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Abbreviations

€ Euro
b€ Billion Euro
bUAH Billion Ukrainian Hryvnia
bUS$ Billion United States Dollar
AMS Aggregate Measure of Support
BSC Balance Scorecard
CAE Collective Agricultural Enterprises
CAP Common Agricultural Policy
DEA Data Envelopment Analysis
DEM Dependent Economic Model
dt. 100 kilograms (one-tenth of a tonne)
DUAP German-Ukrainian Agricultural Project
EU European Union
FAT Fixed Agricultural Tax
GDP Gross Domestic Product
ha. Hectare
MAP Ministry of Agricultural Policy of Ukraine
mill. Million
mill. tonnes Million tonnes
MPS Market and Price Support
MRT Mid-Term Review
mUAH Million Ukrainian Hryvnia
mUS$ Million United States Dollar
OECD Organisation of Economic Cooperation and Development
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<td>SPS</td>
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<td>TFP</td>
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<td>UAH</td>
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<td>UEPLAC</td>
<td>Ukrainian-European Policy and legal Advice Centre</td>
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<td>URAA</td>
<td>Uruguay Round Agreement on Agriculture</td>
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<td>VAT</td>
<td>Value Added Tax</td>
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<td>WTO</td>
<td>World Trade Organisation</td>
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Introduction

1 Advances and setbacks

Ukrainian agriculture is showing clear signs of recovery from its ‘transition crisis’. It is well known that agriculture went through such a crisis in all Central and Eastern European countries following the onset of transition. It is also well known that the depth and duration of this crisis – marked by declining production and productivity – differed considerably from country to country in the region, and that Ukraine’s record is comparatively poor in this regard. What is increasingly clear is that these differences in the depth and duration of crisis can be linked to differences in the resolve with which policy makers have introduced and implemented reforms. ROZELLE & SWINNEN (2004, p. 448), in a comparative survey of failures and successes in agricultural transition, conclude that: “All countries that are growing steadily a decade or more after their initial reforms have managed (a) to create macroeconomic stability, (b) to reform property rights, (c) to harden budget constraints, and (d) to create institutions that facilitate exchange and develop an environment within which contracts can be enforced and new firms can enter.”

In all of these areas, and especially in the first two, Ukraine has achieved notable success since late 1999, and agriculture has benefited along with the rest of the economy. What we see, therefore, are signs of a certain ‘normalisation’ in the Ukrainian farm sector. Signs of this normalisation include the emergence of land markets, and the fact that production decisions are increasingly being made by private firms on a commercial basis subject to the usual rewards and sanctions that are provided by the market mechanism. As a result of this normalisation, productivity is increasing, albeit slowly and unevenly across farms, regions and types of production.

These signs of normalisation and recovery are no grounds for complacency, however. Agriculture’s capital base in Ukraine continues to decline overall, despite the significant progress made by a subset of the country’s farms. Management skills and know-how continue to lag far behind the levels that will be necessary to tap Ukraine’s great potential in agricultural productivity and to compete on world markets.

Policy has not responded to all of these concerns, and where it has, it has sometimes responded with inappropriate tools. As regards the policy response to lagging management skills and know-how, for example, investment in research, education and extension continues to be grossly insufficient. As regards the declining capital base, some policy responses such as interest rates subsidies for commercial loans to agriculture have provided assistance that is compatible with market incentives. Other responses, however – such as the long list of attempts to support the production and use of domestic farm machinery – have instead been a burden to agriculture and the taxpayer, and have slowed recovery. As the policy responses to the poor harvest in 2003 demonstrate, many reflexes and urges of central planning continue to lurk below a thin surface of market rhetoric in policy-making circles. Another problem is that policies directed at the farm sector and rural areas lack overall coherence. On the one hand, farmers are supported through tax breaks, minimum prices, and import tariffs. On the other hand, farmers are implicitly taxed by bureaucratic interference and insufficient liberalisation and investment in marketing and transport infrastructure. They must also bear explicit taxes such as the oilseed export tax that cost producers millions of Hryvnia every year.
The overall picture, therefore, is one of a positive trend and clear progress in important areas of Ukrainian agricultural policy. The future success of agriculture in Ukraine will depend on whether policy makers succeed in making progress in the areas that continue to lag, and in avoiding backsliding in the others.

2 The structure of this book

This is the third book that the German Advisory Group has produced on agricultural policy in Ukraine, and the second that has been produced in conjunction with the Institute for Economic Research and Policy Consulting (IER) in Kiev. This book, therefore, picks up on what has become a tradition of periodically taking stock of both developments in Ukrainian agriculture and the analysis of these developments that we have produced in recent years.

Over the years, the analytical capacity especially of our Ukrainian colleagues in the IER has grown remarkably. This is reflected in a series of empirical analyses in this book based on up-to-date econometric techniques and quantitative policy simulation models. We have maintained in this book the tradition of inviting outside experts to contribute to our book in areas that we have not been able to cover ourselves, thus increasing the scope of the analysis and ensuring that not all topics are seen from the same perspective. As in the past, we have endeavoured to update all of the chapters to a certain extent, since some were originally written as much as two years ago. However, such updating is not always entirely possible. It is our conviction that many basic economic relationships and policy messages remain the same even as numbers change from year to year.

The structure of this book is simple. In Part I we study several broad topics that relate agriculture to overall economic development in Ukraine such as the implications of WTO membership for Ukrainian agriculture, the mix of different agricultural policy tools employed in the country, the system of agricultural taxation and the links between agricultural productivity and poverty. In Part II we adopt a farm enterprise perspective, focussing on competition for land as well as farm efficiency, organisation and management. In Part III we concentrate on policy in several specific markets such as grain and oilseeds, and on futures markets as a potential risk management tool for agriculture in Ukraine. While agriculture in Ukraine is too vast a topic to be covered comprehensively in any single volume, we hope that this selection of chapters and topics provides food for thought and conveys some of the excitement and interest that we have felt working in and on agriculture in Ukraine.

3 Outlook and acknowledgements

This book would not exist if we had not received a great deal of support and encouragement. As members of the German Advisory Group on Economic Reform with the Government of Ukraine we would like to thank the other members of this group and its

---

1 The other two books are Die Transformation der Landwirtschaft in der Ukraine: Ein weites Feld (1999, in German and Ukrainian), and Policies and Agricultural Development in Ukraine (2001, in English and Ukrainian). See the references at the end of this introduction. Both books are available on the website of the Institute for Economic Reform and Policy Consulting at www.ier.kiev.ua.
leaders – Prof. Dr. Lutz Hoffmann and Dr. Lorenz Schomerus – for their support and for their interest in our work on agriculture. The Director of the Institute for Economic Research and Policy Consulting (IER) in Kiev, Prof. Igor Burakovsky, and the staff of the IER have also helped us in many ways. We are also grateful for support from the Kreditanstalt für Wiederaufbau (KfW) and the German Government’s TRANSFORM-Program for the countries of Central and Eastern Europe that has made our work in Ukraine possible in the first place. This work has also benefited greatly from continuing cooperation with the German Ministry of Consumer Protection, Food and Agriculture. Of course, the opinions expressed in this book are those of the authors, and do not necessarily reflect those of the KfW, the German Government or any other institution.

Our most sincere thanks go to the Ukrainian policy makers and analysts who have shared their valuable time with us over the years, meeting with us, reading our papers, asking questions, debating and disagreeing. We appreciate that our task as ‘abstract’ economists is much easier than that of the policy maker who must weigh a great variety of factors in each decision. Regardless of any differences of opinion, our exchanges were always open, fair and fruitful. The genuine interest and respect that we have always sensed have been a continued source of motivation.

In closing, three individuals who have helped us with the ‘logistics’ of producing this book deserve mention. We would like to thank Tamara von Bernard in Göttingen, who put all the pieces together and co-ordinated the day-to-day work professionally and with great patience. Dr. Sergiy Zorya was a major contributor to several chapters and an invaluable co-ordinator in Göttingen, and together with Oleg Nivyevskiy in Kiev provided vital input into editing the Ukrainian version. All remaining errors are our own, but far more would remain if not for their help.

