 US\$/m ³
Raw material cost	\$	230.77 US\$/m ³
By product credit	\$	64.00 US\$/ ³
Total Cost	\$	376.19 US\$/m³

Source: Own Calculations based on Card (2006), Credit Suisse 2006.

The calculation starts with the capital costs, which are assumed to amount to 86 mln US\$ for a dry milling plant with an annual ethanol production capacity of 200,000 m³. Provided the plant is financed at 6 % interest rate with a depreciation period of 10 years the capital cost per produced m³ of ethanol is approx. 58 US\$/m³. A shorter depreciation period and higher interest rates will lead to higher production costs and vice versa. Thus, for an investment in Ukraine these assumptions are at the very low end, and higher costs being likely. This is due to higher interest rates and probably due to a shorter depreciation period in Ukraine, the main reason for this being the political uncertainty of any investment in Ukraine, like rising taxes or export bans for the products produced.

The variable costs depend mainly on energy, transportation and other costs, which comprise, for example, the enzymes for starch fermentation and labour. In this example they are assumed to amount to 151 US\$/m³.

The third cost item is the raw material cost. The example is built on a corn price of 90 US\$/t. Most important is the conversion factor of any ethanol plant. In this example it is assumed that 0.39 m³ of ethanol can be produced per t of corn, which corresponds to a corn use of approx. 2.56 t for the production of one m³ of ethanol. This value is something modern plants can definitely achieve depending on the technology and on the starch content of the corn. Modern US plants get even higher extraction rates of 0.40 to 0.41 m³ of ethanol per t of corn.²⁰⁵ If corn of lower quality or if other grains like wheat or barley are used these conversion factors would be much lower at 0.35 to 0.38 m³ ethanol per tonne of grain.

The by-product of ethanol production is the grain residue: the hull, the protein and some solubles from the fermentation process. This can be either fed directly to the livestock sector or dried and then fed to livestock. The product is called DDGS (Distillers Dried Grain with Solubles). In the calculation it is assumed that approx. 0.8 t of DDGS are produced per m³ of ethanol. The price is assumed to be 80 US\$/t. Accordingly, the corn needed for the production of one m³ of ethanol costs 231 US\$/m³, and the by-product credit amounts to 64 US\$/m³, which totals 160 US\$/m³. In total, the production cost in the example amounts to 376 US\$/m³.

Based on these figures the maximum bidding price of corn or any other grain can be calculated at a given crude oil price and by-product price (Table 14.5). Starting with a crude oil price of 60 US\$/bbl (a) or 490 US\$/m³ (c), the maximum bidding price for bioethanol is approx. one third of the price of gasoline or 324 US\$/m³ (d) due to the much lower energy content of ethanol.

Capital costs, variable costs and the by-product credit are taken from Table 14.4. By subtracting all this from the price of ethanol one gets the amount that can be used for purchasing corn. As the conversion rate is assumed to be 2.56 t of corn per m³ of ethanol produced, this figure needs to be divided by 2.56. This results in the maximum bidding price of corn of 69.57 US\$/t (l). Thus, at crude oil prices of 60 US\$/bbl and a price for DDGS of 80 US\$/t any ethanol plant can bid almost 70 US\$/t for corn. At higher corn prices the plant would not be able to cover all costs and would run a loss.

²⁰⁵ The processing costs depend on the type of milling process, whereas wet milling and dry milling can be distinguished. The wet milling process has a somewhat lower conversion factor; however, the by-products from wet milling — normally corn oil, corn gluten meal and/or corn gluten feed — have a higher value. The dry milling process has better conversion rates, but the value of the by-product — mainly DDGS (distillers dried grain with soluble) — is lower.

Table 14.5
Calculation of the maximum bidding price for corn

1.	Calculation of the maximum bidding price		
a	Price of crude oil in US\$/bbl	\$60.00	
b	Rice of gasoline in US\$/bbl	\$78.00 = a * 1.3	
c	Rice of gasoline in US\$/m ³	\$490.61 = b/0.1589873	
d	Maximum price of bioethanol in US\$/m ³	\$323.80 = c * 0.66	
Production cost			
f	Capital cost in US\$/m ³	\$58.42	
g	Variable cost in US\$/m ³	\$151.00	
h	Total production cost net of corn in US\$/m ³	\$209.42 = f + g	
i	By product credit in US\$/m ³	\$64.00 = 0.8 * PDDGS	
j	Total production cost minus by product credit in US\$/m ³	\$145.42 = h - i	
k	Price of ethanol minus production costs in US\$/m ³	\$178.38 = d - j	
l	Maximum bidding price for corn in US\$/t	\$69.57 = k * 0.39	
Prices and conversion factors		Assumed Parameters	
	Price of crude oil in US\$/bbl	Ethanol prod. out of corn in m ³ /t	0.390
	Price of DDGS in US\$/t	Energy density of ethanol/gasoline	0.660
		DDGS prod. per m ³ ethanol	0.800

Source: own calculations based on Card (2006), Credit Suisse 2006.

Again, the calculation depends on a number of assumptions. The factors that have the biggest impact on the maximum bidding price are the crude oil price and the price of the by-product DDGS. This is accounted for in Table 14.6.

Table 14.6
The maximum bidding price for corn at different crude oil prices and DDGS prices

		Crude oil price in US\$/bb							
		I	\$40	\$50	\$60	\$70	\$80	\$90	\$100
Price for DDGS in US\$/t	\$60	\$21	\$42	\$63	\$84	\$105	\$126	\$148	\$169
	\$70	\$24	\$45	\$66	\$87	\$109	\$130	\$151	\$172
	\$80	\$27	\$49	\$70	\$91	\$112	\$133	\$154	\$175
	\$90	\$31	\$52	\$73	\$94	\$115	\$136	\$157	\$178
	\$100	\$34	\$55	\$76	\$97	\$118	\$139	\$160	\$181
	\$110	\$37	\$58	\$79	\$100	\$121	\$142	\$163	\$184
	\$120	\$40	\$61	\$82	\$103	\$124	\$145	\$166	\$187

Source: own calculations based on Card (2006), Credit Suisse 2006.

The figures used in Table 14.5 are highlighted. At lower crude oil prices of only 40 US\$/bbl the maximum bidding price for corn becomes rather low, for example 21 US\$/t at a price of DDGS of 60 US\$/t. Much higher grain prices can only be achieved at higher oil prices. A crude oil price of 110 US\$/bbl would result in a maximum bidding price for corn of up to 187 US\$/t. When higher corn prices are paid by the industry in Western Europe or the US, this has mostly to do with the subsidies paid for ethanol consumption.

Other factors that have an impact on the calculation are especially the conversion rates. Much lower conversion rates, for example for wheat and barley, lead directly to lower bidding prices for these grains. Also higher production costs have a negative effect on the maximum bidding price for grain.

A very important aspect to add is that the market price for ethanol is currently not yet fully linked to the crude oil price either in the US or the EU. The reason is the low incorporation rate of ethanol. Much of the ethanol is used for ETBE production, an antioxidant, which is a substitute for MTBE, another antioxidant in gasoline, which is thought to have a bad effect on the environment. Several federal and state acts regulate this in the USA. Thus, at this level ethanol prices can be much higher than their pure energy value. However, if ethanol should have a certain market share, the pure energy value calculation in Tables 14.4, 14.5 and 14.6 is applicable.

The competitiveness of biofuel production in Ukraine

The calculation of the maximum bidding price of biodiesel plants for rapeseed and of bioethanol plants for grain provides a rough indication of how crude oil prices and the prices for agricultural commodities are interrelated.

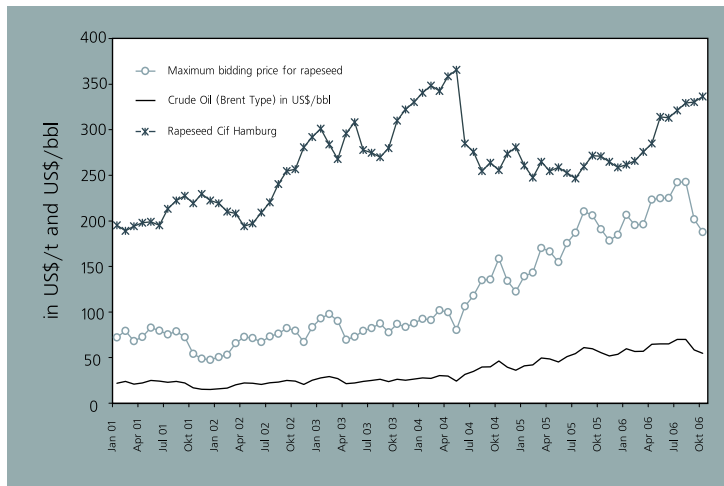


Figure 14.3
The crude oil price, the maximum bidding price for rapeseed for biodiesel production and the market price of rapeseed

Note: The calculation is based on the data used in Tables 14.2 and 14.3 assuming a price for rapeseed meal of 160 US\$/t.

Source: own calculations based on EIA and Oilworld.

Based on these calculations it is now interesting to look into the price relationship in the past couple of years (Figure 14.4.). The crude oil price is used to calculate the maximum bidding price for rapeseed using the calculation from previous section. The higher the crude oil price, the higher the maximum bidding price for rapeseed. However, it is also clear that the maximum bidding price for rapeseed used for biodiesel production has continuously been lower than the market price since January 2001. For this purpose the rapeseed price in Hamburg, Germany, is used, as no consistent time series for rapeseed in Ukraine is available for this time span. The difference between the maximum bidding price of rapeseed and the market price of rapeseed reached its lowest level in the August 2005 to early 2006 period, but was still considerably below the market price. Thus, biodiesel production from rapeseed has never been competitive without subsidies, even at the very high crude oil prices in 2005 and 2006.

The picture is quite similar for ethanol produced from grain. Derived from the crude oil price, the maximum bidding price of ethanol plants for grain was higher

than the market price only once. Only from July to August 2005 was there a short period of time when bioethanol plants could produce ethanol competitively from grain in Ukraine. Since then the drop in the crude oil price and the price rise on the grain markets made bioethanol production uncompetitive without any subsidies.

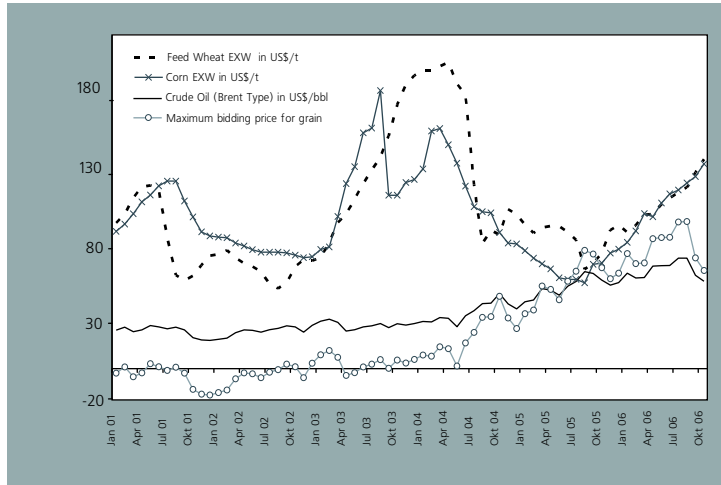


Figure 14.4
The crude oil price, the maximum bidding price for corn of ethanol plants and the market price for corn and feed wheat in Ukraine
 Note: The calculation is based on the data used in Tables 14.4, 14.5 and 14.6 assuming a price for DDGS of 80 US\$/t.
 Source: Own Calculations based on EIA and UkrAgroConsult.

Conclusions concerning competitiveness

Based on the calculation of the production cost of biodiesel and bioethanol and the maximum bidding price for rapeseed and corn or wheat, respectively, a number of conclusions can be drawn:

- ✓ The competitiveness of the biodiesel and bioethanol production depends first and foremost on the prices of its fossil substitute diesel and gasoline, and therefore on the price of crude oil.
- ✓ Further important factors are the market price for the by-product — rapeseed meal and glycerine in the case of biodiesel and DDGS/CGF in the case of ethanol as well as technical conversion factors, the size of the plant and logistics and others. However, it is clear that even the most modern plant with the best conversion factors, which is able to sell by-products at high prices, cannot be competitive if the crude oil price is below a certain level.

✓ From Figures 14.3 and 14.4 it becomes clear that biofuels were not at all competitive over the last five years in Ukraine, even at very high crude oil prices. Any biodiesel and ethanol plant would not have been able to competitively buy the grain or rapeseed on the market for the biofuel production.

✓ Thus, at current price ratios biofuels can only be produced if they are subsidised.

World Biofuel Production, Biofuel Markets and the Impact on World Agricultural Prices

At current price ratios, indeed, almost all countries in the world that produce and consume biofuels subsidise them in one way or another. There is probably only one exception, i.e. bioethanol produced from sugarcane in Brazil. The biofuel boom has already had a huge impact on world agricultural markets as the rapidly increasing use of vegetable oil for biodiesel and grain for ethanol can hardly be met by production.

World biodiesel production and the vegetable oil market

The world vegetable oil market — this comprises the nine most important vegetable oils (oil from soybeans, sunflowers, rapeseed, cottonseed and peanut seed as well as palm and palm kernel oil, coconut oil and olive oil) — amounts to approx. 124 mln t in the 2006/07 marketing year compared to 118 mln t in the 2005/06 marketing year.²⁰⁶ This compares to a world production of crude oil of almost 4.3 mln t in 2005/06, of which more than 50 % is used for transport. Thus, even if all the vegetable oil produced in the world is used for biodiesel production, leaving nothing for human consumption, only 2.8 % of the world oil demand could be substituted with this vegetable oil. In the 2005/06 marketing year, world biodiesel production was 5 to 6 Mio. t, and this is expected to increase by another 4 mln t in 2006/07. Thus, biodiesel production could increase to 9 — 10 mln t in 2006/07, substituting approx. 0.2 to 0.3 % of global crude oil use or 0.4 to 0.6 % of crude oil for transport use.

Among the vegetable oils, palm oil and palm kernel oil account for almost 44 mln t of total vegetable oil production in 2006/07 and their share in world production is 35 %. Soybean oil accounts for 35.7 mln t, or 29 %, rapeseed oil for 17.9 mln t, or 14 %, and sunflower oil for 10.8 mln t, or 9 %. Thus, palm oil and soybean oil together provide a share of almost two thirds of world vegetable oil production, and, most interestingly, this share has increased from approx. 60 % in 2000/01 to 64 % in 2006/07. This has happened despite the boom in rapeseed

²⁰⁶ Other vegetable oils and oils from animal origin are not included in this figure (sesame oil, corn oil, castor oil, linseed oil, butter fat, lard, tallow and fish oil). The production of all these oils together provides for another 29 (28.1) mln tons. Thus, the total amount of oil produced in the world is between 145 and 150 mln tons.

oil production, which increased by an average of 5.1 % since 2000, and in sunflower oil production with an increase of 4.3 % p.a. In fact, the ever increasing demand for vegetable oil could be met only by rapidly expanding palm oil production of 8.1 % annually since 2000 and soybean oil production of 5 %.