November 2004

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4 References


Part I:
Agriculture and Economic Development in Ukraine
1 The Implications of WTO-Accession for Agricultural Policy in Ukraine

STEPHAN VON CRAMON-TAUBADEL & SERGIY ZORYA

1 Introduction

Ukraine's stated intention to join the WTO, the ongoing negotiations with its Working Party, and the resulting conditions under which Ukraine could be accepted as a member have attracted attention for several years. In this chapter we deal with the agricultural dimension of these questions. However, the Doha Round of WTO negotiations that is currently proceeding without Ukraine will also have important implications for agriculture in Ukraine. Ukraine is currently negotiating with the WTO on the basis of agricultural provisions established under the Uruguay Round Agreement on Agriculture (URAA) in 1993. It may be that the result of the Doha Round shifts some of the URAA parameters, creating the need for further adjustment in Ukraine beyond whatever adjustment results from a successful completion of Ukraine's membership negotiations. Both processes – Ukraine's membership negotiations and the Doha Round – are uncertain as regards both outcome and timing. Hence, at the moment, it is only possible to engage in more or less informed speculation.

The discussion of membership implications in the body of this paper centre largely on the disciplines and commitments that are likely to result for agriculture and agricultural policy makers in Ukraine. These disciplines and commitments will clearly reduce some of the freedom enjoyed by Ukrainian agricultural policy makers. For example, WTO members are generally not permitted to use certain policy instruments such as export subsidies. So WTO membership would reduce the 'feasible set' of instruments from which agricultural policy makers in Ukraine can choose. However, Ukraine would also gain a great deal from WTO membership, in agriculture as in other sectors. The benefits of membership include the following:

- WTO membership would add impetus and urgency to Ukraine's agricultural policy reform agenda, and would also commit Ukraine to a more stable and transparent agricultural policy than has been implemented so far. This would have positive effects on both domestic and foreign investment, something which is of particular importance for a sector that is capital and know-how intensive such as agriculture. As a result, Ukraine, as a WTO member, could tap its agricultural potential faster, to the benefit of the entire economy.

- WTO membership would also give Ukraine a voice in future debates on the international rules governing agricultural trade and policy making. With its comparative advantage in agriculture and its status as a 'small' country exporter of

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1 An earlier version of this chapter, also entitled “The Implications of WTO-Accession for Agricultural Policy in Ukraine”, was published in the volume Ukraine's WTO Accession, Heidelberg, Physica-Verlag, 2004, p. 229-241. Permission to publish this revised version here is gratefully acknowledged.
major temperate agricultural products such as grains and oilseeds (and potentially livestock products), Ukraine appears predestined to become a member of the Cairns group. Like other Cairns group members, Ukraine desperately needs a level playing field in international agricultural trade. It was the Cairns group's insistence in the Uruguay Round that led to the first substantive agricultural agreement in the history of the (GATT-) WTO, and many are pinning their hopes on similar advocacy by the Cairns group in the Doha Round.

Finally, as a WTO member, Ukraine would enjoy access to the WTO's dispute settlement mechanism and protection from arbitrary treatment by its trading partners. That this can be of great importance has been demonstrated recently in connection with the EU's decision to introduce grain import quotas. While the EU had to consult with other WTO members such as Canada and the US on this matter, it did not have to consult with Ukraine. As a result, Canada and the US were able to secure fixed tranches of the EU’s import quota, while Ukraine has to compete with other countries for the rest of this quota on a first-come, first served basis.

In the following we begin by briefly outlining the relationship between agriculture and the WTO (section 2), before proceeding to consider the likely impact of WTO membership on agriculture and agricultural policy making in Ukraine (section 3). We close in section 4 with conclusions and a brief look forward.

## 2 The WTO and agriculture

Agriculture has a special place within the WTO largely because it is spent most of the history of this organisation – and its predecessor, the GATT – outside. As mentioned above, the Uruguay Round marked a turning point in that, largely as result of the insistence of the Cairns group, agriculture was for the first time subjected to meaningful disciplines. While the subjection of agriculture to international rules governing trade without doubt represented a major breakthrough, in retrospect the concrete impact of the URAA on domestic agricultural policies in the member countries has been rather disappointing. As illustrated in figure 1.1, for example, there has been some reduction in overall agricultural

---

2 As it is, the Doha-Round has been influenced by a new so-called G-20 group of 20 developing countries that has, to some extent, eclipsed the Cairns Group. The G-20 is spearheaded by Brazil and, like the Cairns Group, is insisting on farther reaching changes in agricultural policies in the industrialised countries, primarily the EU and the US. This insistence was a major factor leading to the collapse of the Doha-Round negotiations in Cancún in September 2003. The prospects for a successful completion of the Doha Round are discussed below.

3 The EU's decision to impose grain import quotas is unfortunate and not in the spirit of a progressive liberalisation of world agricultural trade. Indeed, it borders on hypocritical when firms in the EU lobby for the opening of Ukraine's markets for agricultural machinery and other farm inputs, while the EU simultaneously restricts its own markets for the grains that these inputs are used to produce. Most recently, the EU has signalled that it is willing to discuss the possibility of granting Ukraine (and Russia) their own fixed tranches of its grain import quota.
support in the OECD since the mid-1980s. Since the mid-1990s, however, no clear trend is apparent. As a matter of fact, in the US agricultural support is on the rise.

**Figure 1.1: Agricultural support in the OECD (1986-2001, % PSE)**

With high insight it is clear that the URAA contained too many loopholes. These include base period definitions that were designed to leave as much leeway as possible, and commitments to reduce support or import protection that could be applied on average, leaving considerable discretion to maintain 'peaks'. As a result, agricultural support in the OECD as a whole in 2001 amounted to a staggering 258 billion € or roughly 1% of total OECD GDP. As is apparent in figure 1.2, the EU and the US are responsible for the lion's share of this support.

In view of these agricultural policies elsewhere, it is easy to empathise with the position of Ukraine's negotiators with the WTO, who must at times feel as if they are being subjected to a double standard: “Don’t do as we do; do as we say”. Nevertheless, it is important not to draw the wrong conclusions from a Ukrainian perspective regarding the desirability of agricultural protection and support. First, as the numbers in figure 1.2 illustrate, agricultural support is very expensive. While it might benefit farmers, it places a

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4 Agricultural support is measured in figure 1.1 using the Producer Subsidy Equivalent (PSE) concept developed by the OECD. The PSE measures support to farmers from consumers through higher commodity prices and from taxpayers through budgetary transfers. The PSE is defined as the annual value of the total monetary transfers from consumers and taxpayers to agricultural producers as a percentage of gross farm receipts (OECD, 2000).

5 Many of these aspects of the URAA are discussed in detail in GAISFORD & KERR (2004).
significant burden on taxpayers and/or consumers. When support takes the form of protection (for example price support or production quota systems) it leads to economic waste, reducing economic growth and destroying jobs. Even if ‘rich’ countries such as the EU feel that they can afford these costs, it is abundantly clear that Ukraine cannot.

Figure 1.2: Agricultural support in OECD countries (2001, bill. €)

Second, note that while agricultural support in the OECD countries has not fallen much on average since the end of the Uruguay Round, the structure of agricultural support has been changing. As illustrated in figure 1.3, the importance of price support has fallen progressively in the EU since the early 1990s, while the importance of various forms of direct payment has increased.
This is important because, again, different types of agricultural support are associated with different degrees of efficiency. As illustrated in figure 1.4a, only roughly 40% of price support payments end up in farmers' or land owners' pockets – the remaining 60% end up either wasted or in the hands of input suppliers. Decoupled payments are considerably more efficient as roughly 90% end up benefiting farmers (figure 1.4b). Hence, while agricultural support remains prevalent, there is a clear trend to more efficient forms of support. The so-called Mid-Term Review (MTR) reform proposals tabled by EU agricultural Commissioner FISCHLER and adopted by the EU Council of Ministers in 2004 – with their emphasis on further reduction in price support and a move to decoupled income transfers – are symptomatic of this trend. Ukraine would be well advised to anticipate the results of this trend and design an agricultural policy that is forward looking and does not force Ukraine to repeat the costly mistakes that have created so much domestic and international friction elsewhere.
Third, the results of the ongoing Doha Round of WTO negotiations can be expected to continue and perhaps accelerate the trend toward progressive liberalisation of agricultural policies and the implementation of less distortive policy tools world-wide. The outcome of the Doha Round became uncertain after the Cancún Ministerial meetings collapsed in September 2003 due primarily to a lack of progress on agriculture (see footnote 2). However, on August 1, 2004, the 147 members of the WTO, after protracted and difficult negotiations, succeeded in agreeing on a so-called ‘framework’ for continued negotiations on agriculture. Most experts now expect that after the US presidential election and the installation of the EU Commission in late 2004, the intensity of the Doha Round negotiations will pick up again. In what may be a major breakthrough, the EU has finally agreed that it is willing to consider the possibility of eliminating all its agricultural export subsidies, as long as export subsidies and other tools such as export credits that have a similar impact are eliminated by all other WTO members as well.

Whatever the exact outcome of the Doha Round, a return to the policies of the 1960s and 1980s with their emphasis on price support is out of the question. So, again, Ukrainian policy makers should look forward and not back in their search for ‘Leitbilder’. Any progress in the area of agriculture as a result of the Doha Round would benefit Ukraine. In particular, a reduction in the use of export subsidies as proposed by the EU would make it easier for Ukraine to compete on world markets.

3 The implications of WTO membership for Ukrainian agriculture

The URAA contained provisions in four major areas related to agriculture. These are: market access; domestic support; export subsidies; and sanitary and phytosanitary measures. These categories are also framing the current Doha Round negotiations on agriculture, so it makes sense to structure the following discussion along these lines as well.
3.1 Market access

As the outcome of the negotiations between Ukraine and the member countries of Ukraine's WTO working party are ongoing, it is not yet clear exactly what concessions Ukraine will have to make in the area of market access. Ukraine has offered to reduce its tariffs on major agricultural products from the current levels illustrated in figure 1.5 to the bound levels also presented in this figure. This would reduce Ukrainian agricultural tariffs from roughly 30% to 13% on average, and there are indications that the members of the working party are more or less in agreement with this proposal.

Figure 1.5: Current and committed bound MFN tariffs for selected agricultural commodities in Ukraine in 2001

![Graph showing current and committed bound MFN tariffs for selected agricultural commodities in Ukraine in 2001.](image)

Note: Most favoured nation tariffs are shown in *ad valorem* terms. Since most agricultural commodities in Ukraine are subject to 'combined tariffs' (*ad valorem* and specific tariffs), and specific components are often higher than the announced *ad valorem* rates, the *ad valorem* equivalents of specific tariffs are included in figure 1.5. The *ad valorem* equivalent is defined as the specific tariff divided by the border reference price and multiplied by 100. For details see WORLD BANK & OECD (2004).


Membership in the WTO would also entail that the frequent use of specific agricultural tariffs in Ukraine would have to be curtailed in favour 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 as a means of providing countries such as the EU – that were required to transform variable import levies and other non-tariff barriers to trade into bound tariffs – with a means of dealing with the import surges that might result. Since Ukraine makes no use of such measures, it will not be required to subject them to ‘tariffication’ as a result of WTO membership and will therefore be in no greater danger of import surges after the fact than it was before.

A contentious area with regard to market access is sugar. As can be seen in figure 1.5, sugar is the one important agricultural product for which Ukraine has offered no
tariff concessions. Ukraine is a net importer of sugar, so controlling imports is, together with the domestic production quotas that have been implemented, a means of controlling domestic prices. The size of Ukraine's tariff rate quota for imports of raw sugar has been an issue of contention with some members of the working party; amounts of 200 thd. tonnes and 260 thd. tonnes have been discussed. As the Ukrainian authorities have discovered, and as was predicted several years ago by the German Advisory Group (VON CRAMON-TAUBADEL, 1999), Ukraine's sugar policy has generated considerable incentives for smuggling. Hence, the size of the tariff rate quota may be at least partly academic. Unfortunately, sugar would appear to be one area of agricultural policy in which Ukrainian policy makers are insisting on repeating the costly errors committed elsewhere. In 2004, the EU has finally tabled extensive reform proposals for its sugar market policy.

### 3.2 Domestic support

The area of domestic support is perhaps one of the most controversial areas in the negotiations between Ukraine and the members of its WTO working party. Ukraine has proposed that a 1994 to 1996 base period be employed to define Ukraine's bound level of domestic support. The use of this base period leads to an aggregate measurement of support (AMS) of 1.38 bUSS. Some members of the working party are, however, insisting on the use of a 1997 to 1999 base period that would leave Ukraine with an AMS of 61 mUSS. Ukrainian officials argue that 1.38 bUSS 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 (recall figure 1.2 above). They also argue that the use of 1997 to 1999 – the depth of Ukraine's agricultural crisis – is not at all representative and would limit Ukraine to a level of support that is not in keeping with the agricultural policy needs of such a large and important sector of the Ukrainian economy. Some working party members are insisting, however, that any amount of agricultural support is simply too much, and that Ukrainian agriculture should not be permitted to become addicted to subsidies in the first place. These countries – for example Australia – are concerned that without strict WTO disciplines Ukraine would end up joining the ranks of those competitors that use subsidies to compete unfairly on world agricultural markets.

Ukrainian negotiators might be forgiven for suspecting that the strict demands on Ukraine's AMS level that some members of the working party are making are at least partly the result of frustration born from their inability to apply meaningful pressure to the much larger and much more trade distorting domestic support provided by the US and the EU. On the other hand, Ukraine provides the majority of its domestic support (roughly 80%) in the form of tax exemptions that are not included in AMS calculations. Hence, the debate over 1.38 versus 0.06 bUSS of domestic support is to some extent artificial. Regardless of the amount that is finally bound, tax exemptions will continue to provide a means of delivering

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6 As a result of production quotas and import barriers, domestic prices for white sugar in Ukraine have ranged between 2000 and 2200 UAH/tonne in recent months, the equivalent of 375 to 410 US$/tonne or roughly twice the world market price.

7 Note that Australia's agricultural policy is very liberal in comparison with other OECD members. Its PSE currently amounts to 4% or 1 bUSS (TANGERMANN, 2002).

8 See VON CRAMON-TAUBADEL & ZORYA (2001).
more support. For these reasons Ukraine would be ill advised to allow the success of its WTO negotiations to hinge on the domestic support issue. Ukrainian policy makers should ensure that whatever agricultural support they provide consists of Green Box measures – such as support for education and research in agriculture and the development of agricultural marketing infrastructure – that would not be subject to domestic support disciplines in the first place.

3.3 Export subsidisation

As Ukraine has not employed export subsidies in the past it follows – and would appear to have been accepted by all parties to the negotiations – that Ukraine should receive no allowance for the use of export subsidies in the future. Since it is likely that the Doha Round will lead to a major curtailment and perhaps even the elimination of the use of export subsidies in agriculture, it would probably not make much sense for Ukraine to insist – as Russia currently is – on receiving an export subsidisation allowance; the ‘bargaining chips' that would be required to gain concessions in this area can be better employed elsewhere.

An important implication of the fact that Ukraine would not be permitted to use export subsidies as a future WTO member is that as a net exporter of most important agricultural products, Ukraine would not be able to employ domestic price support measures. This is because domestic price support in an export situation necessarily leads to the accumulation of surpluses that can only be exported with the use of some form of export subsidy, either implicit or explicit. This means, for example, that the intervention system for grain that Ukraine introduced in the summer of 2002 is fundamentally incompatible with the likely conditions of Ukraine's WTO membership. WTO membership would therefore result in a considerable reduction in the range of policy tools available to agricultural policy makers in Ukraine. From an economic efficiency perspective this would be a positive development as it would preclude the use of inefficient and distortive price support policies (recall the discussion surrounding figure 1.4a above). By joining the WTO, agricultural policy makers in Ukraine would in effect be committing themselves to resist the temptation to use these tools in the future.

3.4 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 are disguised protection. The SPS agreement aims to harmonise the SPS measures applied by WTO member countries and ensure that they are both transparent and based on science.

As the procedures used to test for contamination become increasingly sophisticated and sensitive, and as consumers in industrialised countries become increasingly sensitised to food quality issues, there has been some concern that SPS measures could lead to a ‘race to the top’ whereby industrialised countries set very exacting 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.

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. As alleged findings of various types of contamination in shipments of Ukrainian grain to Brazil, France and Canada attest, the issue of product quality and the SPS measures employed to control this quality is already of vital importance to Ukraine. While the costs of developing the required SPS infrastructure in Ukraine are high, 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.