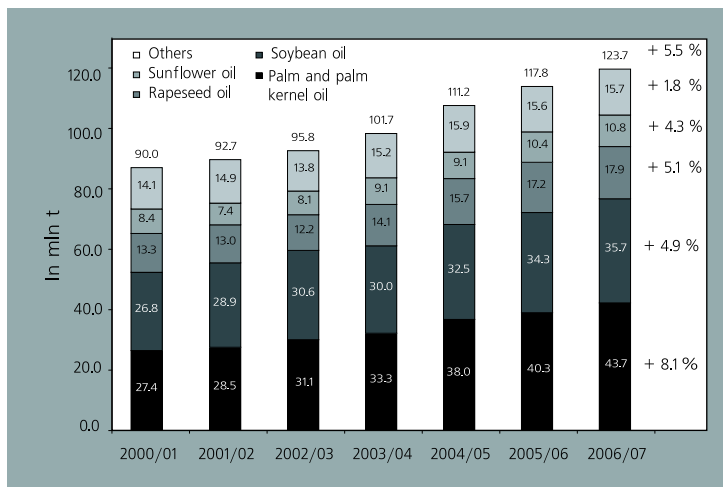


Figure 14.5
World vegetable oil production
Source: USDA, December 2006.

Table 14.7
World vegetable oil supply and demand statistics

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	AV. growth rates
Production	90.0	92.7	95.8	101.7	111.2	117.8	123.7	5.5%
Exports	31.2	33.0	35.6	38.5	42.3	46.0	48.3	7.6%
World Use	88.7	91.8	96.5	100.7	108.4	115.4	122.1	5.5%
thereof industry	8.7	9.5	11.0	12.8	15.3	18.4	21.6	16.3%
thereof food	79.1	81.3	83.5	86.9	92.0	95.9	99.3	3.9%
thereof feed	0.9	1.0	1.0	1.0	1.1	1.2	1.2	5.5%
Ending stocks	8.9	8.6	8.3	8.3	9.7	9.7	9.4	
Stock to use ratio	10.1%	9.4%	8.7%	8.3%	8.9%	8.4%	7.7%	

Source: USDA, December 2006.

This huge increase in production of vegetable oils is urgently needed. As Table 14.7 shows, world use has increased by 5.5 % per annum since 2000. The reason for this increase in demand is the ever increasing use of vegetable oils for food. In China, for example, the growth is unprecedented and every fifth litre of vegetable oil is today consumed in China. But the highest growth rate of oil use is noted in the industry sector. This comprises the oil use for cosmetics, washing detergents and other chemicals, but especially biodiesel. It has increased by an annual average rate of over 16 % since 2000.

The effect on the world supply of vegetable oils is obvious: ending stocks remain very low, and the important stocks to use ratio, where the stocks of vegetable oils are compared to the use has dropped to only 7.7 %, the lowest figure in history. This means that world oil stocks are only sufficient to cover not more than 29 days of demand in the world.

The world is not very well supplied with vegetable oil, and this is the main reason why prices of vegetable oils have increased to very high levels, as shown in Figure 14.6. Traditionally, sunflower oil prices have been highest among the most important oils.

This has changed recently due to the biodiesel policy in the EU and especially in Germany, which favours rapeseed oil over other vegetable oils due to its properties. Thus, rapeseed oil prices are now as high as 850 US\$/t in the EU, or 136 US\$/barrel. Other oil prices followed the price hike, with sunflower oil being the second most expensive oil followed by soybean oil and palm oil.

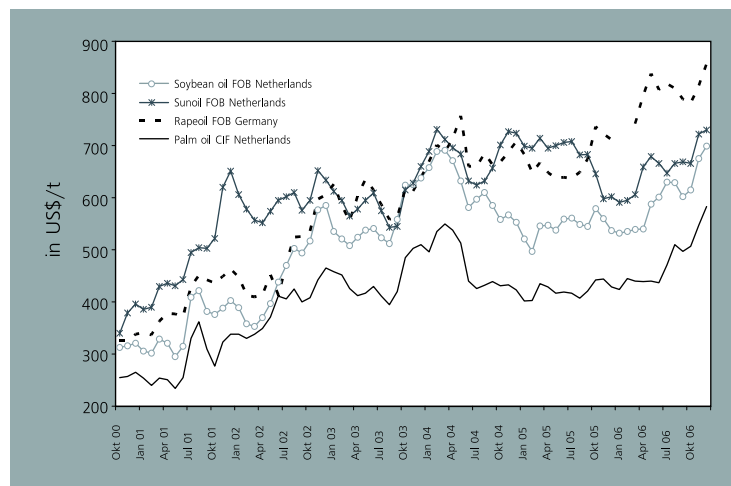


Figure 14.6
 Monthly vegetable oil prices in US\$/t from October 2000 to December 2006
 Source: Oilworld.

World bioethanol production and the grain market

Total world ethanol production in the calendar year 2006 is estimated at 51 mln m³, a sharp increase by over 10 % compared to 46 mln m³ in 2005. As the energy content of ethanol is approx. 66 % of that of gasoline, ethanol substituted roughly 0.8 % of world crude oil demand of 4.3 bln t. Most of this ethanol production is concentrated in Brazil, which accounts for approx. 19 (18) mln m³, and in the USA with approx. 17 (15) mln m³. Almost all the ethanol produced in Brazil and also some of the ethanol production in other countries is based on sugar cane or even other products. Nevertheless, a high share of ethanol is produced from grain, and based on total production it can be assumed that 66 mln t of grain were used for ethanol production in 2006. This figure will most likely rise by another 12 to 15 % to approx. 75 mln t in 2007. To put this figure into perspective, it is equivalent to almost the entire Russian grain crop or double the Ukrainian grain crop in 2006.

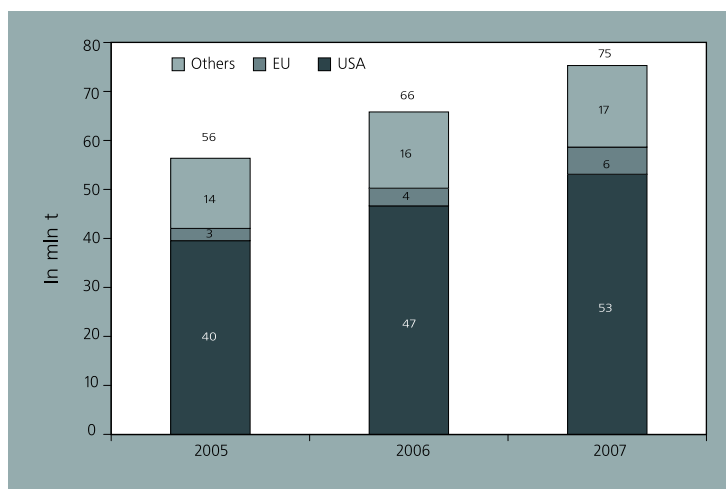


Figure 14.7
Estimated world grain use for ethanol production
 Source: Own estimates based on F.O. Licht.

At first glance, the additional demand from ethanol is not that big compared to the total use of grain, which is depicted in Figure 14.7. Of the total world grain use of over 2 bln t, demand from the ethanol industry accounts for 3 to 4 %. However, this comes on top of an increase in demand that has been seen over the last couple of years anyway. The growing world population needs more grain for direct human consumption, and, accompanied by higher incomes especially in China and other Asian countries, demand for feed grain has increased sharply. This is why world production of grain has not been able to keep up with world demand.

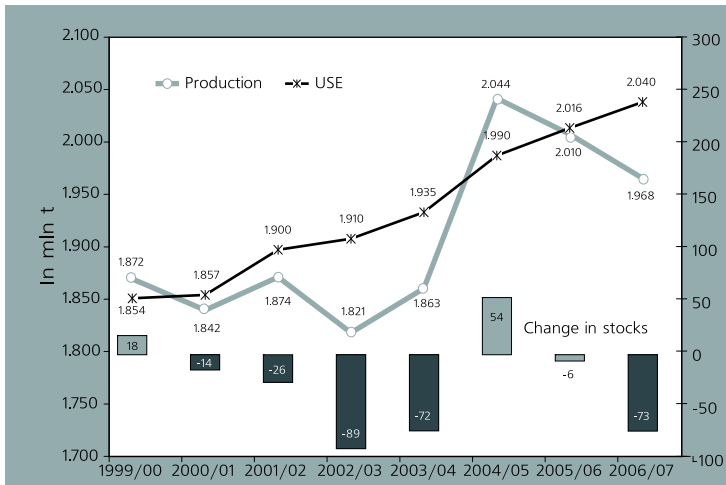


Figure 14.8
 World grain production, use and the change in stocks
 Source: USDA.

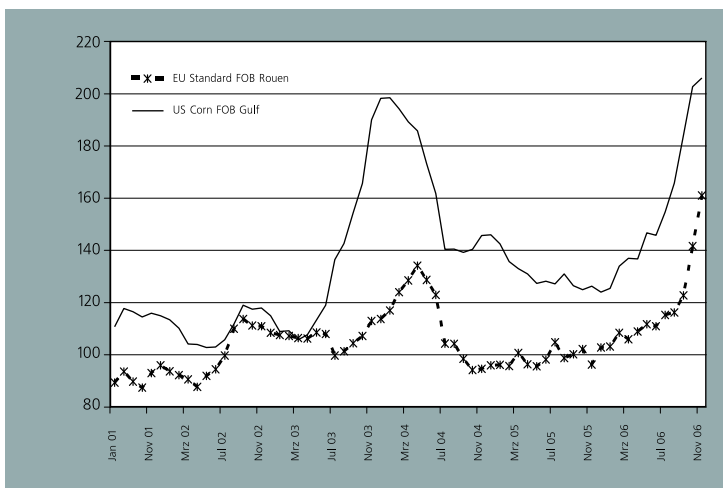


Figure 14.9
 World wheat and corn prices in US\$/t
 Source: International Grains Council.

There has been only one year since 1999 when world production was larger than

world demand, and that was in 2004 when growing conditions were excellent literally all over the world. All other years ended with a depletion of world grain stocks, which have dropped from approx. 590 mln t in 1999/00 to only 319 mln t in 2006/07. This is also shown in Figure 8, and it is clear that the additional ethanol demand has not caused, but has contributed to, the rapid decline in world grain stocks.

As the stocks to use ratio for world grain will drop to only 16 % in 2006/07, the lowest level since the early 1970s, world market prices have skyrocketed in the last seven months (see Figure 14.9) and have reached the highest level since 1996.

Conclusion for world agricultural markets

It is clear that the demand generated by biodiesel and bioethanol production comes on top of an ever increasing demand for agricultural products. This has heavily contributed to the very high world market prices.

- ✓ Prices for agricultural products will be heavily influenced by increasing biofuel production. Along the value chain, prices will depend on the maximum bidding price of biofuel producers for these agricultural products. Consequently, all subsidies paid to the biofuel sector will result in higher prices for agricultural products. This will have a significant impact on the profit margins in the biofuel industry. Margins will decrease substantially. An example is the biodiesel industry in the EU and especially in Germany. Due to ever increasing prices for vegetable oil and a change in government policies the profit margins have decreased. The German association for biofuels (BBK) made the assessment in its latest newsletter that in late 2006 more than 25 % of all biodiesel producers in Germany were not able to cover all costs. Thus, the biofuel boom leads to higher prices and therefore higher incomes of farmers, but it will most likely not lead to exceptionally good profit margins in the biofuel industry.
- ✓ Politically motivated biofuel production will further increase in the years to come, and thus, prices of agricultural commodities will depend heavily on energy prices plus all government programs to subsidise or to mandate biofuels. Therefore, prices for agricultural products will most likely remain high. Furthermore, as the demand from the biofuel sector is rather inelastic at lower prices, the markets are expected to become much more volatile.
- ✓ Whether the additional demand for agricultural products can be met is very difficult to say. High prices are the most important incentive for farmers to increase production. However, it takes some time to mobilize additional land resources in the world, and there is not that much land available which can go into production. Furthermore, water supply is often restricting any additional land use. Productivity can increase due to better management and higher input use.

But in a year with bad weather conditions this will hardly help to increase production. Thus, world agricultural prices will depend even more on the weather than in the past.

✓ Additionally, some countries in the world, like Argentina or Ukraine, have implemented export barriers, which lead to much lower prices in very important agricultural countries. Thus, the incentives cannot be felt by farmers in Ukraine and Argentina, and this is why they cannot react accordingly by increasing production.

Towards a Biofuel Strategy for Ukraine

Ukraine does have in principle three strategic options for its own biofuel production and consumption policy.

1. Ukraine could follow a free market approach. Thus, the government would not directly foster the production and consumption of biofuels but provide a good investment climate. It would be up to investors to decide whether to invest in the biofuel sector in Ukraine and whether to export the biofuels or sell them domestically on the Ukrainian market.
2. Ukraine could foster domestic production for the export of biofuels. The role of the government would then be to develop an export promotion strategy and program.
3. Ukraine could foster the domestic production *and* use of biofuels. In this case the government would actively promote production and subsidise consumption of biofuels.

First option: The free market approach

A free market approach for biofuel production in Ukraine would mean that the Ukrainian government would neither directly subsidise the production of biofuels nor its consumption. Also any trade distorting measures like an export tax on rapeseed would be excluded. However, the free market approach is not a "lean back and do nothing policy". There are rather some aspects for the state to regulate:

Ukraine should do everything to provide a favourable investment climate. This recommendation is really not new; however, the recent government interference in the Ukrainian grain markets with export quotas has sent a clear signal to everyone around the globe: Investments in Ukraine are very risky and in one year investors can lose more than they have earned in many years before. Thus, the grain export quota was indeed very counterproductive for any investment in the Ukrainian biofuel sector. Potential biofuel investors are wondering whether Ukraine will close its borders for the export of biofuels once domestic

grain prices rise over a certain level. Thus, Ukraine needs a long-term and absolutely reliable policy commitment not to interfere in the export market. This is probably more important than any subsidy or special tax treatment.

It is also important to develop quality standards for biofuels that are internationally compatible. This is important to raise confidence in biofuel use and to enable exports of these biofuels. This is recognised by the government and the standards are currently being developed.

Research and development is another task for the government. A clearly defined research policy for biofuels in Ukraine would not duplicate the research already done in other countries, but could concentrate on the adaptation of internationally available knowledge to Ukraine. Additionally, a social, environmental and economic assessment is crucial as well. The impact biofuels have on world agricultural markets is not very well understood, although this impact is huge for Ukraine already now.

The free market approach would have a number of advantages for Ukraine. Except for the research, it would neither cost taxpayers money nor would it increase the energy prices in Ukraine. Ukraine's agricultural sector would get the maximum benefit from the biofuel boom. In fact, Ukraine has the opportunity to profit actively from the subsidies paid in other countries like the EU or the USA for biofuel production and use. All these subsidies will most likely lead to much higher prices for agricultural products and the Ukrainian government needs to do nothing other than letting their farmers benefit from these prices. And if these high world market prices are transmitted to Ukrainian farmers they will very soon react and increase productivity so that the forthcoming years could generate a real boom in the Ukrainian agricultural sector and the Ukrainian countryside. The development of rapeseed markets during the last years is a good example for this development. If investors figure out that it makes sense to produce biofuels in Ukraine they could do it at their own risk. In this way such an investment and the employment opportunities created would not cost the government any money.

Second option: Fostering domestic production of biofuels for export

A second option for Ukraine would be to embark on an export promotion strategy for biofuels. Compared to the free market approach this strategy would include an active support of biofuel production in Ukraine for the export of biofuels to the world markets. However, this would not exclude biofuel use in Ukraine if it were competitive without any further subsidies.

Such a strategy would imply that Ukraine would export biofuels instead of agricultural products or goods produced from agricultural products like vegetable oil. Possible options that are discussed in Ukraine are:

- ✓ First option is to subsidise the production of biofuels by direct money transfers. This could be linked to the investment of a biofuel plant via grants, interest rate subsidies, tax exemptions or other measures.
- ✓ Another policy option more or less openly discussed in Ukraine is to introduce export taxes or export quotas not only for grain, but also for rapeseed. This would reduce the domestic market price and therefore the price farmers receive for their products.

As with all subsidies, somebody in society needs to bear the cost if biofuel production is subsidised. Using direct subsidies to foster biofuel production costs taxpayers money, and the question arises whether this is a good investment. Indeed, the jobs created in a biodiesel or bioethanol plant are rather small, as the process is capital intensive, but not labour intensive. The EU-Commission, for example, has calculated that the subsidies for the biofuel sector create a number of jobs. However, the subsidies which need to be paid by other sectors of the economy destroy jobs, and the EU Commission states that the net job gain is very small or could be even negative.

If the biofuel sector is subsidised via a differentiated export tax as in the case of sunflower seed the farmers bear the cost, and this cost can be huge. A 20 % export tax on rapeseed would reduce farmers' revenues by 60 US\$/t at current market prices. But even more important is the dynamic loss. Farmers' incentive to increase production would be severely diminished, and Ukraine would need even longer to reach its ambitious goals to increase agricultural production. Thus, any policy that restricts the free trade of agricultural products is directly conflicting with the goals of the draft Agricultural Development plan of the Ukrainian government for 2015.

Any export promoting policy in Ukraine faces difficult obstacles at the international level as imports may be restricted by importing countries. The EU and the USA are by far the biggest import markets for biofuels. However, these markets are heavily protected especially for bioethanol. As can be seen from Table 8 the EU import tax for ethanol is 19.2 €/hl, as mostly undenaturated ethanol is used in the EU for bioethanol use. This equals to 0.19 €/l or 192 €/m³. This is currently approx. one third of the market price in the EU, and any ethanol imports from Ukraine would hardly be competitive at this level. The import tax for ethanol into the USA is 2.5 % of the value plus 0.54 US\$ per gallon, which equals 0.14 US\$/l or 140 US\$/m³.

Biodiesel as well as rapeseed oil, sunflower oil or soybean oil for technical use bears no import tax when it comes from Ukraine. Thus, any biodiesel producer competes directly with biodiesel producers in the EU. The problem, however is that the EU biodiesel industry already has overcapacities. In such a situation the

production margins of biodiesel tend to decrease dramatically, and according to a German; association for the promotion of biofuels (BBK) already a third of the biodiesel producers in Germany can not fully cover their costs.

Table 14.8
EU Import taxes for biodiesel, vegetable oil and ethanol from Ukraine

KN Code	Description	Normal duty	Duty Rate (GSP)SPGL for Ukraine
3824 9098	Biodiesel	6.50%	0.00%
1514 1110	Low erucic acid rape or colza oil, crude oil for technical or industrial uses other than manufacture of foodstuff for human	3.20%	0.00%
1514 1190	Low erucic acid rape or colza oil, crude oil/other	6.40%	290%
1512 1191	Sunflower seed oil, crude, for technical purposes	3.20%	0.00%
1512 199010	Sunflower seed oil, crude, for other purposes	6.40%	290%
1507 1010000	Soybean oil, crude, for technical or industrial use. Other than food	3.20%	0.00%
1507 109000	Soybean oil, crude, for technical or industrial use. Other than food	6.40%	290%
2207 1000	Undenatured ethyl alcohol of an alcoholic strength by volume of 80% Vol. or higher	19.2 €/hl	19.2 €/hl
2207 2000	Denatured ethyl alcohol and other spirits of any strength	10.2 €/hl	10.2 €/hl

Source: TARIC: http://ec.europa.eu/taxation_customs/dds/cgi-bin/tarchap?Lang=EN.

Third option: Fostering the domestic use and production of biofuels

Our calculations clearly show that biofuels have hardly ever been competitive to fossil fuels in the past. Whether they will be in the near future is difficult to say. The likelihood exists that prices for agricultural commodities will increase, thus making biofuels even less competitive. But nobody knows what the oil price will be in the years to come. In January 2007 the oil price dropped towards 50 US\$/bbl, more than one third from its highs in 2006. Hence, forecasts of big international investment banks that predicted oil prices of 100 US\$/bbl are unlikely to be realised in the near future. Thus, the likelihood that biodiesel from rapeseed oil and bioethanol from grain will be competitive to fossil fuels in the next couple of years is low.

The consequence is clear: biofuels are more expensive than fossil fuels, and either the Ukrainian tax payer, the consumer of fuels or the producer of agricultural products need to subsidise the biofuel production or use in Ukraine. Some examples show the mechanisms:

The policy in Germany calls for a mandatory blending of biofuels into diesel and gasoline. In the case of biodiesel this is approx. 5 % of biodiesel into the diesel. Due to this policy the prices of the blended diesel is approx. 2 to 3 cent per litre higher than it would be without the policy. This does not sound like much, but

as Germany uses more than 33 bln litre per year this accounts for 0.8 to 1 bln €. The effects of a mandatory blending policy for Ukraine should be quite similar. As Ukraine uses approx. 5 mln t of diesel a year or 5.8 mln m³, and the additional expenses would account for 3 €cents per litre, Ukrainian car drivers would pay an additional 1 bln UAH per year for their diesel alone.

The second option would be to subsidise the biofuel use directly from the state budget. This could be done by providing a special tax credit to the refining industry, which bridges the gap between biofuel prices and fossil fuel prices. Again, the amount of money needed to provide such a subsidy depends on the price of fossil fuel and the price of the biofuel.

The third option would be to tax farmers, as discussed already under policy option 2, with the consequence that it would reduce the profitability and therefore the incentive for the further intensification of agricultural production.

Thus, promoting the biofuel use in Ukraine would be expensive and cause adverse effects for certain groups of society depending on the policy option used. The costs would increase even further if the share of biofuels used in Ukraine would be higher. As a consequence, reducing the energy dependency of Ukraine by using more biofuels is rather expensive. This does not mean that the goal is impossible to reach; however, there might be more efficient options to reduce this energy dependency. It is out of the scope of this paper to investigate them all, but further research might show that other alternative energies like biomass use could be more beneficial for Ukraine. And it is well known that Ukraine is still among the countries in the world with the highest energy use per unit of GDP in the world. For example, the amount of diesel used per ha in Ukraine is often higher than in Western Europe, although yields are less than half of those of their counterparts in Western Europe! Thus, saving energy is most likely the best way to reduce the energy dependency of Ukraine. Using biofuels and wasting them with very fuel inefficient cars, trucks and tractors is not a good way. Furthermore, the time horizon matters. If crude oil prices increase, Ukraine will be able to establish its own biofuel production and use within a short period of time with available and proven technology on world markets. Until then it seems to be much more profitable to benefit intensively from the biofuel boom in so many other countries of the world.

Glossary

1 st generation biofuels	are established biofuels, i.e. bioethanol and biodiesel.
2 nd generation biofuels	are currently not established and in the R&D stage. BTL, ethanol from celluloses, among others, are 2 nd generation biofuels.
Biodiesel	can be produced from any oil and fat by esterification. For this process the oil is mixed with methanol and a catalyst. This mixture is heated up in a reactor, and the outcome is biodiesel and glycerine. 1 t of oil plus 0.1 t of methanol produces approx. 1 t of biodiesel and 0.1 t of glycerine. Biodiesel is a direct substitute for fossil diesel and can be used purely or can be blended into fossil diesel.
Bioethanol	is produced from sugar via alcoholic fermentation, which produces ethanol and carbon dioxide (CO ₂). Feedstocks that can be used for ethanol production are all sugars or products that can be fermented into sugar like starch from grain and potatoes or even celluloses.
BTL	stands for Biomass-to-Liquid and belongs to the group of synthetic fuels. For the production of BTL-fuels straw, wood and other solid and dry biomasses can be used.
CGF	is Corn Gluten Feed and a co-product of the so-called wet milling process. CGF is a feedstuff that has broad feeding applications in the beef and dairy cattle industries.
DDGS	is Dried Distillers Grains with Solubles. DDGS is a co-product of the ethanol production process from grain using the so-called dry milling process. It contains protein, fiber and oil and is used in the livestock industry.
ETBE	Ethyl tertiary butyl ether is commonly used as a blend stock in the production of gasoline from crude oil. It is created by mixing ethanol and isobutene. ETBE offers air quality benefits that are equal to or greater than those of ethanol, while being technically and logistically less challenging. ETBE is a substitute for MTBE.
Ethanol from celluloses or lignocelluloses	has the same properties as any other ethanol. However, as a feedstock straw or other celluloses can be used. This is fermented by enzymes into sugar that can be used for the alcoholic fermentation.
Glycerine	is a by-product of the biodiesel production process, and 0.1 t of glycerine are produced per ton of biodiesel. It can be used for technical and pharmaceutical purposes but can also be used as feed in the livestock sector.
IEA	the International Energy Agency is a Paris-based intergovernmental organization founded by the Organisation for Economic Co-operation and Development (OECD) in 1974 in the wake of the oil crisis. The IEA is dedicated to preventing disruptions in the supply of oil, as well as acting as an information source on statistics about the international oil market and other energy sectors. http://www.iea.org/
Methanol	is an alcohol, is needed for the biodiesel production.
MTBE	Methyl tert-butyl ether was being used widely as a fuel additive, but production has decreased as various jurisdictions banned the use of MTBE. By late 2006, most American gasoline retailers had ceased using MTBE as an oxygenate, which was substituted by ETBE.

15. The Competitiveness of Different Feedstocks for Bioenergy

This paper was produced in 2007 to identify and to compare the potential of various raw materials for bioenergy. First, the paper focuses on agricultural commodities commonly used to produce biofuels such as bioethanol and biodiesel. Next, the opportunities associated with the production of bioenergy from other raw materials are discussed. It is concluded that producing biodiesel on the basis of rapeseed as raw product would be questionable in Ukraine because of high rapeseed world market prices. Biodiesel production vis-à-vis high commodity cost has never been competitive without subsidies in the past. The better option would be to produce rape seed and rape seed oil and sell this on the world market. Producing bioethanol with corn and sugar beets brings similar results as for biodiesel. Instead, biogas production with organic waste from livestock production for local energy generation, and the usage of straw and wood for heating systems could provide new opportunities for some agricultural branches and improve energy supply in rural areas.

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Introduction

Renewable energy offers interesting opportunities for agriculture and forestry in Ukraine. Besides, energy security and the use of bioenergy are important topics. Prices for fossil fuels have grown and so have discussions about greater independence from imported energy. However, conditions and potentials for the use of renewable energies differ from country to country. The production of biofuels is just one way to use biomass for energy production. But renewable energy sources (RES) offer more possibilities. In each case it is necessary to compare the market prices or opportunity costs of agricultural commodities and raw materials that are used for producing renewable energy. After all it is the costs of RES that largely determine the price of bioenergy. High world energy prices and an increasing demand from the food, feed and energy industries result in high prices for agricultural commodities like grain, oilseeds and corn. As a consequence, higher prices of raw products do have direct influence on the profitability of energy production.

The agricultural sector has the potential to supply raw materials that are needed to produce bioenergy. In a best case approach, this could result in lower green house gas (GHG) emissions and benefits for soil and water quality as well as an enhanced biodiversity. However, it is economic efficiency that determines whether such an approach should or should not be realised.

This paper deals with various crops and agricultural raw materials and their technical and economic potentials to serve as RES. Special emphasise is put on the economic costs and benefits in connection with energy production based on biomass.

Crops that can be used for biofuel production

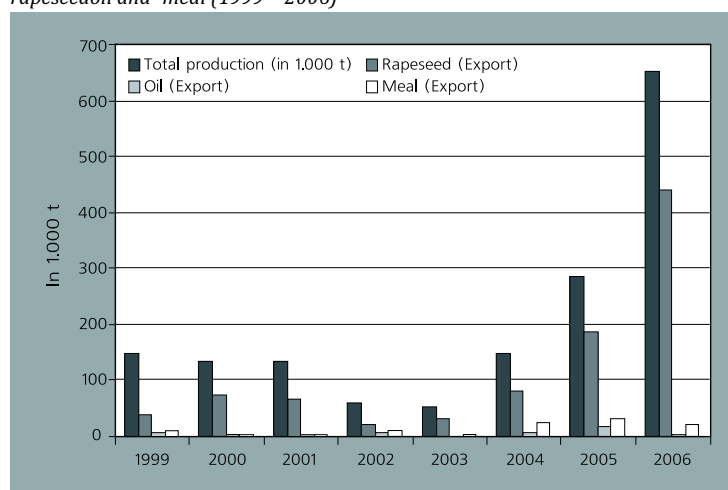
In this part we focus on agricultural commodities to produce biofuels such as bioethanol and biodiesel. Because relevant prices, technologies and institutions undergo rapid changes, there is need for a dynamic approach to answer the question at which costs one can produce a single litre of biofuel. In this respect, high world energy prices and an increasing demand from the food, feed and energy industries determine high prices for agricultural commodities like grain, oilseeds and corn, which exert special influence on the profitability and competitiveness of bioenergy production.

Rapeseed

In Europe, rapeseed has been cultivated since the beginning of the 19th century. Both spring and winter types have been developed. Although the market is dominated by winter rapeseed but the spring type is also cultivated in many regions.

In Ukraine farmers produce winter and spring varieties but the share of winter rapeseed reflects a steady growth (from 63 % to 82 % over the last three years). In general, crops of the winter-hardy cultivars realize higher yields than the spring type. Only in case of an extremely hard winter lasting until late springtime, farmers growing spring rapeseed are realizing a benefit as those plants with the winter growth habit suffer from winterkill and do not meet their theoretical yield potential. Other reasons for spring rapeseed are site-related factors and natural local conditions concerning the vegetation period or operational sequences on the farm (e.g. a lack of time when winter rapeseed should be sown in late summer but capacity for sowing in springtime). Rape seed is a comparatively ambitious crop. The seedbed must be well prepared and quality seeds, fertilizer and several pesticides are needed to achieve high yields. For crop rotation it is advisable to cultivate rapeseed every 4—5 years. An important advantage is the positive effect rapeseed has on the following crop. In Ukraine, the area cultivated with rape seed has been increased rapidly since 2003. From 2004 till 2006 the volume of the rapeseed production has more than doubled from 148.300 t to 647.100 t, as depicted in

Figure 15.1
Total production of rapeseed in Ukraine and export share of rapeseed, rapeseedoil and -meal (1999—2006)



Source: Ukrainian Ministry for Agricultural Policy; Official USDA Estimates.