4 Conclusions

Experience in many countries has shown that agricultural policy making is fraught with difficulties. Agricultural interests – farmers, landowners and input suppliers – tend to be well organised and ‘capture’ the policy making process. As a result, agricultural policy tends to be both inefficient and resistant to reform. Experience, for example in the EU or New Zealand, has also shown that when agricultural policy reform does occur, it is not because agricultural policy makers have suddenly ‘seen the light’. Instead, agricultural policy reform is almost always imposed from outside, for example by strapped budgets or by the need to meet international commitments. The WTO is one source of such international commitments. While the results of the Uruguay Round breakthrough on agriculture have been somewhat disappointing in retrospect, this breakthrough did at least bring agriculture to the table and initiate a discernable trend towards less distorting forms of agricultural support worldwide.

An agreement on Ukrainian membership in the WTO is within reach. The likely agricultural conditions of WTO membership for Ukraine would not appear to be very onerous. Some liberalisation and market opening would result, but Ukrainian agriculture is only beginning to emerge from the transition crisis of the 1990s and agricultural policy in

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9 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.

10 See VON CRAMON-TAUBADEL (2002).

11 See the evidence on the costs of the required investments in SCHULER (2004).
Ukraine is only beginning to take on clear contours. Hence, much is in flux and could be adapted with relative ease. It is much more difficult to change agricultural policy once it, and those who benefit from it, become firmly entrenched. If only for this reason, Ukraine should welcome WTO membership and make every effort to secure it quickly. The requirement that Ukraine would have to abstain from employing export subsidies as a WTO member would have especially far-reaching consequences in this regard; it would preclude the use of price support policies for agricultural products that Ukraine exports. This is just one of the ways in which WTO membership could help Ukrainian policy makers avoid the agricultural policy mistakes that have proven so costly and difficult to repair elsewhere.

5 References


2 Shifting Agricultural Policy towards Measures Envisaged by the Green Box

SERHIY DEMYANENKO & VIKTORIYA GALUSHKO

1 Introduction

Opponents of accession to the WTO in Ukraine sometimes argue that Ukraine would surrender too much sovereignty in the area of agricultural policy by joining. In this chapter we argue that this is not the case. Even as a WTO member, Ukraine would still enjoy a great deal of freedom to support its agricultural sector. WTO regulations limit the use of certain types of support that are wasteful and trade distorting. But at the same time they stipulate that members can provide support to agriculture within the framework of so called Green Box measures. Green Box measures are exempted from reduction commitments, so WTO members are completely free to apply them. They are also efficient measures that are particularly well suited to fostering sustainable agricultural growth. Thus, by joining the WTO and emphasizing Green Box measures, Ukraine could make a step towards establishing favourable conditions for long-term, steady and sustainable agricultural development, the improvement of rural welfare, and the development of market and social infrastructure. Accession to the WTO would improve the prospects for agricultural growth in Ukraine by reducing the temptation to implement inefficient market and price support policies, and by focusing attention on Green Box measures that minimize distortions and maximize long run policy benefits for agriculture.

The goal of this paper is to outline the potential for applying Green Box measures to support Ukrainian agricultural producers. The paper is structured as follows. Section 2 describes Green Box measures that can be implemented through publicly-funded state programs or can be financed by the state budget. Section 3 discusses the importance of Green Box measures for the sustainable development of Ukrainian agriculture and their applicability in Ukraine. In the concluding section we provide recommendations for the future development of a ‘WTO-compatible’ agricultural policy in Ukraine.

2 What is the Green Box?

As a result of previous rounds of WTO negotiations, it was agreed to classify agricultural support measures into three categories according to whether they distort agricultural production and trade. Using the metaphor of a traffic light, these categories were labelled the Red Box (measures which are forbidden), the Yellow Box (measures which are tolerated but must be phased out over time via reduction commitments) and the Green Box (measures which are not subject to reduction commitments). To qualify for the Green Box, measures must meet the following criteria:

1 As a result of a compromise between the EU and the US reached during the Uruguay Round of WTO negotiations, a fourth category, the Blue Box, was created. The Blue Box essentially contains Yellow Box measures that are temporarily exempted from reduction commitments. There are many indications that the Blue Box will be sharply curtailed and perhaps even eliminated, as a result of the current Doha Round of WTO negotiations.
• They shall have no or at most minimal trade-distorting effect or effects on production; and,
• The support should be provided through publicly-funded government programs not involving transfers from consumers.

Major Green Box measures included in general services are the following:

1. Research, including general research and research related to particular products, research connected with environmental programs.
2. Pest and disease control such as early-warning systems, quarantine and eradication.
3. General and specialist training.
4. Extension and advisory services, including transferring information and the results of research to producers and consumers.
5. Inspection services for health, safety and standardization purposes.
6. Marketing and promotion services. Expenditures for purposes that could be used by sellers to reduce their selling price or confer a direct economic benefit to consumers are excluded; and,
7. Infrastructural services, including: electricity, roads and other transportation means, market and port facilities, water supply facilities, dams and drainage schemes and infrastructural works associated with environmental programs. In all cases expenditures should be directed to the provision or construction of capital works only and should exclude the subsidized provision of on-farm facilities.

Besides these support measure, governments may also provide services to agricultural producers through other public programs. However, all these measures should meet the two main criteria mentioned above. Such measures and programs include:

8. Accumulation and holding of stocks of agricultural and food products which form an integral part of a food security program identified in national legislation. Purchases to and sales from food security stocks should be transparent and made at current market prices.
9. Support of low-income population through subsidized prices or food stamps. Such aid should be directly targeted. Food purchases by the government should be made at current market prices.
10. Direct payments (in cash and in kind) to producers to support their incomes. These payments should have no or minimal trade- or production-distorting effects, they should be made through publicly funded government program and they should not be connected to price support.
11. Indirect income support that is not related to production or prices.
12. Government financial participation in income insurance and income safety-net programs. These programs should not be related to production or prices.
14. Structural adjustment assistance provided through producer retirement programs.
15. Structural adjustment assistance provided through resource retirement programs.

16. Payments under environmental programs; and,

17. Payments related to assistance programs for farms located in regions with unfavourable weather conditions. These programs are not related to production or prices.

Thus, a wide variety of agricultural support measures are in line with WTO requirements. Slowly but surely, the trend in agricultural policy in most WTO member countries is to emphasize the use of these Green Box measures and reduce the use of ‘traditional’ market and price support (MPS) tools such as intervention systems and various input and output subsidies. In the EU, for example, MPS accounted for 91% of all support to agriculture in 1986-88, but this share fell to 61% in 2000-02. The ‘Fischler Reform’ of the EU’s agricultural policy that was adopted in June 2003 will reduce the share of MPS significantly further, by ‘decoupling’ payments to farmers, i.e. making them independent of production so that they come under category 10 above.

Why are countries such as the EU moving away from MPS and towards the Green Box? Three main reasons play a role, and all are very pertinent to the situation in Ukraine today. First, agricultural MPS distorts production and trade. This unfairly damages the interests of trading partners and leads to trade disputes that threaten to spill over to other sectors of the economy. Hence, disciplining agricultural policy is necessary as a means of stabilizing and improving international trade relations. In the case of Ukraine, some members of the farm lobby seem prepared to sacrifice WTO membership to defend Ukraine’s ‘right’ to freely implement MPS policies in agriculture, without considering the potentially catastrophic impact that this would have on Ukraine’s trade relations as a whole and, hence, its overall prospects for continued economic growth.

Second, it is well documented that agricultural MPS is a highly inefficient way of helping agricultural producers. The OECD has recently published detailed analysis that demonstrates just how inefficient MPS can be. For example, using price support measures such as an intervention price system (something that many agricultural policy makers in Ukraine advocate) it is typically necessary to take 3 to 4 UAH away from consumers and taxpayers in order to increase farm incomes by 1 UAH. Income support payments that are not linked to prices or production (a Green Box measure) are much more efficient, with roughly 90% of each UAH that is taken away from consumers and taxpayers ending up in the pockets of agricultural producers. In other words, even if it did not threaten to damage international trade relations and compromise Ukraine’s bid to join the WTO, Ukrainian policy makers would be well-advised to eschew MSP simply because it is ‘bad’ policy.