Rapeseed as an agricultural commodity is exported to the world market. This booming trend for rapeseed production and export is based on a growing worldwide demand. Especially the EU with its rising biodiesel production makes a market for rapeseed and rapeseedoil. The following Figure 15.2 shows the global increase in oilseed production since 2001/2002. The worldwide production of

oilseeds is dominated by soybeans, followed by cottonseed, peanuts and rapeseed.

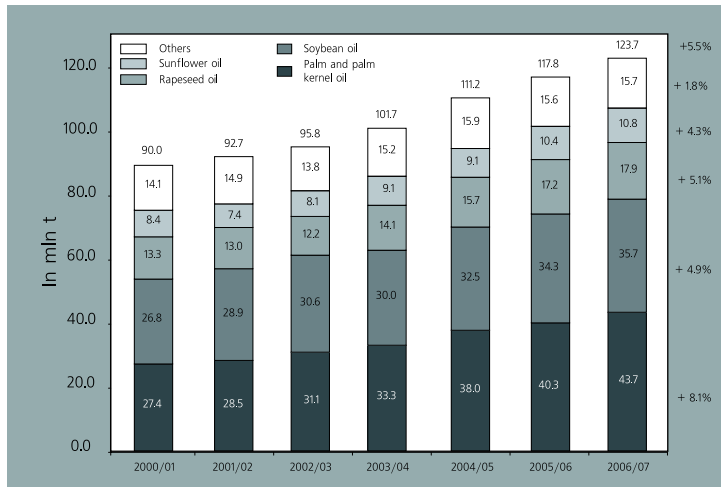


Figure 15.2
The world vegetable oil production
 Source: USDA, Toepfer, December 2006.

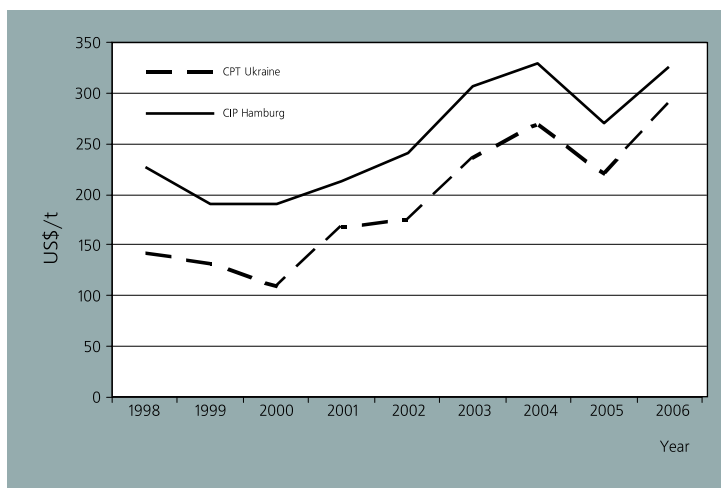


Figure 15.3
Prices paid for rapeseed on the world market and for Ukrainian exports (1998—2005)
 Source: State Statistics Committee of Ukraine (2006); Lembke (2005).

The Ukrainian farmers benefit from this international trend that is based on the increasing biofuel demand. In the past, the Ukrainian oilseed market was dominated by sunseeds. The production and domestic crushing of rape seeds and soybeans have been on the rise during the last years. In the case of soybeans this increase has been caused by growing demand from the livestock sector, mainly from Asia.

Figure 15.3 shows that the price paid for exported rapeseed from Ukraine (CPT Ukraine) follows the world market price (CIP Hamburg). The price level line on the world market runs above the Ukrainian price. However, the decreasing spread between international and domestic markets indicates decreasing transaction costs in Ukraine due to considerable domestic and foreign investments in market infrastructure and port logistics.

In a detailed analysis Lakemeyer (2007) concludes that rapeseed production in Ukraine is competitive with other countries. At current production costs, Ukrainian farmers achieve good profits with rapeseed production. It is predictable that sooner or later the domestic crushing industry will invest in rapeseed processing installations in order to increase the share in the value chain for Ukraine. However, the question whether rapeseed oil will be further processed into biodiesel within Ukraine or whether it is exported elsewhere has to remain unanswered for the time being.

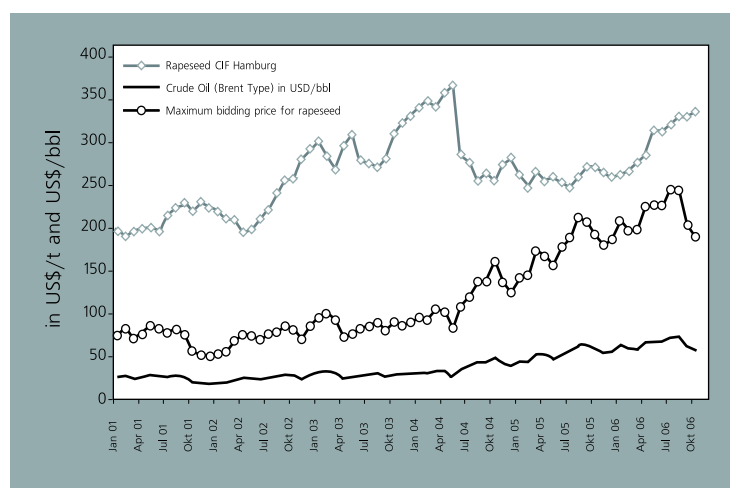


Figure 15.4
 The crude oil price, the maximum bidding price for rapeseed used for biodiesel production and the market price for rapeseed
 Source: IER (2007).

At current price ratios of energy, commodities and raw materials domestic bio-fuel production is not profitable. Thus, it seems to be a better strategy to sell rather than process domestically produced commodities and thus benefit from participation in international markets until price ratios substantially change.

Figure 15.4 presents the results of a model calculation for the investment and running costs of biodiesel production to deduct the maximum bidding price for rapeseed paid by biodiesel plants in Ukraine under market conditions. It becomes clear “that the maximum bidding price for rapeseed used for biodiesel production has continuously been lower than the market price since 2001.” (IER:2007).

The EU’s political decisions on the use of biofuels so far have had an inflating effect on world market rapeseed prices. In this respect, the competitiveness of using rapeseed for biofuel production in Ukraine is questionable, given that biodiesel production has never been competitive without subsidies. However, Ukrainian farmers and oilseed processors may benefit from the EU’s highly subsidised biodiesel sector by realising increasing exports and thus rising profits.

Grain (wheat and maize)

Figure 15.5 shows the production of total grain crops and wheat for Ukraine over the last 6 years. In the Ukrainian market, wheat is the most important grain.

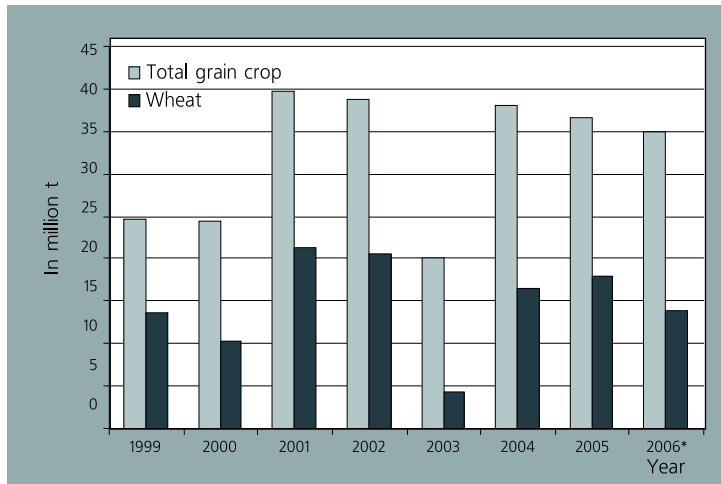


Figure 15.5
 Ukrainian crop and wheat production (million tons)
 Source: Own presentation with data from AgroPerspectiva (2007) and UkrAgroConsult (2006).

The curve progression reflects the production results from 1999 to 2006. Last year's harvest was well below previous years because of bad weather conditions, which reduced harvest acreage and yield. But this is not as drastic as it was in 2003. Prices for wheat on the world market have displayed an increasing trend since last autumn.

Following reduced harvests in some regions of the world as well as increased feed demand (mainly in Asia) and increased demand from the bioethanol industry (mainly in the USA) prices for wheat and corn traded on the world market has increased drastically in the course of the year.

Table 15.1
Calculation of the maximum bidding price for corn

2. Calculation of the max. bidding price for corn		
a	Price of crude oil in US\$/bbl	\$60.00
b	Price of gasoline in US\$/bbl	\$78.00 = a * 1.3
c	Price of gasoline in US\$/m ³	\$490.61 = b/0.1589873
d	Maximum price of bioethanol in US\$/m ³	\$323.80 = c * 0.66
e Production cost		
f	Capital cost in US\$/m ³	\$58.42
g	Variable cost in US\$/m ³	\$151.00
h	Total production cost net of corn in US\$/m ³	\$209.42 = f + g
i	By product credit in US\$/m ³	\$64.00 = 0.8 * P DDGS
j	Total production cost minus by product credit in US\$/m ³	\$145.42 = h - i
k	Price of ethanol minus production costs in US\$/m ³	\$178.38 = d - j
l	Maximum bidding price for corn in US\$/t	\$69.57 = k * 0.39
Prices and conversion factors		Assumed Parameters
	Price of crude oil in US\$/bbl	\$60.00 Ethanol prod. out of corn in m ³ /t
	Price of DDGS in US\$/t	\$80.00 Energy density of ethanol/gasoline DDGS prod.per m ³ ethanol

Source: IER (2007).

Under these assumptions the maximum bidding price for corn is 69 US\$/t, which is relatively low in comparison to the actual world market price for corn. The crude oil price exerts the most important influence on the maximum bidding price as is also supported by IER (2007). Taking into account the current crude oil price level, there are no incentives to produce bioethanol with corn. In the next chapter we calculate the bioethanol production with sugar from sugar beet.

Sugar

Assuming that Ukraine considers producing ethanol from domestically produced sugar we calculate again the production costs.

Table 15.2
Cost calculation for bioethanol production based on sugar beet

1. Capital cost assumptions		Unit
Investment cost of 200.000 m ³ plant	90.000.000	US\$
Cost of a plant in US\$ per m ³ production capacity	450	US\$/m ³
Interest rate in %	6	%
Depreciation period in years	10	Years
Yearly capital cost per m ³	57.2	US\$/m ³
2. Variable cost assumptions		
Energy cost	67.00	US\$/m ³
Transportation cost in US\$/m ³ ethanol	90.00	US\$/m ³
Other costs in US\$/m ³ ethanol	37.50	US\$/m ³
Total variable costs in US\$ per m ³	194.50	US\$/m ³
3. Raw material cost assumptions		
Price of sugar in US\$/t	118.00	US\$/t
Conversion ethanol per t of sugar in m ³ /t	0.62	m ³ /t
Conversion t of sugar per m ³ ethanol	1.62	t/m ³
By products	0.10	t/m ³
Cost of sugar for ethanol production in US\$/m ³	191.05	US\$/m ³
By product credit	140.00	US\$/t
4. Total cost calculation in US\$/m ³		
Capital cost	57.15	US\$/m ³
Variable cost	194.50	US\$/m ³
Raw material cost	191.05	US\$/m ³
By product credit	13.72	US\$/m ³
Total cost	428,98	US\$/m³

Source: Own calculation based on Data from IER (2007), FNR (2006), Langwost (2002), DMH (2007) and Südzucker (2007).

Due to high production costs it becomes clear that producing bioethanol from domestically produced sugar is not competitive. At the current price level agricultural raw products are too precious to produce biofuel that is not competitive with fossil fuels at given market prices.

This calculation starts with the capital costs. We assumed rather optimistic capital cost of 90 mln US\$ with an annual ethanol production capacity of 200.000 m³. The variable cost includes energy cost, transportation cost and other cost (e.g. the enzymes that are used for the fermentation). The transportation costs are higher for sugar beet because of a lower rate of yield in comparison to wheat for bioethanol production. The raw material cost show the price of sugar (118 US\$/t) calculated on data from the London International Financial Futures and Options Exchange and Ukrainian sugar prices. Conversion cost are at a reduced rate because of the plant size and technical possibilities by using sugar beet instead of wheat. The by-product credit is assumed in a more pessimistic way. Vinasse (fermented molasses) contains nutrients such as nitrogen, phosphate, potash and sucrose. In concentrated form it could be applied as a fertilizer on the field or the clarified vinasse is used as an additive in animal feed. The market

price for vinasse is about 140 US\$/t. Vinasse is the only by-product credit that is allowed for in this calculation. There are other by-products that can be taken into account like sugar beet pulp. Sugar beet pulp is a carbohydrate-rich co-product generated by the table sugar industry and therefore it is more a by-product in the sugar plant than in the ethanol production process. That is the reason why we do not calculate with a by-product credit for sugar beet pulp that is often used in the animal feed-industry.

Under these assumptions the cost of producing bioethanol in Ukraine with sugar beet totals 428 US\$/m³, which is not competitive with fossil fuels. Compared internationally, it can be seen in the next figure, that the calculated production cost of 428 US\$/m³ are more efficient than those in the European Union but not competitive with the low cost producer Brazil that is using sugar cane as raw material. Sugar cane is a perennial tropical crop and therefore less costly than annually planted sugar beets.

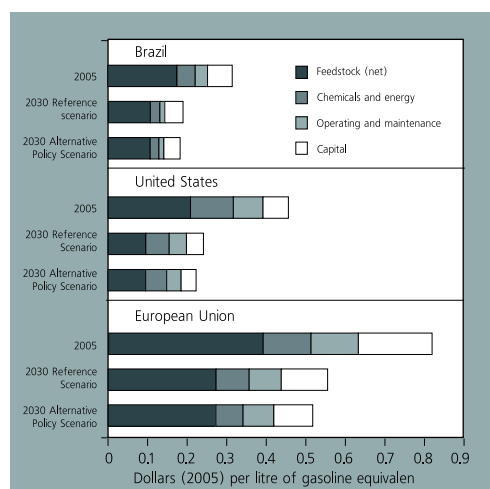


Figure 15.6
Production cost of ethanol in Brazil, the European Union and the United States
 Source: (Costs including current rates of subsidy to crops and ethanol production²⁰⁷) OECD 2006.

Due to a combination of climate, soil and relatively low labour and land cost, Brazil is currently the world's lowest-cost producer of sugar cane and, therefore, ethanol. In comparison, the production costs for producing ethanol are the lowest worldwide (Figure 15.6). This underlines the importance of raw product cost that is used for biofuel production. Sugar beet and also grain are traded at high world market prices on the food market. Therefore their prices are currently too high to allow for their competitive use as RES. In 2005, roughly 50 % of the produced sugar cane output in Brazil was used for ethanol production, the output of which reached 8.2 Mtoe — an increase of 51 % over 2000.