Third, and finally, it is increasingly recognized that Green Box measures are the best way to help agriculture grow in a sustainable manner. MPS generally aims at boosting agricultural incomes, but this does not necessarily help create a robust, competitive agricultural sector in the long run. The EU is an excellent example: After decades of expensive MPS, much of the EU’s agriculture remains inefficient and dependent on continued support. The difference between MPS and Green Box measures is perhaps best described as the difference between spending money on consumption (i.e. for short term pleasure) and spending on investment (i.e. for long term gain). Green Box measures – especially those related to education, training, research and extension – are investments, and this is, in our opinion, what responsible policy makers should focus on.
Of course, MPS is addictive. Countries such as the EU cannot eliminate these policies overnight, because farmers have become accustomed to them and the artificial economic ‘success’ that they create. So the process of reform – turning away from MPS and towards the Green Box – is slow. Some rich countries with little comparative advantage in agriculture (Japan, Norway and Switzerland, for example) insist on their need to continue with agricultural policies based on MPS. But in the major agricultural exporting nations of the world (for example, Australia, Canada, the EU and the USA), the move towards Green Box measures is clear and irreversible, encouraged by the need to reduce budget spending on agriculture and support for the WTO process. Ukrainian agricultural policy makers still have the historic opportunity to avoid the addiction of MPS and embark today on the sort of agricultural policy path that many of its important competitors on world markets are struggling to regain.

3 Application of Green Box measures in Ukraine

What is the current status of Green Box measures in Ukrainian agricultural policy today? Public investment in the Ukrainian agricultural sector and rural areas in general has been diminishing over the last few years due to severe fiscal constraints faced by the government. It is unlikely that government spending on agriculture can be increased significantly in the near future, which underlines the need for a better and more efficient allocation of the limited available resources. It is vital that the government identify policy measures that will strengthen the responsiveness of the agricultural sector to market signals, maximize sustainable growth and minimize trade distortions.

According to the results of negotiations between Ukraine and the members of its WTO working party, a number of measures have been attributed to the Green Box (see Kobuta & Shvetsov, 2002). In the following we discuss the importance of these measures in contributing to the long-term, steady and sustainable development of Ukrainian agriculture and review the trends in government spending on these measures over the last few years.

General research and research programs related to particular products. In order to not only maintain but also strengthen competitive advantage, farmers have to continuously strive to reduce production costs by improving their production methods. This is especially true in Ukraine, where production technology often lags behind international standards and many technologies that are successful in other countries have not yet been fully adapted to Ukrainian conditions (e.g. rapeseed and soybean production). Agricultural research plays an important role in driving cost-reducing technological change and in providing high-yield and disease-resistant crop varieties that will lead to increased food supplies, and, consequently, lower food prices for consumers.

Budget expenditures on research include expenditures on exploratory development and applied research, scientific works of state and inter-sectoral programs, general basic research by scientific institutions and research related to particular products. The Ukrainian budget for 2002 envisaged appropriation of 291.2 mUAH to finance agricultural research; however, only 176.4 mUAH were actually spent. This is about 5% of total agricultural support. In the 2003 budget, the planned expenditures on research were reduced to
175.9 mUAH\textsuperscript{2} and the execution rate was roughly 98%. In 2004 the expenditures on agricultural research are planned to be increased by 34.5% compared to 2003 (a reduction of 19% compared to 2002 planned expenditures).

**Extension and advisory services.** Many Ukrainian farmers are highly inefficient and there is a wide gap between the actual productivity on farms and what could be produced with better know-how. This productivity differential is not – despite what some farm lobbyists would like us to believe – simply a question of supplying farms with capital so that they are free to invest. Instead, it arises due to unawareness by many farmer managers of the latest scientific progress in crop and animal selection, cost-reducing technologies ("technology gap") and employment of old management practices ("management gap")\textsuperscript{3}. As a result, many farms in Ukraine produce far less with the inputs that they do have than they could.

Extension plays an important role in transferring knowledge about improved seeds, other inputs and technologies from researchers to farmers, in giving advice to farmers in their decision-making and in educating farmers on how to make better decisions. Extension is an important tool in helping farmers to reduce differential between potential and actual yields by accelerating technology transfer, thus reducing technological gap, and by helping farmers to become better farm managers, thus reducing management gap. Public spending on extension and advisory services includes expenditures on maintenance of research laboratories, crop protection stations that provide consulting services to farmers and disseminate information. However, despite the importance of extension services, fiscal restraints have led to a financial crisis in agricultural extension in Ukraine. Indeed, expenditure on extension and advisory services accounted for only 0.04% of total agricultural support in 2002 (1.5 mUAH), and no money has been allotted for this purpose in 2003 and 2004.

**Pest and disease control.** Animal disease control measures are crucial for ensuring animal health and protecting people from transferable diseases. It has been said that medicine cures people, while veterinary medicine heals mankind. Under-investment into the development of early-warning systems can result in huge losses for society as a whole. For example, the Ministry of Agrarian Policy reports that losses in England due to the recent outbreak of foot-and-mouth and mad cow disease amounted to roughly 32 and 12 bUS$ respectively; and hog cholera in Holland accounted for 4.5 bUS$. Pest control measures are crucial in ensuring high yields of agricultural crops, and, consequently, higher farmers’ incomes. Almost every year the grain harvest in the Southern regions of Ukraine is damaged by locusts, as a result of which farmers suffer significant losses. Nevertheless, no steps have been undertaken by the government to develop early-warning systems in order to avoid locust invasion, and only eradication measures are financed.

\textsuperscript{2} Initially the government planned to spend 269.6 mUAH on agricultural research, however, due to the “wheat crisis” in 2003 and consequent disaster payments to agricultural producers (716 mUAH planned), the planned expenditures were reduced to 175.9 mUAH after revision of the budget in early summer.

\textsuperscript{3} Inefficiency and management problems in Ukrainian agriculture are discussed in detail in chapters 8, 9 and 11 of this book.
In the 2002 state budget 60.5 mUAH were appropriated for pest and disease control measures, of which only 37.2 mUAH were actually allocated for this purpose. The 2003 budget includes provisions for 64.5 mUAH of spending, which is somewhat higher than in the previous year. At the same time the execution rate increased from 61% in 2002 to 98% in 2003. For pest control specifically, 2 mUAH are allocated each year, while the Ministry of Agrarian Policy estimated the need at 64.7 mUAH. The 2004 budget provides for an increase in government spending on plant and animal protection measures by 16.3 mUAH to 80.8 mUAH.

**General inspection services and inspection services related to particular products for health, safety and standardization purposes.** In Ukraine the issue of food safety and standards should receive special attention as Ukraine is becoming an important exporter of agricultural and food products. Unfortunately, in the eyes of many foreign consumers, Ukraine is associated with the Chernobyl catastrophe and possible food safety deficits. For this reason, maintaining and strengthening Ukraine’s reputation as a reliable supplier of safe food is vital to Ukraine’s interests (GERMAN ADVISORY GROUP, 2002).

Government spending on inspection services includes expenditures on the maintenance of state veterinary institutions, state seed inspections, state selection stations and state bread inspections. The trend over the last few years is a gradual increase in expenditures on guaranteeing safety and quality of agricultural and food products. In 2002 it was planned to spend 293.8 mUAH on these measures, however only 265.4 mUAH were actually allocated for these measures. In 2003 government spending was planned to increase to 338.5 mUAH, while 321.5 mUAH were actually spent. In 2004 spending on inspection services is planned to increase to 372.1 mUAH.

**Training facilities.** Educating good specialists and managers for the agricultural sector is vital for boosting agricultural growth. Experience shows that farmers with higher education achieve higher yields by employing more appropriate production methods. Furthermore, education contributes to rural poverty alleviation, since it gives rural residents improved opportunities for off-farm employment.

Expenditures on training services in Ukraine include expenditures for the 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, re-training centres, etc.). In 2002, 446.7 mUAH were slated to be spent on training services, however only 393.9 mUAH were actually allocated. Budget spending in 2003 was planned to be increased to 521.8 mUAH and the plan was executed to 93%. In 2004 the government plans to further increase expenditures on agricultural education to 579.4 mUAH.

**Land reform.** The under-developed land market in Ukraine hampers efficient agricultural production. Unresolved land issues also cut farmers off from external financing (for example, banks are reluctant to provide long-term credits to farmers because very often land is the only tangible asset but it has no market value and cannot be used as a collateral), slowing technological progress in the agricultural sector.

Expenditures on land reform include expenditures on implementing the new land law, implementation of land registration procedures, cadastral examinations, determination of soil quality and agrochemical land certification. The share of these expenditures in total agricultural support remains tiny (0.17% or 6 mUAH). Furthermore, in 2002 only 0.2 mUAH (or 3% of the plan) were actually spent! The 2003 budget envisaged government
spending of 5.7 mUAH, and the execution rate reached 98%. In 2004 it is planned to more than double expenditures on land reform implementation: the expenditures are slated at 12 mUAH.