²⁰⁷ For further details with regard to different assumptions about the Reference and Alternative Policy Scenario please refer to OECD World Energy Outlook 2006.

Potential of second generation raw materials

An important way to increase the productivity of biofuel output is to use the whole plant instead of processing only parts of it. This is the second generation of biofuels. It means converting ligno-cellulosic biomass into biofuels. This process of gasification of the feedstock produces synthetic gas (so called syngas) — a mixture of carbon monoxide, hydrogen and other compounds. The syngas can then be converted to diesel (via Fischer-Tropsch synthesis), methanol or dimethyl ether — a gaseous fuel that is similar to propane. Alternatively, the hydrogen can be separated and used as a fuel. Currently, most interest exists in production of diesel via Fischer-Tropsch-synthesis (FT diesel). As yet, there is no commercial production of biofuels through gasification, because of the high cost compared with conventional technologies. However, a considerable amount of research and development is under way to devise commercially-viable processes. To achieve economies of scale, very large plants will probably be needed for the production process. This will require extensive logistical systems for gathering and transporting the biomass raw materials (Hamelinck and Faaij, 2005). Demonstration plants have been built in Germany. The current production cost of FT diesel from biomass is about \$0.90 per litre, based on a woody biomass feedstock price of \$3.6/GJ. The cost could decline to \$0.70 to 0.80/litre in the long term (IEA, 2006).

Other renewable energy sources to produce bioenergy

There are various other energy sources in agriculture and forestry that may be used to produce bioenergy. Some of them are rather cheap and therefore auspicious. It is obvious that biofuels are not in every case the most efficient way to use agricultural products as RES. While the use of (domestically produced or imported) RES could clearly improve energy security in Ukraine, the key question is: At what economic cost? It can be seen that the cost for producing biodiesel and bioethanol are comparatively expensive because of the possible alternative use of the raw materials for high prices on the world food markets. Therefore it makes sense to look at raw materials that may be available at lower cost in Ukraine. This could be crop residues like straw, manure or communal waste to produce biogas and — last but not least — wood.

Straw

After harvesting, the straw stays on the field if it is not needed for livestock farming. To conserve humus for the soil-fertility, straw is often ploughed into the field, but this is not mandatory every year in a well planned crop rotation. The straw surplus differs with the different crops. The average energy content of straw as RES is 4—4.5 kWh/kg. Straw can be used as fuel in small farm straw-fired boilers and in straw-fired DH plants. The amount of straw that is possibly usable for en-

ergy production can be calculated with a look to the current crop production in Ukraine (e.g.: on average of four years of Ukrainian grain production there are 12.8 million ha). Assuming of a low yield on average, the biomass that can be harvested would amount to approximately 23 GJ/ha (e.g. in Germany we calculate higher yields and a more intensive grain production with finally 70 GJ/ha energy from the straw yield). In case the whole Ukrainian straw would be used for energy production, 300 PJ or 7.2 mtoe could be gained annually. This calculation is a first step to get an impression about the idle energy potentials in Ukraine. Zhovmir and Zhelyezna (2005) upgraded this calculation with the knowledge about currently used straw volumes in livestock farming. They come to the result that even if only a certain amount would be used for livestock farming, there will be still 2.5—4 mtoe for energy use available. This is a “cautious” calculation. Given the current developments in the agricultural sector, grain production is becoming more intensive and remaining straw will increase with the grain yields.

Table 15.3
Price for humus and nitrogen contained in straw

Price for humus and nitrogen contained in straw:		
Value of humus	3.68	USD/t straw
Value of nitrogen, phosphate and others	7.36	USD/t straw
Sum	11.04	USD/t straw
Yield of straw	1.90	t/ha
Value/ha	20.98	USD/ha

Source: Own calculation based on data from IER (2006) and KTBL (2005) (2006).

The production of heat from straw is competitive because the value of straw is comparatively low. The value of grain as the proceeding crop is around 13 US\$/t for Ukrainian grain producers. With a yield of around 3 t/ha the value per ha is 39 US\$/ha wheat. For straw we can assume a yield of 1,9 t/ha that should be estimated by the contents of nitrogen, phosphate, potassium, magnesium and others. Approximately 20 US\$/ha should be calculated as value that should be credit against the humus and fertilizer balance of the field. For example a farm sells straw to a heating plant to burn that straw, the minimum price for the straw is 11 US\$/t because this is the value that can be credited for humus and nitrogen-contents.

The prices that can be taken into account for straw as raw material for heating can be calculated in comparison with heating oil or gas. The calorific value of straw (4,7 kWh/kg) is around 50 % lower than that of heating oil (10 kWh/kg).

Heating oil prices paid by consumers are determined by the cost of crude oil.

Adding on the cost to produce the product, the cost to market and distribute the product as well as the profits (sometimes losses) of refiners, wholesalers and dealers determine finally the consumer price. Actually heating oil price is about 50 €/100l. Conseur (2006) analysed the costs of different heating systems with raw products like gas, heating oil, wood pellets or straw in Germany. The database is not identical in every detail with a Ukrainian database but it can be seen as an example for price tendencies.

Table 15.4
Comparison of different raw products for heating use

Raw product	Price	Energy consumption	Degree of efficiency	Price in ct/kwh
Heating oil	81.9 ct/l	9.8 kWh/l	90%	9.2
Gas	67.6 ct/m ³	9.2 kWh/m ³	95%	7.7
Wood pellets	261.3 USD/t	4.9 kWh/kg	90%	6.0
Straw pellets	195 USD/t	4.5 kWh/kg	90%	4.8

Source: Based on Conseur²⁰⁸ (2006).

As can be seen in Table 15.4, the price for straw pellets is cheap in comparison with other raw materials. This means that farmers could gain profits from selling straw to heating companies and Ukrainian consumers — mainly in rural areas — would benefit from lower heating cost.

Manure, sludge and communal waste for biogas production

Producing energy in biogas plants is one of the most flexible ways to provide energy either in small sized plants for households and villages or in modern huge plants securing the energy supply of thousands of people. Today, advanced biogas technologies are available and the investment cost decline. Biogas production is a natural and essential biological process with different types of bacteria that are involved in a digestion process.

A huge number of plants differing in size are built in Europe, but most of them are using agricultural raw products such as corn or crop silage (e.g. of rye or triticale). This is a comparatively expensive way to produce renewable energy, because of the production cycle of the raw material and its opportunity cost as it can be sold for high prices on the food markets.

In other countries, e.g. China, agricultural residues (e.g. manure, straw, sugar beet pulp, sewage sludge, organic waste) are used for biogas generation. Estimates of potential and projections must be interpreted with caution because they can vary widely depending on the different assumptions made. For manure, the available data is often the numbers of livestock. The manure available from

²⁰⁸ All calculations are based on German database and experiences.

households can be estimated on the basis of experience in many other countries. The amount of manure produced by animals depends on amount and type of fodder, some average figures exist for most countries. We try to give a first impression on the potentials that could be realised by livestock farms in Ukraine.

Our own calculations that are based on national cattle and swine herds of roughly 9 and 8 million animals respectively, suggest that Ukraine could by a very conservative estimate produce 8,4 billion m³ of biogas per year from manure, for a potential of 137.3 PJ of energy.

This calculation shows that the largest potential for biogas at low cost is in manure related to agricultural activities. Other potential raw-materials are:

- ✓ sludge from mechanical and biological waste-water treatment (sludge from chemical waste-water treatment has often low biogas potential);
- ✓ organic household waste;
- ✓ organic, bio-degradable waste from industries, in particular slaughter-houses and food-processing industries.

Hence, agriculture could provide the manure from livestock and the resulting sludge at the end of the production process could be used as fertilizer. Liquid manure from livestock has a high value to farmers because of the nitrogenous content. One cubic metre liquid manure transform into an average of 4 kg N, that is 2.4 US\$ based on the nitrogen content. But farmers do not lose the nitrogen during the gasification process so that finally energy could be produced and the liquid manure is still a high valuable fertilizer.

The calculation of the profitability of a biogas plant consists of substantial investment cost, some operation and maintenance cost, mostly free raw materials (e.g. manure and waste), and income from sale of biogas or electricity and heat. Other values for farmers like the value of sludge that can be used as a fertilizer on the fields can be added.

The production of renewable energies can replace fossil fuels to a considerable extent. CO₂- and methane- emissions are reduced and make this RES attractive for Joint Implementation investments. Experiences over a long period show that smell and hygiene problems of sludge and manure are reduced. In economic terms, renewable energy and by-products in the form of liquid fertiliser and soil conditioner are produced.

Wood: using residues and short rotation coppice

Finally, we present the potentials that can be developed in the forestry sector. In saw mills, pulp mills and all wood processing industries, residues are left that can be used for energy purposes. From saw mills it is mainly bark and saw dust.

Pulp mills (e.g. cellulose and paper production) leave black and sulphite liquors as well as wood and bark residues. From sawmills come edgings, chips, sawdust, bark and other residues that are RES at low prices. Some of these residues could be used for pulping or particle- and fibreboard. The residues in forms of larger pieces can be made into wood-chips for wood-chip boilers, while sawdust can be burned in special furnaces or compressed into wood pellets or bricks that can be used in smaller furnaces and ovens like it is already done in many households. Often wood industry uses its wood residues to meet own energy demands for heating, steam production and eventually electricity.

Besides the energy use of wood residues from mills, there is another possible use in the forestry sector. Plantations of fast-growing trees can be grown. This is already done on a larger scale in Sweden using willow and poplar. With an average yield of 10 tons/ha of dry biomass, 500 thousand tons of biomass can be harvested annually. There is a possibility to use the silt of the effluent from the water treatment plants to fertilize these plantations. Such investigations have recently been initiated in other countries, Lithuania e. g.

Experiences from Sweden show that these plants do not exhaust the soil, as they keep the nitrogen in the soil. As experiments by Block (2004) show the usual agricultural machinery and equipment is suitable for harvesting.

Wood and especially fairly unused residues from millings are predestined for energy use in Ukrainian households or in production plants to produce renewable energy at low costs. The costs of using wood for energy production are low in comparison with fossil raw materials like heating oil or gas. Due to high energy efficiency wood offers realistic perspectives in rural areas of Ukraine.

Strategic options for renewable energy in Ukraine

Table 15.5
Gross energy yield per ha

		Biodiesel (rapeseed)	Bioethanol (sugar beet)	Bioethanol (corn)	Bioethanol* (sugar cane)	BtL	Biogas (maize)
Fuel Equivalent		0,91	0,65	0,65	0,65	0,97	1,4
Heating value	MJ/l	33,1	21,17	21,17	21,17	33,45	50
Biomass	t/ha	3	35	4,1	73,8	15 t atro	45
Biofuel	l/t Biomass	401,5	65,1	240,4	88 0	269	79 kg/t
Biofuel	l/ha	1204,4	2280,2	985,7	6494,3	4028	3555 kg/ha
l Fuel Equivalent/ha		1096,0	1482,1	640,7	4221,3	3907	4977
Gross fuel yield	GJ/ha	39 9	48,3	20,9	137,5	135	178

*) Bioethanol produced in Brazil.
Source: Own calculations based on data from FNR and IEA.

Biofuel and bioenergy production clearly offer advantages for the agri-rural sector. However, some disadvantages can be identified as well. The calculations show how important the competitiveness of produced renewable energy is. In Table 15.5 the gross energy yield per ha is compared taking into account different types of biofuel.

It can be concluded that the gross fuel yield from bioethanol produced with corn is relatively low. Bioethanol made of sugar beet involves a higher productivity than biofuel made of rapeseed but best gross fuel yield per ha is to achieve with biogas from maize. These days the discussion about acreage competition for food — and energy-use shows how important the gross energy yield per ha will become. Ukraine has to keep in mind not only the production costs but also to use the acreage as efficient as possible to produce raw products for food- and energy-use.

In Figure 15.7 the gross energy yield from different energy sources is compared. This yield and the related production costs mainly determine the competitiveness of raw materials for energy production.

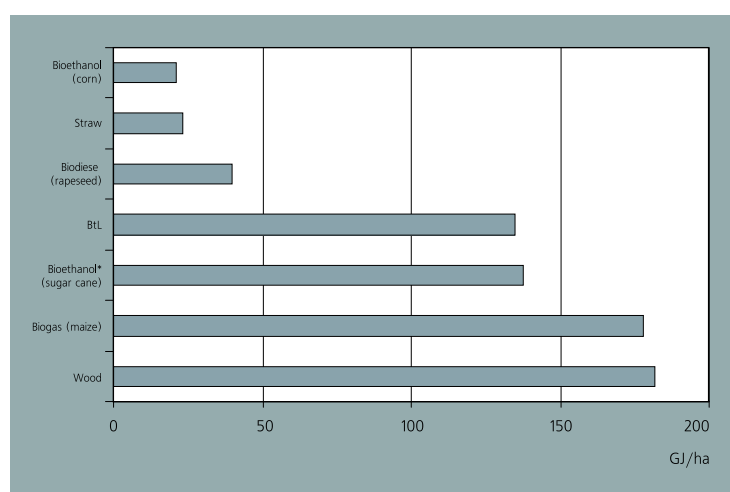


Figure 15.7
Gross energy yield from different energy sources
 *) Bioethanol produced in Brazil.
 Source: Own calculations.

Producing biodiesel on the basis of rapeseed as raw product becomes questionable in Ukraine because of high rapeseed world market prices. Biodiesel production vis-à-vis high commodity cost has never been competitive without subsidies in the past. The better option is to produce rape seed and rape seed oil and sell this on the world market.

Producing bioethanol with corn brings similar results as for biodiesel. Grain is well traded on high world market prices and even in most modern plants bioethanol made of wheat or corn can only be produced if it is subsidised at current price ratios. Hence from economic perspective it is better to produce corn and grain for the world markets.

High production costs for bioethanol production with domestically produced sugar beets makes clear that at current price levels agricultural raw products are too precious for a competitive ethanol production. Sugar cane is a cheaper raw product and hence more competitive.

Biogas production with organic waste from livestock production could provide new opportunities for some agricultural industries and rural areas. Local energy generation with biogas plants can also improve the energy supply of remote areas where imported energy is especially expensive.

Using straw for heating systems is cheaper than using agricultural raw products that are traded on a high-price-level food market. Straw is available in most parts of Ukraine and because of the low production costs suitable for decentralized energy production systems.

Wood produced in short rotation coppice and especially fairly unused wood residues from millings are predestined for energy use in Ukrainian households or in production plants to produce renewable energy at low costs. Due to high energy efficiency wood offers realistic opportunities for rural areas in Ukraine.

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16. Reduction of Green House Gas Emissions in Agriculture

This paper was produced at the end of 2007 to identify the potential of Joint Implementation (JI) Projects according to the Kyoto Protocol in agriculture in Ukraine. Two case studies are presented, whereas the first case shows an investment into a biomass boiler (for sunflower husk burning) and Combined Heat and Power (CHP) plant at a large financially viable agribusiness holding in the edible oil sector. The second case study is a straw-fired biomass boiler at a medium sized agricultural enterprise that sells heat to the neighboring village. It is shown that the biggest obstacles that prevent more emission reduction projects in Ukraine from being realized are lacking funding sources of potential project owners and the limited size of projects in agriculture. In order to allow for funding options in the sector a Green Investment Scheme and the improvement of the national framework conditions are recommended.

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Introduction

The entry into force of the Kyoto Protocol in February 2005, and the start of the Joint Implementation (JI) Mechanism in January 2008, raises expectations and hope for fostering investment in energy production from renewable sources in many countries. The newly created carbon markets are an instrument to add value to a public good through limiting its use for industrialised countries. Agriculture has the potential to deliver multiple ecological benefits to the global society, through soil and water protection, maintenance of landscape and cultural heritage, among others. Agriculture plays a key role for mitigation of climate change impacts, through desertification prevention measures, development of drought resistant species, sustainable food production etc. The effect of agriculture to reduce emissions of greenhouse gases (GHG) under the Kyoto Protocol, however, is limited to date. Although there is an enormous potential of using agricultural residues and primary products for energy production and avoiding emissions from dumping of organic waste, the contribution of emission reductions from agriculture currently counts for 3% worldwide only.

Agriculture and food are important sectors in Ukraine with growing opportunities on international commodity markets driven by increasing demand for food, feed and renewable energy. At the same time Ukraine's dependency of fossil energy leads to the search for new energy supply concepts. Therefore, decentralised energy production and energy saving is on the top policy agenda. So, one would expect that the Kyoto Protocol would provide a fruitful environment to allow for a boom of bioenergy production from agricultural residues in Ukraine. However, among 74 investment projects proposed as JI projects so far, only two are associated to agriculture.

According to national eligibility requirements, a project must result in 20,000 tCO₂e minimum to be eligible as JI project. The technical potential for emission reductions in agriculture at national level is huge, but the projects are characterised by small per project sizes and scattered distribution. Thus, transaction costs for emission reduction projects in agriculture under JI are considered too big; resulting in a competitive disadvantage of these projects compared to emission reduction projects in other sectors. So, in addition to the JI mechanism this paper will discuss use options of a financing scheme that is not officially related to the Kyoto Protocol but is evolving around the discussion of selling government owned emission reduction units: the Green Investment Scheme (GIS).

In a first step, this paper explores the technical potential for emission reduction projects in Ukraine and Eastern Europe and discusses the current pipeline of JI projects by technology type. In a second step, this paper brings some light into the carbon markets under the Kyoto Protocol and the competitive disadvantage of emission reduction projects in agriculture. The third chapter provides further

insights in characteristics of emission reduction projects in agriculture and provides two example projects (one under JI and one under GIS) with good expected replication potential in Ukraine. Last but not least, main barriers are identified and measures to overcome these barriers are proposed.

This paper is meant to discuss issues and options, instead of providing solutions.

GHG Emission Reduction Projects in Ukraine and Europe

GHG emission sources

In order to illustrate the potential leverage of emission reduction projects in agriculture to reduce overall national emissions, a discussion of main emission sources is central. The distribution of emissions by sources in Ukraine depicts the trend in EU member states.

Table 16.1

Sources of GHG emissions

Sector	GHG Emissions in Ukraine				GHG emissions in the EU-27			
	1990		2004		1990		2005	
	mt CO ₂ e	% of total national emissions	mt CO ₂ e	% of total national emissions	mt CO ₂ e	% of total EU emissions	mt CO ₂ e	% of total EU emissions
Energy	687.6	74.30%	2825	68.32%	4320	76.84%	4.131	79.78%
Industrial processes	1281	13.84%	91.4	2.210%	475	8.45%	412	7.96%
Solvent and other product use	0.4	0.04%	0.3	0.07%	13	0.23%	10	0.19%
Agriculture	101.4	10.96%	30.4	7.35%	595	10.58%	476	9.19%
Waste	7.9	0.85%	8.9	2.15%	219	3.90%	149	2.88%
Other	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TOTAL	925.4	100.00%	413.5	100.00%	5622	100.00%	5178	100.00%

Sources: Annual Ukrainian National GHG Inventory 1990—2004, Annual European Community greenhouse gas inventory 1990—2005 and inventory report 2007.

Table 16.1 illustrates that energy production counts for three third of overall GHG emissions in Ukraine and EU—27. In 1990, agriculture ranked third with almost 11% of the total emissions after industrial production processes with slightly more than 13%. In the EU context, emissions from agriculture exceed emissions from industrial processes. This trend is not reflected in data from Ukraine. Instead, emissions from the industrial sector now contribute more than 22% to total national emissions, while the share from agriculture reduced to 7.35%. These changes have to be seen in the light of the sharp decrease of the overall

emissions in Ukraine by more than 50% from 925 mtCO₂e in 1990 to 413 CO₂e in 2004. This reduction is a result of economic recession and the break down of industrial production in Ukraine, which touched upon both, agriculture and industry sectors.

GHG emission reduction potential

According to the national GHG inventories and expert estimations, the theoretical annual emission reduction potential in Ukraine totals 170 mtCO₂e/year (Table 16.2). The largest share (39%) could be contributed from biomass for heat production (58 mtCO₂e/year), whereas the potential for power production is relatively small.

Table 16.2
Technical Potential for Emission Reductions in Ukraine (2005)

Sector	Project Type	Energy production potential		ER potential
		mtce	% of total consumption	mtCO ₂ e
Energy efficiency	Industry: CHP	8.12	4.05	23.39
	Insulation of Houses	1.93	0.96	5.56
	Restoration of DHS	6.12	3.05	17.63
Bioenergy	Biomass for Heat	20.30	10.12	58.46
	Biomass for Power	0.60	0.30	1.73
	Biofuels	2.20	1.10	6.34
Avoided methane emissions	Landfills	0.30	0.15	3.88
	Coal Mines	9.90	4.93	28.50
	Fixing gas pipelines	0.40	0.20	8.30
	Crop waste*	0.00	0.00	0.00
	Manure management*	0.00	0.00	0.00
Renewable energy	Wind	0.70	0.35	2.02
	Solar	0.27	0.13	0.78
	Hydro (small)	1.30	0.65	3.74
	Geothermal	1.09	0.54	3.14
Avoided industrial gases emissions	N ₂ O			6.84
	SF ₆			0
	HFC23			0
TOTAL	53.22	26.53	170.30	

Sources: (1) Geletukha G.G., Dolinsky A.A. Presentation at Third International Conference on Biomass for Energy (18—20 September 2006, Kiev, Ukraine);
 (2) Expert estimate of SEC Biomass;
 (3) Energy Strategy of Ukraine for the Period till 2030;
 (4) Annual National GHG Inventory (1990—2004); * no data available.

Table 16.2 shows that avoiding methane emissions at coal mines has the second largest potential to reduce GHG emissions (28 mtCO₂e/year), followed by energy efficiency measures in the industrial sector (Combined Heat and Power Production) which could potentially lead to a reduction of 20 mtCO₂e/year. Due to a lack of data, Table 16.2 does not provide figures on potential emission reductions from avoided methane emissions in agriculture (e.g. improved manure management and avoided/improved dumping of organic waste). Thus, the overall potential for agriculture is expected to be higher due to the high global warming potential of methane (see Table 16.4).

ER project pipeline in Ukraine

For the time being, the Government of Ukraine does not apply selection criteria for emission reduction projects. Basically all projects that save energy and reduce emissions are accepted. The Energy Strategy of Ukraine foresees an increase of non-traditional and renewable sources for energy production by 3.7 times until 2030 (from 15.51 mtce in 2005 to 57.73 mtce in 2030). This would correspond to a growth of bioenergy production of 700% (from 1.3 mtce in 2005 to 9.2 mtce in 2030). To date, the Ministry of Environmental Protection has issued 74 Letters of Endorsement and 11 projects have obtained Letters of Approval, meaning that these 11 projects will yield ERUs once the national procedure for ERU issuance is in place.

Table 16.3

Projects with LoE and LoA from the Ukrainian Government

Project type	No. of projects	Average size (mtCO ₂ e)	Min. size (mtCO ₂ e)	Max. size (mtCO ₂ e)	Total (mtCO ₂ e)
Projects with Letter of Endorsement (LoE)					
Coal Mine Methane	11	1.89	0.26	8.7	20.83
Energy Efficiency	11	1.25	0.1	8.61	13.72
Waste	18	0.35	0.14	1.24	6.29
District Heating	5	0.52	0.3	0.89	2.62
Biomass	3	0.27	0.22	0.32	0.8
N ₂ O	4	1.85	1.33	2.15	7.4
Cogeneration	12	0.92	0.19	6.09	11.05
Renewables	2	2.23	1.3	3.17	4.47
Other	8	2.29	0.29	8.05	18.29
TOTAL	74				85.47
Projects with Letter of Approval (LoA)					
Coal Mine Methane	3	3.462	0.263	8.705	10.386
Energy Efficiency	3	1.296	0.351	3.1	3.888
Waste	1	0.332	0.332	0.332	0.332
District Heating	3	0.645	0.344	0.887	1.935
Renewables	1	1.3	1.3	1.3	1.3
TOTAL	11				17.841

Source: Ministry of Environmental Protection of Ukraine, Status: Oct. 2007.

Table 16.3 depicts the current pipeline of JI projects in Ukraine. The largest amount of emission reductions comes from coal mine methane projects (20 mtCO₂e until 2012), followed by energy efficiency projects in the industrial sector (13 mtCO₂e until 2012). Of the total 74 projects in the pipeline, three projects are related to agriculture and forestry. Two of them are about utilization of sunflower husk for steam and electricity production at oil extraction plants in Kirovograd and Pology, one is related to the wood processing industry. In total they will reduce 803,000 tCO₂e until 2012. The two renewable energy projects are wind farms. Above figures show that the average size of biomass projects is with app. 270,000 CO₂e significantly lower than the average size of coal mine methane projects (1.9 mtCO₂e) or energy efficiency (1.2mtCO₂e). The small project size leads to relatively high transaction costs per tCO₂e. As a consequence, project developers and buyers of carbon credits tend to cream off the big and easy projects, before looking into the potential of smaller projects.

Among the projects with Letters of Approval there is so far none related to agriculture. The district heating projects foresee switching from fossil coal to fossil gas.

ER project pipeline in all JI countries

This trend described for Ukraine is similarly reflected in all JI countries.²⁰⁹ The current pipeline of all JI projects counts 183 projects that are in advanced planning stage (validation or determination²¹⁰), totalling in a potential volume of 36.6 m ERUs (or mtCO₂e) until 2012.

Figure 16.1.a is based on data for projects in the pipeline in all JI countries. It shows that more than 50% of this volume comes from non-CO₂ gases (CH₄, N₂O, HFCs, PFCs). In terms of number, projects producing renewable energy contribute the largest share (78 out of 183 projects, counting for 42%).

Figure 16.1b provides further insights into the category of renewables that in total contribute 17% of emission reductions in above Figure 16.1a. The largest contribution comes from wind projects, followed by biomass projects and hydro power projects.

Biomass use contributes 32% to expected emission reductions in the renewable energy sector. This corresponds to a contribution of 6% to the total volume of expected emission reductions.

²⁰⁹ JI countries in this pipeline are: Russia, Ukraine, Bulgaria, Czech republic, Romania, Poland, Hungary, Estonia, Latvia, Lithuania, Slovakia, Germany, New Zealand.

²¹⁰ 'Validation' is a third party check of the project by an accredited certification company. 'Determination' refers to the step in the JI project cycle, where the project is presented to the official UN body for the mechanism, the JI Supervisory Committee (JISC).

In real numbers, a total of 19 biomass energy projects are in an advanced planning stage, with a combined expected volume of slightly more than two million ERUs. This results in an average project size of 100,000 ERUs until 2012, and 20,000 ERUs per year (from 2008 to 2012).

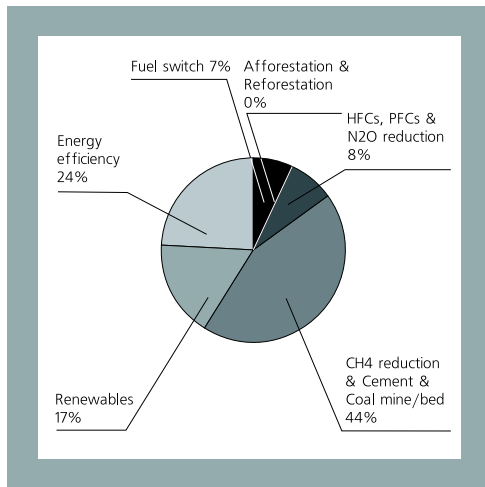


Figure 16.1a
ERUs until 2012 (%) in each category
Source: CD4CDM, JI pipeline, UNEP Risoe Centre, status: 27.08.07.

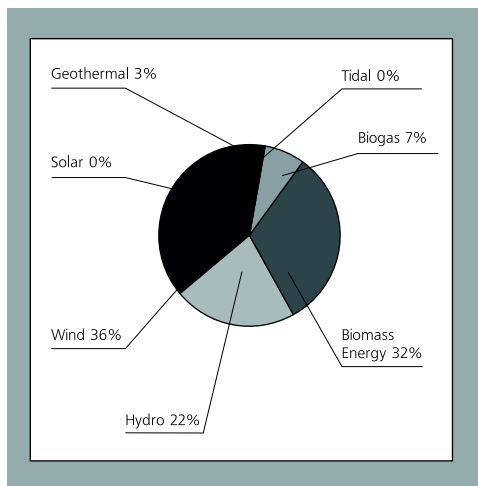


Figure 16.1b
ERUs until 2012 (%) from renewables by technology
Source: CD4CDM, JI pipeline, UNEP Risoe Centre, status: 27.08.07.

The cost of emission reduction

Although the enormous potential of bioenergy projects is evident, these projects currently don't get off the ground. One major reason for that are the comparatively high carbon abatement costs of bioenergy projects. This partly lies in the nature of green house gases. Carbon dioxide is less harmful to the atmosphere

than other gases. Avoiding one ton of Hydrofluorcarbons (HFC 23 is a by-product from HCFC 22 production. HCFC 22 is a cooling liquid in air conditions and fridges) is equivalent to avoiding app. 10,000 t of CO₂. HFC 23 emissions can be avoided through filtering or burning the emission gas at high temperatures. This process costs less than 1€/tCO₂e. Instead, avoiding one ton of carbon through a bioenergy project will likely lead to abatement costs between 20 and 50 €/tCO₂e (Mc Kinsey, 2007). Table 16.4 depicts the Global Warming Potential of the gases treated under the Kyoto Protocol.

Table 16.4
The Global Warming Potential (GWP) of Greenhouse Gases

Greenhouse gas		GWP
CO ₂	Carbon dioxide	1
CH ₄	Methane	21
N ₂ O	Nitrous oxide	310
HFCs	Hydrofluorocarbons	140 - 11.700
PFCs	Perfluorocarbons	6.500 - 9.200
SF ₆	Sulfur hexafluoride	23.900

Source: First Climate Group.