**Rural infrastructure.** For Ukrainian agriculture to be sustainable in the long run it is necessary to improve farmers’ access to markets, both domestic and international. While Ukrainian trade policy has gradually been liberalized, the effect of trade liberalization can be enhanced if it is complemented by increased investment in rural infrastructure. “Infrastructure, and transportation and communication, in particular, is important to lubricate the wheels of trade and allow the benefits of these economic gains to be distributed across those living in the nations involved in the integration process” (BUTTON, 2002).

Investment in infrastructure would enable farmers to increase returns to agricultural production by lowering the transaction costs, and to increase productivity due to better access to and availability of inputs. Rural infrastructure also has a poverty-alleviation effect, which occurs due to improved non-farm employment opportunities. Poorly developed infrastructure contributes to greater price fluctuations when a country switches from an export to an import situation and *vice versa*. The consequent grain market destabilization observed in 2003/2004 can serve as an illustrative example of the effect of under-investments into infrastructure development.

Expenditures on infrastructure include public investment in the construction of health-care institutions, water pipelines, sewage systems, gas supply networks, roads, sea ports, etc. Despite the importance of rural infrastructure, public spending has remained at an extremely low level (less than 0.5% of total agricultural support). Since 1995 no money has been appropriated for the construction and improvement of rural roads. The 2002 budget envisaged an allocation of 20.1 mUAH for rural municipal economic development, but only 5.3 mUAH were actually spent. The planned spending was increased to 21 mUAH in 2003 and this amount was actually spent. The 2004 budget envisages an increase in budget expenditures on rural infrastructure to 24.6 mUAH.

**Environmental protection.** Spending on environment protection is precisely determined within the framework of the state programs. The share of public spending in total agricultural support is less than 1%. In 2002 42.4 mUAH were planned to be spent on environmental protection measures, however only 27.2 mUAH were actually allocated. The 2003 budget envisaged 45.0 mUAH to be appropriated for this purpose and almost all this money (44.6 mUAH) was actually spent. The 2004 budget contains provisions for an increase in government spending on environment protection measures by 10.3 mUAH to 55.3 mUAH.

**Summary.** In table 2.1 we provide an overview of government spending on Green Box measures in Ukrainian agriculture in 2002, 2003 and 2004.
Table 2.1: Spending on Green Box measures in Ukrainian agriculture (2002-2004, in mUAH)

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<th>Planned mUAH</th>
<th>Executed mUAH</th>
<th>% of TAS</th>
<th>Planned mUAH</th>
<th>Executed mUAH</th>
<th>% of TAS</th>
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<td>3517.8</td>
<td>100.0</td>
<td>4061.5</td>
<td>4061.5</td>
<td>100.0</td>
<td>1506.0</td>
</tr>
<tr>
<td>Of which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>- Green Box measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Agricultural research</td>
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<td>176.4</td>
<td>5.0</td>
<td>175.9</td>
<td>171.6</td>
<td>4.0</td>
<td>236.6</td>
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<tr>
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<td>37.2</td>
<td>1.1</td>
<td>64.5</td>
<td>63.0</td>
<td>1.6</td>
<td>80.8</td>
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<tr>
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<td>1.3</td>
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<td>0.0</td>
<td>0.0</td>
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<td>- Inspection services</td>
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<td>265.4</td>
<td>7.6</td>
<td>338.5</td>
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<td>393.9</td>
<td>11.2</td>
<td>521.8</td>
<td>485.2</td>
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<td>5.3</td>
<td>0.2</td>
<td>21.0</td>
<td>21.0</td>
<td>0.5</td>
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<td>45.0</td>
<td>44.6</td>
<td>1.1</td>
<td>55.3</td>
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Source: Own calculations on the basis of the State Budget data and data provided by THE INSTITUTE OF AGRARIAN ECONOMY.

The share of public spending on Green Box measures in total agricultural support in Ukraine was 25.8% in 2002 and 27.8% in 2003. This suggests that there is considerable scope for increasing Green Box spending for agriculture in Ukraine, even within the current constrained fiscal environment. Most of these Green Box expenditures were allotted to agricultural education followed by inspection services and agricultural research. However, crucial investments in extension and advisory services, infrastructure and the implementation of land reform have been ignored. While actual spending consistently lagged behind appropriations in 2002, the execution of the agricultural budget was close to the planned amounts in 2003 and Green Box measures were even over-executed. This and the fact that further increases in Green Box measures are foreseen for 2004 are promising signs. At the same time, however, there are indications of an increased commitment to market and price support measures (intervention systems etc.) by agricultural policy makers in Ukraine, and this, if borne out, does not bode well for the future efficiency and effectiveness of agricultural policy in the country.

4 Conclusions and recommendations

Accession to the WTO would not reduce Ukraine’s ability to support its agricultural sector. As a WTO member, Ukraine would still be free to implement the entire range of Green Box measures, as these are exempted from reduction commitments under the WTO. Green Box measures provide policy makers with a means of providing lasting support to agriculture in a way that does not distort trade and generate conflicts with trade partners.
The world-wide trend in agricultural policy is towards the increasing use of Green Box measures, as the cost and difficulties associated with market and price support become clear. Ukrainian policy makers should be aware of these difficulties and not take an idealized view of market and price support in countries such as the EU. Scarce fiscal resources should be invested in the future of agriculture, not wasted on propping up the past. Green Box measures provide an ideal vehicle for investments in the know-how, technology, management skills, extension services, rural infrastructure and the implementation of land reform that Ukrainian agriculture will need to be competitive in the coming decades.

5 References


3 Taxation and Ukrainian Agriculture

SERHIY DEMYANENKO & SERGIY ZORYA

1 Introduction

It is no secret that Ukraine inherited an extremely distorted economic system from the Soviet Union with artificial prices, inefficient firms, an impractical legal system, and numerous economic and administrative barriers to the exchange of ideas, technologies and standards. In such an economy, the tax system was not designed to help the economy to grow and to distribute the income and wealth while minimising losses in economic efficiency. It rather served as a tool to allocate resources among enterprises and distribute output based on the bureaucrats’ decisions. In the transformation of Ukraine’s economy from plan to market, the reform of the tax system was an enormously important task to encourage private sector to develop and to allow the government to provide the public goods in the new market environment.

In the market economy, taxes influence many outcomes, including the distribution of income (and wealth) and the allocation of resources. Taxes also play an important role in stabilising the economy. “Forms of taxation and the amount of tax burden have a direct impact on the amount and structure of consumption and savings, on the amount and structure of domestic and foreign investments, and on production and trade and so forth” (LUZIK, 1999). In agriculture, tax policy can have important effects on the number and size of farms, on organisational structures, and on the amount and relative mix of land, labour, and capital inputs. Moreover, agricultural taxation influences other sectors of the economy and the macroeconomic balance of the country as a whole.

The process of transition in agriculture and overall economy is unique in that initial economic growth can be attained not only through well-known long-term factors such as investments, but also through the correction of ‘old’ inefficiencies and the creation of new market institutions. Although this source of productivity gains is exhausted after certain period of time, they create a strong potential for economic growth over the short and medium term (ODLING-SMEE & VAN ROODEN, 1999). Therefore, the creation of an efficient farm tax structure that will remove a large number of the ‘old inefficiencies’ and stop the appearance of the ‘new ones’ is a way to create a long-term competitive farming sector that can contribute to the general economic development of the country.

Currently the agricultural sector in Ukraine enjoys a highly preferential taxation regime. This regime was expected to expire in 2004, but was prolonged until 2010. In this chapter, we consider the farm tax system with respect to its influence on the efficiency of the agricultural sector, the whole economy, and the fairness of the farm tax burden. The latter is closely related to the issue of farm subsidisation. However, we cover this issue only briefly since the pros and cons of farm subsidisation have been already discussed many times (see VON CRAMON-TAUBADEL & STRIEWE, 1999; VON CRAMON-TAUBADEL et al., 2001). We also would like to stress that it is not our intention to present a draft tax law for Ukrainian agriculture – this is a task for policy makers. However, our economic analysis of farm taxation in Ukraine could help policy makers to look at farm taxation from a more comprehensive and long run perspective.
The chapter is structured as follows. The second section considers the main principles of taxation and defines the key issues of tax reform in transition economies. In the third section, the effects of the different taxes on farm efficiency and overall development are presented. Section four presents the current farm tax system in Ukraine and in section five the analysis of this system is conducted. Section six concludes and presents policy recommendations.

2 Principles and the role of taxation in the economy

2.1 The main principles of taxation

In any economy, fiscal resources are needed to execute state functions. It has been said that what government gives it must first take away. In 1936, the U.S. President FRANKLIN DELANO ROOSEVELT said that “taxes, after all, are the dues that we pay for the privileges of membership in an organised society” (cited in JAMES & NOBES, 1988, p. 8). The government can raise its income through different sources, and taxation is one method of transferring resources from the private to public sector. Others include money creation, charging for goods and services the state provide, and borrowing.

Money creation simply means ‘printing money’ to finance state expenditures. The main problem is that this leads to inflation. As a result, this process has been described as an ‘inflation tax’ (see FRIEDMAN & FRIEDMAN, 1980, p. 267). Another possibility is for the government to change for the goods and services it provides. But in many cases it would be difficult to charge, for example, for defence and law enforcement. A further method of raising money is to borrow it. Governments can borrow either from their own citizens or from overseas, but there are limits to the amounts that people are prepared to lend, even to governments. Taxation has its limits as well, but they considerably exceed the amounts that can be raised by resorting to the printing press, charging consumers directly, or borrowing. “So while governments often use all four methods of raising resources, taxation is usually by far the most important source of government revenue” (JAMES & NOBES, 1988, p. 8).

In most cases the market mechanism is able to supply goods and services efficiently via ADAM SMITH’s “invisible hand”. But under certain circumstances, the market itself is not able to produce the most efficient outcome, and in this case the state may be able to correct or improve the market mechanism. To do so, it will generally require revenue raised by one of the mechanisms described above. If it depends on tax revenue, then it is important that the tax system be effective or ‘good’. Economists and social philosophers from ADAM SMITH on have expressed their views on the principles of a good tax system (SULTAN, 2000). The following are some of the important ones:

- **Economic efficiency**: Taxes should be chosen so as to minimise interference with economic decision making in otherwise efficient markets. Such interference imposes efficiency losses that should be minimised. The preferential treatment of certain goods/services or sectors induces overall inefficiencies through distorted production/consumption decisions.

- **Economic growth**: Taxes should foster economic growth through savings and investment. The tax structure should facilitate the use of fiscal policy for stabilisation and growth objectives (Keynesian contra-cycle fiscal policy, for example). Moreover,
it should ensure a stable and optimal amount of public revenues for financing the supply of public goods (DABROWSKI & TOMCZYNSKA, 2001).

- **Fairness:** “The distribution of the tax burden should be equitable. Everyone should pay his fair share. People with equal capacity should pay the same tax (referred to as ‘horizontal equity’), and people with greater ability to pay more tax (referred to as ‘vertical equity’). A system that is not fair, and allows tax breaks arbitrarily, lacks respect and reduces the willingness to comply” (SULTAN, 2000).

- **Low compliance and administrative cost:** If the incidental costs of complying with the requirements of the tax laws and procedures are high, people have a greater tendency to evade. In addition, the administrative costs have to be low to ensure adequate revenue from taxes. The tax system should employ procedures that are cost-effective.

- **Simplicity and stability:** If tax revenues are not stable over time, it will adversely affect state budget and its programs. Often changes in rates, rules, and exemptions make it difficult for the private sector to make long-term investment plans. Taxes then become a significant source of risk (SULTAN, 2000).

### 2.2 Tax reform in the transition economies

Based on the above-described principles of taxation, the important task of the government in a transition economy such as Ukraine is to adjust its tax system so as to accelerate the transition from plan to market and to ensure the system’s sustainability in the long run:

- The general revenue objective of tax reform in transition economies is to “widen the tax base by shifting the main burden of taxes to households and to make the income tax on enterprises more moderate and more directly related to profits. Another revenue objective is to reduce direct cash payments as a means of subsidising an activity, while obtaining greater revenues by lower, more collectable rates” (see LEONARD, 2000). Although incomes declined in early transition, with economic growth incomes will grow and should become the main base for government revenues.

- Economic efficiency and growth. The tax system should encourage markets by stimulating private production through tax neutrality across sectors and across the public and private spheres. In the new market environment, the state has to take upon itself many functions previously assumed by large enterprises. Hence, the tax system has to ensure stable and sufficient budget income to allow the state to fulfil its obligations.

- To solve specific problems of the transition economy, the new tax system must aim to reduce specific distortions such as arrears, barter and corruption. Economic agents in the Soviet Union were allowed not to ‘pay’ taxes. Thus, to encourage the firms and individuals to pay taxes in the market environment, a comprehensive approach should be taken to change this behaviour without any exemptions and concessions.
3 The tax system and farm efficiency in the long run

In general, the government can tax agriculture in different ways. Income, both individual and corporate, can be taxed; the state may tax value-added or sales; and finally, land, the major production factor of agriculture, can be taxed as well. Below we consider these taxes in turn.

3.1 Personal income tax

Personal income is a good measure of personal power to consume and save. The personal income of farm employees can be received in various forms, including (1) wages, salaries, premiums, and other employment income; (2) income from own household plots; and (3) gifts, inheritance and other irregular income. In transition economies such as Ukraine the second source of the income plays an extraordinary important role for the rural population. Therefore, legislation must precisely define income in a way that adequately reflects personal ability to consume/save, and it must also establish the same rules of taxation for all forms of income (otherwise, people can switch forms of income and reduce income tax liabilities).

An important advantage of personal income tax is that it works as an automatic stabiliser. In the years of high income more is paid, and in years of low income less. "Another advantage is the broad and relatively stable tax base, which can be adjusted to the personal circumstances of the taxpayer" (LUZIK, 1999, p. 22). Personal income tax is expected to raise additional revenue for the state and to promote income de-polarisation in the society. Therefore, this tax can not be completely neutral to individual consumption/saving decisions. However, proper organisation of individual income tax can create minimum distortions in the lifestyle, traditions and habits of population. Clear definition and accurate measurement of personal income and related expenditures, therefore, can help to avoid/lessen possible distortions in employment, income patterns and the structure of saving/investments.

The personal income tax also has disadvantages such as (1) complex rules of tax assessment and the large direct and indirect costs to the state and taxpayers of assessing and settling tax liabilities, and (2) high sensitivity of tax payers to changes in personal income tax legislation and the negative impact of personal income tax on saving. The practice of many countries shows that the deduction of certain expenses is permitted to allow individuals to reduce their taxable personal income. These deductions include pension contributions, medical costs, life insurance, child care allowances, moving expenses and educational costs. Politicians often develop long lists of different deductions to promote ‘socially-acceptable’ income redistribution. However, these personal deductions can be a source of serious economic distortions, especially in the transition economies. The process of assessment and compliance can be very costly indeed (LUZIK, 1999).

3.2 Farm (corporate) income taxation

Traditionally, farm income tax is levied on net income received (accrued) during a specific period (profit), where net income is gross income from farming, capital gains, and other incomes less business expenses. Farm income taxation creates a good opportunity to tax returns on capital and to reduce the administrative costs of income taxation in comparison to personal income tax due to the smaller number of taxpayers and a reasonable
variety of receipts (LUZIK, 1999). This is especially important for Ukrainian agriculture, where the number of farms at roughly 60 000 (15 000 large agricultural enterprises plus 45 000 small private farms) is relatively small by international comparison (for example, the number of farms in Germany is roughly 400 000 and in France – 679 800).

In addition, the corporate income tax is often considered as the payments of the firms for infrastructure that they use or the public education system from which the personal is chosen (SEROVA et al., 2000). However, if farm income taxation is high and its scale is progressive, tax avoidance becomes common and tax administration extremely complicated (DABROWSKI & TOMCZYNSKA, 2001). Therefore, the introduction and operation of a farm income tax requires special care to ensure minimum distortions.

To avoid distortions, uniform definitions of gross incomes and expenses should be clearly stated for all sectors. Profit taxation of different sectors at different rates can cause economic inefficiencies and lead to tax avoidance/evasion. In addition, the presence of many tax exemptions is usually evidence of a weak government position and successful rent seeking by different lobbies. “In the case of transition economies they often reflect the legacy of the previous economic regime where tax incentives played a role of substitute of market equilibrium prices and market competition” (DABROWSKI & TOMCZYNSKA, 2001, p. 7).