The Carbon Market in Central and Eastern Europe— a short overview

Carbon credit units

The carbon market is a general term meaning transactions of different carbon units (all of them being equal to one metric tone of carbon dioxide) on three markets:

- 1) EU internal: Governments and private companies within the EU—15 trade EUAs (within the framework of the EU—ETS²¹¹).
- 2) Inter Governmental: Governments from economies in transition with surplus AAUs can sell AAUs to other Governments.
- 3) National project to international government or private company: Project owners of emission reduction projects can sell the emission reductions as ERUs to governments or private companies.²¹²

Every unit is equal to one metric ton of carbon dioxide, but prices for the units are different. A discussion of prices and price drivers for the different commodi-

²¹¹ The EU-ETS is the European Emissions Trading Scheme, set up according to article 17 of the Kyoto Protocol.

²¹² Some countries allow for unilateral projects, these are projects where seller and buyer are from the same country. However, to date not such unilateral project is being observed.

ties would clearly exceed the purpose of this paper. Buyers and sellers in the JI world often use the EU internal EUA price as index for ERU prices. ERU prices in a flexible price scenario consist of a fixed floor price plus a flexible price indexed to the EUA. In the EU—ETS, EUAs are valid for certain years.



Figure 16.2a

Daily EUA price index

Source: ECX Status: 05.12.2008, cited in 3C Marktreport, 02.10.2007, internal publication, 3C Markets AG.

Figure 16.2a shows EUA daily price indexes for the period January 2006 to September 2007, as noted by the London based European Climate Exchange (ECX). In the beginning of 2006, the market was bullish showing increasing prices until April 26th. That day, a report of the European Commission became public by accident, providing figures showing an over allocation of EUAs for the year 2007. EUA prices dropped sharply, of which the price for EUAs for 2007 (Dec07) not recovered and continued to lose value. EUA prices for 2008 (Dec08) and 2009 (Dec09) went down to a minimum of 13.50 € early this year, climbed again to the 20€ benchmark and are currently being traded at slightly above 21€ at the moment. Power, carbon and gas are the main commodities affecting EUA prices. Information about EUA prices can be obtained at European stock markets (e.g. Nordpool, Powernext, EXC, for websites see Annex 1).

Since no AAU transaction took place so far, no prices can be reported. However, prices are expected to be lower than for ERUs due to the enormous over supply.

ERU prices are negotiated between the seller and the buyer. Main price drivers for ERUs are:

- ✓ Size of the project (amount of ERUs).

- ✓ Payment schedule for ERUs (advance payment necessary?).
- ✓ Country risk (any changes in tax and property regulation etc.?).
- ✓ JI related risk (e.g. will the project receive a Letter of Approval from the Government?).
- ✓ Project specific risk (technology risk, financial risk, counterparty risk, environmental risk).
- ✓ Contracting risk (how many counterparties are involved? Are there conflicts of interest?).

In the evaluation report of the carbon markets in 2006, the World Bank reported prices for ERUs to range between 4 to 10 US\$/ERU (State and trends of the carbon markets, 2006, IETA and WB, 2006).

Carbon credit buyers

Buyers of carbon credits can be governmental procurement vehicles (e.g. governmental carbon funds), mixed public/private funds or private companies (e.g. commercial funds, foreign power utilities etc.) from an industrialised country.

Carbon credit sellers

The sellers of carbon credits can be private or state-owned companies or organisations who own a project that reduces emissions. This can be a municipality that owns a district heating system and aims to install a biomass boiler, or a medium size private agricultural enterprise that invests in biogas production and utilisation or a large power utility that installs a turbine to use waste heat of power production and increase energy efficiency.

Institutional framework for carbon markets in Ukraine

The Supreme Council of Ukraine ratified the Kyoto Protocol (KP) on February 4th, 2004. Since then, a number of Laws and Decrees were ratified to steer implementation of KP mechanism. :

1. The Ministry of Environmental Protection of Ukraine (MEPU) is the so-called "Designated Focal Point" according to JI terminology. The MEPU is authorized by the national Government and the UNFCCC to coordinate all Kyoto related activities in Ukraine.
2. The National Environmental Investment Agency of Ukraine that was created on April 4th 2007.

The carbon market in countries in transition (including Ukraine) allows for two types of institutional set-ups for carbon transactions: (i) the project based Joint Implementation mechanism as defined in article 6 of the Kyoto Protocol, and (ii)

the Green Investment Scheme that is a voluntary framework that is being discussed for selling state-owned emission reduction certificates.

In Ukraine, the Joint Implementation mechanism is managed by the Ministry of Environment through the Department for the Support of the Kyoto Protocol Implementation and Regulation of Ozone depleting. The Ministry of Environment is the key authority to deal with all UN related issues and the Kyoto Protocol, having a legal basis on resolution No. 206, 273, 341 and order No. 342. Projects that are seeking to generate incomes through carbon credit sales, submit relevant project documentation to the Department. In a first assessment, the agency approves projects through submitting Letters of Endorsement (LoE). After this, projects may apply for Letters of Approval (LoA), which is then equal to a guarantee of the government that the project will be allocated the required amount of emission reductions (in form of AAUs) for selling ERUs.

Main actors in Joint Implementation (JI) projects are:

Box 1

AAUs - Assigned Amount Units

With the ratification of the Kyoto Protocol, industrialised countries have agreed to reduce their GHG emissions. The emission rights are capped for industrialised countries and economies in transition according to emissions in the base year 1990. These capped emission rights are defined as assigned amount units. Due to the economic contraction in Ukraine after 1990, GHG emissions these days are less compared to 1990. Ukraine has a surplus of AAUs that they can sell to other industrialised countries in need of additional emission rights. Estimations of the Ministry of Economy of Ukraine project a total of 2.225 billion surplus AAUs, of which 200 mio AAUs per year shall be used for GIS, 50 mio AAUs per year shall be used for JI and the remaining amount shall be held as a reserve.

- ✓ Project owner (e.g. the municipality owning a district heating system/a private company owning a factory).
- ✓ Project developer (a consulting company that supports the project owner in developing JI related documentation and obtaining relevant national approvals).
- ✓ Ukrainian Government through the Ministry of Environmental Protection, Department for the Support of the Kyoto Protocol Implementation and Regulation of Ozone-depleting.
- ✓ Buyer of carbon credits.

In the JI mechanism, emission reductions of each project are approved by the national Government, which then puts aside the equivalent amount of AAUs. This setting aside of AAUs converts the project owned emission reductions from state to private property and turns them to the unit ERU (Emission Reduction Unit) which is tradable between the project owner and the carbon buyer. A future contract is closed for the delivery of ERUs between the project owner and the buyer.

The Green Investment Scheme (GIS) has a different origin than the JI mechanism. The GIS is no instrument of the Kyoto Protocol. It is a voluntary commitment of the national government of Ukraine to dedicate the incomes from sales of state-owned emission reduction certificates (AAUs) to national emission reduction projects. Since the surplus amount of AAUs is a by-product of the economic collapse but not a result of good environmental policy, international actors strongly emphasize to link AAU sells to investments in clean energy sources in the own country. Due to the enormous supply of AAUs from Russia and Ukraine, particularly, it is expected that the demand side will focus on so-called "greened" AAUs. So, "greening" AAUs through a GIS is the most promising way for Ukraine to sell AAUs.²¹⁴ There is no official procedure on how to implement a GIS. Instead, it is to the Governments to design a scheme that fits in the national strategic plan and budget allocation. Since the demand for AAUs comes from other Governments (or public funds representing a number of Governments, like the Prototype Carbon Fund of the World Bank), it is likely that these Governments will want to be involved in the selection of project types eligible under a GIS financed from the revenues of their expenditure. It is not yet clear, which Governments will purchase AAUs and what criteria they wish to apply. This will all be a matter of negotiation between the Ukrainian and the foreign Government.²¹⁵

On April 4th, 2007, The Prime Minister of Ukraine approved a decree of the Cabinet of Ministers of Ukraine to establish the National Agency of Environmental Investment of Ukraine.²¹⁶ This Agency has been immediately established and is now responsible for AAU trading. Rules and procedures for set-up and operation of The Green Investment Scheme are currently being discussed. The Agency is mandated to prepare a law on International Emissions Trading and to submit it for approval during the parliamentary session in autumn.

Main actors in GIS projects would be:

- ✓ Project owner,
- ✓ Project developer,
- ✓ Ukrainian Government through the Agency of Environmental Investment.

According to recommendations of the World Bank²¹⁷), a GIS could be designed

²¹⁴ The Hungarian Government just announced to have their Green Investment Scheme ready by January 2008. In order to assure the quality of projects financed through the GIS, the Government considers to use ISO 14064-3 standard for emission reduction verification (<http://www.pointcarbon.com/article24779-472.html?articleID=24779&categoryID=472>, 02.10.2007).

²¹⁵ E.g. the German Government has the objective to comply with emission reduction obligations under the Kyoto Protocol mainly through national measures. Only a small share is expected to be contributed under JI and no interest so far has been shown to engage in a GIS.

²¹⁶ Resolution of The Cabinet of Ministers of Ukraine №612 April 4, 2007, on establishing the National Agency for Environmental Investment.

as a targeted program in the Special Fund of the Ukrainian budget. This is reported to be in line with fiscal policy and would add to transparency in fund flows. It is reported that the Head of the Agency for Environmental Investments, plans to design a potential program under a GIS similar to a credit line that provides long-term loans. The idea is to avoid mere distribution of money (similar to a subsidy) and instead create a sense of ownership for the project and incentive to maintain the infrastructure in a well state in order to pay the credit back. However, conditions of this credit line are not defined yet. So, it's applicability to the bioenergy sector remains unclear.

Potential Emission Reduction Projects in Agriculture

Technical potential and implementation obstacles

According to Kyoto Protocol definitions, project types in agriculture can be divided in two types: (a) fuel-switch projects that replace fossil fuel through fuel from a renewable source, (b) avoided emissions projects that do not produce energy but avoid emissions of greenhouse gases that would have occurred without the project. A combination of both types is possible, e.g. avoided dumping of wood waste from timber processing (sawdust) in open piles (avoided methane emissions) plus burning the wood waste in biomass boilers and replacing fossil fuel. The following project types are identified to be relevant for agriculture in Ukraine:

- ✓ Heat (and power) production with biomass boilers (sunflower husk, straw, wood).
- ✓ Heat and power production from biogas (at cattle and pig farms).
- ✓ Reducing methane emissions (improved manure management, controlled treatment of organic waste from food processing industries, meat production).
- ✓ Biofuel production (bioethanol, biodiesel, second generation fuels, energy crops).

Starting with the latter, biofuel projects under the Kyoto Protocol are not efficient, both cost and emission wise. Several authors have shown that biodiesel and bioethanol production in Ukraine is not yet competitive without substantial subsidies (IER 2006, IER 2007a). Revenues from carbon sales will not be enough to fill this financing gap, due to the relatively small emission reductions produced by such project. One litre of biodiesel (from rapeseed) replaces only 0.5l of fossil diesel and one litre of bioethanol (from sugar beet) replaces 0.6l of fossil diesel (OECD 2007). Under the JI Mechanism it is a precondition that the biofuel produced is used in the country of it's origin. If the project foresees to export the

²¹⁷ Ukraine, Options for designing a Green Investment Scheme under the Kyoto Protocol, Nov. 2006.

biodiesel, no revenues from carbon credit sales will occur. Due to low in-country prices for mineral diesel (0.63 €/liter in November 2007), biodiesel production for the national market is not yet considered by national investors. Second Generation Fuels are expected to be a cost-efficient alternative in the future, but the technology is not yet sufficiently developed. Growing and utilisation of energy crops (poplar, willow, miscanthus etc.) may be a good option in the future but are not yet in the pipeline in Ukraine.

Methane emissions occur when organic material decomposes under anaerobic conditions, e.g. in solid biomass piles or open lagoons (manure, sewage water from food-processing plants etc.). Solid biomass (sawdust, bark, organic household waste etc.) can be burnt or composted under aerobic conditions, both leads to avoided methane emissions (but carbon emissions, which have a smaller GWP potential).

Liquid biomass can be used in biogas systems to produce heat and/or power and replace fossil fuel. The size of the system and energy needs of the plant determine the suitable technology. An optimal biogas project under JI combines both carbon components: (1) replacement of fossil fuels and (2) avoiding methane emission from manure decomposition in open lagoons. Due to the high GWP potential of methane (21 times higher than carbon dioxide), the carbon component of avoided methane emissions is by far larger than the carbon component of replacing fossil fuel through producing heat and power from biogas. Since open lagoons for manure are not always common practice in Ukraine, carbon credits can often not be counted for avoided emissions. Under JI, average biogas projects in agricultural enterprises are rather small with max. 15,000 tCO₂e/year (Table 3.1). Thus, bundling of 5 to 10 projects in a portfolio would be needed to make this project interesting to carbon credit buyers (most buyers have a threshold of a minimum production of 50,000 tCO₂e/year, in order to keep transaction costs per project low). A farm with 20,000 heads of livestock could be suitable to form a single JI project, but these farms are limited in Ukraine. According to experts' estimates, app. 600 average sized cattle farms have the potential to install biogas plants and app. 90 pig farms (SEC Biomass, expert estimate, Oct. 2007). Larger biogas projects are associated to gas extractions at landfills or sewage water treatment plants.

Ukraine is a large producer of sunflower oil. In 2006, total annual oil production was 1.6m t. Sunflower husk is a by-product of oil production that can be used in biomass boilers or for co-firing. To date it is common practice to dispose the husk on landfills. To date, only a few plants have installed husk fired boilers for heat production and one plant plans to implement a CHP unit. Sunflower husk boilers or CHP plants operating on husk are a promising option for JI projects in the sector. As shown in Table 1.3, the average size of a JI project in the fat and oil sector

can be estimated at 30 MWth with app. 50,000 t CO₂e/year. Expert estimates indicate that there is a potential for app. 20 projects of this size in Ukraine.²¹⁸

Table 16.5
Characteristics of average ER projects in the agricultural sector in Ukraine

Technology	Installed capacity (MW)	Capital requirements (m€)	ER potential (tCO ₂ e/yr)	Project IRR (%)	Payback period (years)
Sunflower husk fired boilers	30	6	50,000	15	5
Wood fired boilers	13	4	23,000	30	3.2
Straw fired boilers	0.6	0.61	575	43	2.2
Biogas production/cattle farm	0.35	1.2	15,000	19	4.5
Biogas production/pig farm	0.16	0.55	7,500	19	4.6
Improved manure management (aerobic treatment)	0	1.5	1,000	n.d.	n.d.
Improved manure management (combustion of chicken litter)	25	50	50,000	n.d.	n.d.

Source: Expert estimate of SEC Biomass, n.d. — no data.

Another promising project type is the introduction of straw fired boilers. Estimates show that app. 5.6 mtce are annually could be obtained from surplus straw. Boilers with an installed capacity of 100—300 kW are suitable for agricultural enterprises and farms with average heat demand. For heating public buildings in the rural area, an installed capacity of 300—1,000 kW is required. Again, Table 16.5 shows that the implementation of one boiler is with app. 575 t CO₂e/year far too small to serve as single JI project. In this case a portfolio of up to 50 small projects is required. It is estimated that in total there is a potential for 5,000 straw-fired boilers in Ukraine (SEC Biomass, expert estimate, Oct. 2007).

Wood residues serve as fuel for biomass boilers as well. The average boiler size would be 13 MWth with app. 23,000 t CO₂e/year. A combination of two boilers

²¹⁸ SEC Biomass, expert estimate, Oct. 2007.

could lead to volumes that are interesting for carbon credit buyers. For this project type, financing clearly would have to come from the biomass owner (e.g. sawmill).

With regards to improved manure management, two types of projects are possible: (1) aerobic treatment (composting) and (2) combustion of chicken litter. Projects on aerobic treatment are rather small and to constitute a single JI project a portfolio of 40—50 projects are required. Chicken litter combustion is a very expensive technology with 50m € investment costs, thus experts consider this technology not competitive in Ukraine. Still, there is one project being planned (large-scale enterprise “Myronovskiy Khiboproduct”) where it seems to be economically viable.

Case Studies

In order to provide further insights in two project types that have good replication potential in Ukraine the following two chapters discuss two selected case studies. The first case study shows an investment into a biomass boiler and CHP plant at a large financially viable enterprise. This project is expected to produce app. 40,000 tCO₂e annually and is sufficiently large to attract foreign buyers of carbon credits under the JI mechanism. The second case study is a biomass boiler at a medium sized agricultural enterprise that sells heat to the neighbouring village. This project produces a very small amount of emission reductions (575 tCO₂e annually), which makes it less interesting for foreign carbon credit buyers and more interesting under a Governmental Green Investment Scheme (GIS).

Case Study 1: Sunflower husk fired boilers under JI

The example project is being implemented at an edible oil plant, which is owned by an Open Joint Stock Company (OJSC). The company is one of the leading edible oil producing companies in Ukraine and belongs to a bigger holding company. The plant has a comprehensive infrastructure of pre-treatment, hulling and winnowing, pressing, extraction and auxiliary division. The plant was modernized and partly reconstructed during the past years. As a result of these measures, the company increased its production capacities, including all parts of the production process — from storage to processing capacities.

The objective of the project is to redesign the energy supply system of the oil plant so that 100% of the sunflower seed husks are used for heat and power production. The company calculates with an extension of the production capacity, which will lead to increasing heat and power demand. The purpose is to supply heat and power to the enterprise at the expense of husk combustion, to reduce dependency on fossil fuel and avoid purchasing power from grid, and to avoid dumping of husk at landfills.

Box 2**Key features – case study 1**

- Installed capacity: 30 MWth + 2.5 MWe
- Capital requirements: investment 6 m Euro, operational costs 118 t Euro/yr, JI development 25 t Euro
- Heat output per year (GWh/year): 180
- Power output per year (GWh/year): 12
- Amount of natural gas replaced (mio m³/year): 14
- Grid emission factor (tCO₂/MWh): 0.896
- Emission reductions from fuel switch (ERUs): 25,000 tCO₂e/yr
- Emission reductions from avoided methane emissions (ERUs): 16,000 tCO₂e/yr
- Buyer of heat output: CHP plant sells heat to the company
- Buyer of electricity output: CHP plant sells heat to the company
- Additional revenue of the project: none
- Fuel supply: 52 t sunflower husks/yr
- Annual operating time (hours/ year): 8,000

Input supply

Core business of the company is to process sunflower seeds and produce edible oil. The company is one of the leading edible oil producers in Ukraine, thus input supply is considered stable and permanent.

Income streams

The JI project has two income streams: (a) the revenue of carbon credits (ERUs), and (b) income of the CHP from heat and power sales to the oil production plant (except from losses and own consumption).

Ownership of the project:

The CHP plant is owned by the holding.

Project Finance:

Share financed through equity: 76%

Share financed through debt: 0%

Share financed through JI: 24%

Stakeholders involved in the project are the Holding and the oil production company. The Holding covers 100% of the investment costs with own equity. The ERU income stream will be used for covering operational costs and debt repayment. This will lead to a payback period of 5 years.

This project has a low risk profile. Input supply is secure and the project produces two asset streams. The contractual set-up, with the Holding as owner of the JI project and the oil processing plant as client of the JI project is quite unique. The interest of the Holding is to increase oil production, whereas a steam based process is a means to increase oil extraction efficiency. This structure assures a high sense of ownership of the Holding for both enterprises, whereas it creates

semi-market conditions where the CHP plant has to compete with conventional heat and power prices.

As JI project this is a perfect set-up where no upfront payments of the certificates are needed since investment costs are covered by the Holding.

Straw fired boilers financed under GIS

The owner of the project is a private agricultural enterprise specialized in cereal production. The purpose of the project is to switch natural gas based heating systems to straw based heat production. For the purpose a 600 kW straw fired boiler is planned to be installed. Produced heat will be used for own needs of the enterprise and for heating social and other objects of the neighbouring village (school, kindergarten, administrative buildings).

Box 3

Key features – case study 2

- Installed capacity (MW net energy output): 0.6 MW
- Capital requirements: investment costs 61,000 €, operational costs 12,500 €/yr, development for JI or GIS financing 11,000 €
- Heat output per year (GWh/year): 2.58
- Amount of natural gas replaced (th. m³/year): 293
- Emission reductions from fuel switch (ERUs): 575 tCO₂e/year
- Buyer of heat output: neighbouring village
- Additional revenue of the project: ---
- Fuel supply: 746 tonnes of straw/year
- Annual operating time (hours/year): 4,000

Input supply

The agricultural enterprise is financially viable and shows a stable production throughout the last years. Annual straw production totals 3,200—3,600 tonnes. App. 2,000 tonnes are used for livestock production, leaving an annual surplus of 1,500 tonnes. This unused straw surplus is twice as much as what is needed to run the boiler at full load. Thus, input supply is considered to be stable and safe.

Income streams

The project draws on two income streams:

1. Heat sales to the village (paid by local administration).
2. Sale of carbon credits.

Additionally, the company has fewer expenses for natural gas, which adds to the positive financing balance.

Ownership and operation of the project

The contracting set-up is straight forward. The agricultural enterprise owns and operates the boiler. A sales contract between the farm enterprise and the local administration about the heat sales is in place.

Project Finance

Share financed through equity: 100%

Share financed through debt: 0%

Share financed through carbon credits: 0%

The project owner covers 100% of the investment costs. Incomes from carbon credit sales are expected to cover 38% of the project costs, which will be used to cover operational costs and debt repayment. The payback period of this investment is 2.2 years.

This case study is an example, where the agricultural company is capable to do 100% financing of the project. However, this is an exception rather than a common set-up. In Ukraine, small and medium sized agricultural enterprises have limited financial capacity which does usually not allow for such an investment in addition to their agricultural activities requiring considerable pre-financing. In order to make use of the technical replication potential of this project type a credit line from local banks allowing for loan durations of 3 years is required.

This project type has a high risk profile under the JI mechanism. For a JI project it is by far too small with app. 500 tCO₂e year. Ten of these projects would have to be bundled to reach an interesting size for a foreign buyer of carbon credits. Project bundles of this size increase risk perception from a buyer's perspectives. If too many stakeholders are involved, the project becomes too complex and too difficult to handle. A number of contracts would have to be in place with several private and public actors. Performance would have to be checked at each site which would lead to high transaction costs. Finally the return per project from carbon credit sales will most likely not be interesting enough to allow for a willingness to cooperate within a bundle of 10 projects.

Two main obstacles hamper the replication of this project type at larger scale: (i) heat producer and heat consumer are not the same entity. The farm enterprise (often private) owns the straw but has limited heating needs, whereas municipalities have large heat demand and run a pipe network but don't own biomass. This would require a contracting set-up that is not yet very common in Ukraine, (ii) Communal administrations as state entities are not eligible to receive bank loans and farm enterprises are not considered credit worthy due to lacking collaterals and credit history. With lacking funding options for the project at both

sides, contractual hurdles between state and private enterprises can not be overcome.

Thus, a national program as buyer of the carbon credits would be an optimal set-up for this case, where the investment is relatively small and the emission reduction volume below 20,000 tCO₂e annually. A Green Investment Scheme could provide a framework for a credit line managed by the Government, allowing for small credit sizes and pay back periods of 2 to 4 years.

Main Obstacles

Financing Needs and Creditworthiness

The biggest obstacles that prevent more emission reduction projects in Ukraine from being realised are lacking funding sources of potential project owners. Carbon co-finance is not the overall remedy to secure investments in a field where Ukrainian entities themselves do not invest. The returns from carbon credit sales occur when the project is running and producing emission reductions. So, they help to cover operational costs and assure smooth debt repayment. But the largest hurdle has to be overcome prior to the project with the financial closure of the project.

In a normal set-up, carbon credit returns are not suitable for covering investment costs. Buyers of carbon credits would provide a certain amount of up-front payment which could add to financial closure. Still, to provide upfront payments, buyers act as every debt provider would act: they ask for bank guarantees or other collaterals. But, access to bank guarantees and loans for agricultural enterprises is limited if not lacking since land or other assets of the enterprise can not be used as collateral. Municipalities are legally not allowed to use their property (e.g. parts of the existing district heating infrastructure) as collateral for loans.

An international carbon buyer would not be willing to provide upfront payment to an agricultural enterprise, if this enterprise is not considered credit worthy by local institutions.

Accordingly, under the current framework conditions, international carbon buyers will focus on large projects at large enterprises with sound financial standing.

Funding sources from international banks are lacking. In 2007, the EBRD launched a credit line with total volume 120 m US\$ for energy efficiency and energy saving projects in Ukraine. However, there is no agricultural project in the pipeline so far. Loans are given under the conditions of commercial loans with a minimum size of app. 500,000 US\$, whereas the loan duration is reported to be longer than the ones offered by national banks. However, this loan size is too

large for most agricultural projects. Although the German Bank West LB shows a good track record in Ukraine, they do not have any agricultural project in their pipeline to date. Main reasons for this are too small loan sizes and difficult contracting set-ups for bundled projects.

National banks provide loans under commercial conditions looking at hard security and fixed assets, which can often not be offered by agricultural enterprises.

Complexity of the topic and awareness creation

Stakeholders in this sector often lack knowledge about carbon-finance options. Due to the scattered business structure, with many small and medium sized farms distributed over the whole country, awareness raising and capacity building is extremely difficult.

In the agribusiness sector, scepticism and lack of information regarding carbon co-financing in the top management level is common.

High transaction costs

For project owners in the country, JI projects come together with new contractual set-ups and arrangements that they are not familiar with. It is very common that the companies are not willing to take the transaction costs of informing themselves on the options and the market and arrange for JI project development.

Carbon buyers face the transaction costs related to the due diligence of the project, complex contracting set-ups and supervision of contract implementation. These costs make buyers reluctant to enter into agreements where too many stakeholders are involved and where the contracted emission reduction volume is too low.

National framework conditions

Several technical and institutional barriers exist in Ukraine effecting agricultural projects, particularly.

- 1) Ecological legislation is weak or hardly enforced so that positive ecological benefits of bioenergetic use of biomass and organic waste can not be factored in (e.g avoided fines for uncontrolled disposal of organic waste, production of organic fertilizer).
- 2) The country went through a period of political instability so that the country risk perceived by buyers of carbon credits and potential investors in bioenergy projects from abroad is perceived very high.
- 3) National technology providers are scarce or missing, leading to high equipment costs.
- 4) A feed-in tariff for producers of power from renewable sources is missing.

For small power producers, the tariff is calculated at full costs whereas big power producers are usually calculating differently. The power distribution company at Oblast level chooses from which source to purchase power. Factoring in all production costs, small producers end up with higher power prices than large power producers that do not fully account for production costs at local level. Thus, without a feed-in tariff, small bioenergy producers are discriminated and will not be able to compete with large power producers using their power of monopoly.

Conclusions

The two funding options presented in the case studies (JI vs. GIS), should serve to illustrate characteristics and strength of the two mechanisms. However, this paper does not emphasize to draw a strict division between both funding streams. Instead applicability should be assessed on a project by project basis.

Despite existing problems, positive trends can already be noted. The banking sector is rapidly evolving in Ukraine, with new credit lines being offered. A national fund for innovation and energy conservation projects was created in Ukraine not long ago.

In 2008, a governmental program is expected to raise app. UAH 1 billion to provide grants to oblast administrations for reconstruction of oblast district heating systems. This could lead to investments in hundreds of straw-fired boilers, which could benefit from carbon co-financing.

A law for a "green" tariff has been proposed and is currently under revision in the Verkhovna Rada and passed in the first reading. The law aimed at factoring in costs of gas cleaning stations in the power prices. This would lead to higher prices for conventional power and result in a doubling of feed-in prices for small producers. However, this law still has to go through the 2nd and 3rd reading and experts state that the initial approach of this law is already being watered. The final outcome will most likely not result in a law that provides an incentive for small power producers to take over ground.

However, a green tariff is considered a core step towards achieving the policy goal to create an equal-level playing field for all energy providers. Accordingly, it is highly recommended to maintain the discussion of calculating a fair tariff for small producers.

In addition, further application of laws on environmental protection and imposing fines for environmental pollution would contribute to create a favourable environment for clean energies and foster the market for organic fertilizer.

Improving the business environment for the domestic manufacturing sector for

biogas equipment and biomass boilers would lead to reduced investment costs for such projects on the long run.

However, all these measures are not likely to be effective unless the price for fossil fuel is not adjusted, factoring in all costs related to its production.

Set-up of a Green Investment Scheme

The carbon market is just starting and several procedures and rules are still being designed. Thus, proactive engagement in the discussions at national level is necessary to assure the representation of the agricultural sector in the design of national programs.

Current discussions on the GIS at national level in Ukraine are directed towards using this mechanism to allow for projects that are not eligible under the JI (e.g. due to weak additionality²¹⁹). This would foster the development of large projects in the industrial sector leading to exclusion of most biomass projects. Under this scenario, the agricultural sector would only marginally benefit. It can be expected that the international Government buying so called "greened" AAUs from a GIS will pose some criteria on the scheme (to reflect their policies for international cooperation with Ukraine and their negotiation status under the Kyoto Protocol). Thus, most likely, the Ukrainian Government might face difficulties marketing a GIS stream that does not reflect international Kyoto market standards.

In contrast, biomass projects are likely to attract interest from international Governments under a GIS. It is highly recommended that the Ministry of Agriculture contributes to the discussion around the design of a GIS with the Agency of Environmental Investments under the Cabinet of Ministers. In parallel to the discussions at national level, discussions should be started with foreign governments to promote a potential program under a GIS for agriculture.

A micro credit program could be suitably set up for a GIS program for municipalities and small and medium enterprises. Applicable collaterals for loan application could be defined under a communal investment program to assure credit access for communes. Since needed investment volumes are relatively small, the minimum loan size of such a program should be around 60,000€.

²¹⁹ "Additionality" is a Kyoto related concept to assure that emission reductions produced by the project provide an incentive to implement the project. Meaning that without the cash inflow from emission reduction sales, the project would not be financially viable. This concept is designed to assure technology transfer and to avoid that Kyoto mechanisms provide hidden subsidies for sectors that already do have access to capital.

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