As any business, farming involves risks. If an entrepreneur is discouraged from undertaking new risky activities, the effect on the growth of the economy would be extremely damaging. This may be especially important in agriculture where profits fluctuate from year to year more than in the industrial sector, for example. Therefore, farm income taxation should allow for the deduction of net losses to finance potentially long-term profitable projects, and for ‘income averaging’ to stabilise the income tax burden over the years.

3.3 Value-added tax

Value added tax (VAT) is currently the most important source of tax revenue in most countries, raising between 20 and 40% of the total revenue (HIID/CASE, 1998). The main feature of this tax, which distinguishes it from other taxes, is its wider base. Since the tax is based on consumption, revenue increases as consumption levels rise. If exemptions are few and the rate is uniform, the tax is neutral across different sectors of the economy. However, too many exemptions erode the tax base and create discriminations among different sectors.

The economic neutrality of the value-added tax means that this tax (if properly organised) does not significantly affect:

- consumers’ propensity to buy some or another goods and services;
- the horizontal and vertical integration of production and trade; and
- the territorial dispersion of production and trade within a country.

VAT is based on self-enforcement by buyers and sellers. First, collecting VAT credit for purchased inputs through the invoice mechanism encourages purchasers to demand invoices from the sellers, thus preventing non-reporting or under-reporting of sales. The seller is interested in showing as low a price as possible while the purchaser is interested in showing as high a price as possible, in order to get higher input credit. The result is a cost
effective ‘self-policing mechanism’ and ensures better reporting and verifiable records of transactions (HIID/CASE, 1998).

Concerning the VAT rate, the imposition of VAT at a single positive rate on imports and domestic expenditure and at a zero rate on exports, makes it administratively easy. Theoretically the application of reduced rates for basic goods and services does not influence tax neutrality very much because these goods/services do not compete with others and their demand is relatively inelastic. In practice, “however, reduced rate of VAT applied to basic products will lower the tax burden for all groups in the population (if they purchased these products) irrespective of their income” (LUZIK, 1999, p. 31) and is thus regressive. Moreover, “many income inelastic goods are price inelastic as well, hence the distortions associated with taxing different commodities at different rates are greater than often thought to be” (see STIGLITZ, 1988, p. 494).

Special exemptions from VAT should be avoided, as “one exemption in the production/distribution chain (especially in the primary sector such as an agriculture) complicates the situation of the VAT payers in the next stages of production (because they cannot get a VAT refund) and creates temptation to proliferate exemptions” (DABROWSKI & TOMCZYNSKA, 2001, p. 16). Moreover, exemptions of goods/services from VAT at the production level can stimulate artificial vertical integration of enterprises involved in production/trade. Finally, if different goods are taxed at different rates, taxation becomes administratively complex; there are always some commodities that might fall into either high-tax or low-tax categories, and there are thus administrative problems associated with drawing these distinctions (STIGLITZ, 1988).

In summary, this short analysis of the VAT demonstrates that unclear and/or unusual tax rules increase costs of taxation and create many economic distortions. Promotion of standard rules, reasonable tax rates and proper tax administration can help to avoid/reduce many of these distortions and contribute to a ‘good’ tax system.

3.4 Land tax

Finally, the government can tax the agricultural land. The defenders of the land taxation usually claim that this tax increases land use efficiency. This is especially relevant for the transition economies where “the agricultural growth is expected to benefit from the transfer of land from less to more efficient farmers, who are able to pay higher taxes and offer higher purchase prices for land” (VON CRAMON-TAUBADEL & STRIEWE, 2001, p. 240).

Moreover, the land taxation is often considered within the framework of regional policy and tax base mobility. Income tax, for instance, should be relatively uniform across regions; otherwise in the long run people will move to avoid higher tax rates. The same is true of a sales tax, but not (or at least much less so) of a land tax. Land is an immobile asset and can therefore be an important source of tax revenue for local administrations.

4 The farm taxation system in Ukraine

In the Soviet Union, farms did not pay taxes in the conventional market economy sense. The Soviet agricultural enterprises paid taxes into the centralised united social fund, the centralised social insurance fund and other social funds. They also paid individual income tax and farm profit tax. The payments to the united social fund depended on farm
profitability. If profitability was below 15%, the farms transferred 5% of their gross profits; if profitability was between 15 and 40%, the farms transferred 6%; and if profitability was over 40% they paid 9%. The tax to the social insurance fund was based on total wage expenditures at a rate of 2.4%. The rate of the individual income tax was equal to 8% with a tax allowance of 70 roubles per month. The farm profit tax rate was 0.1% for farms with a profitability rate of 25 to 30%; 0.2% if the profitability was between 30 and 40%; 0.4% if the profitability was between 40 and 50%; and 0.5% (but not more than 25% of net farm income) if the profitability was over 50% (MINAGRO, 1985).

The Soviet tax system, therefore, tended to support less efficient farms. Managerial performance was judged above all by success in achieving planned gross output and sales to the state, and not according to efficiency or profitability. Through its state order system, the state controlled both physical and capital input supply as well as output marketing. The production plans were set so high that most farms had no hope of fulfilling them and remained chronically in debt to the state. “These debts were periodically forgiven, as the state assumed that the country should produce everything it needed and the associated costs, both direct and in terms of foregone alternative uses of resources, were ignored” (Van Atta, 2001, p. 83). Agriculture in independent Ukraine, therefore, inherited from the Soviet system both poor payment discipline on the part of farms, and a lax attitude towards debts.

From 1991-1999, the farms were part of the general tax system in Ukraine, with a few exceptions. As production collapsed and farms experienced more and more difficulties, policy makers felt the urge to provide them with support. Since the chronically under-funded state budget could not finance significant subsidies, tax exemptions for agriculture were seen as a possible solution. As a result agriculture in Ukraine received a new tax system at the end of 1999. First a preferential fixed agricultural tax (FAT) was introduced, and later farms were excluded from paying VAT. Initially these tax holidays were granted until the end of 2003, but later they were extended until 2010. Below we consider this new tax system in detail.

4.1 The fixed agricultural tax

In 1999 the Verkhovna Rada introduced the FAT, which replaced twelve taxes previously paid by the farms¹. The FAT lowered the tax burden on farms² and simplified tax calculation and collection. FAT revenue goes to the Pension Fund (68%), the Social Security Fund (2%), and the local budgets (30%). In 2003, amendment of the FAT Law obliged FAT payers to pay income tax on sales of non-agricultural products. Thus, this amendment effectively separated the income tax from the FAT, even though the FAT was supposed to be levied in lieu of 12 different taxes, including the income tax. Although the State Tax Administration acknowledges that this is inconsistent, it has taken no steps to clarify the situation.

¹ The most important of these were: land tax; profit tax; automobile tax; individual income tax; and payments to the Pension, Social Security and Unemployment Funds. See Law of Ukraine “On Fixed Agricultural Tax”, December 17, 1998.

² According to Serova et al. (2000), the tax burden on Ukrainian farms decreased by three times in comparison to 1997 after the FAT was implemented.
Farms of different organisational and legal forms are eligible to pay the FAT provided that they are involved in agricultural production and agricultural products account for over 50% (currently increased to 75%) of their revenues. The base of the FAT is the value of a farm’s agricultural land as determined on July 1, 1997. Land value is determined according to quality and potential productivity and, therefore, can vary substantially from farm to farm. The average land value in Ukraine for FAT purposes is 8733 UAH/ha, ranging from a maximum of 11297 UAH/ha in Cherkasy to a minimum of 6244 UAH/ha in Zhytomyr (excluding Kiev city, Sevastopol and Crimea). The tax rates are specified for two types of the agricultural land: (1) 0.5% of the value of arable land, haying, and pastures, and (2) 0.3% of the value of perennial plantations. In several regions, where the land is considered much less productive (for example, the Polissia zone or the Carpathian region), the tax rates are reduced to 0.3% and 0.1% correspondingly. Tax calculations have to be submitted to the rayon tax administration by February 1 of the corresponding year. FAT is paid monthly, but the payment rates vary so that 10% of the total payment is due in the first and second quarters, while 50 and 30% are due in the third and fourth quarters, respectively. Agricultural enterprises often pay FAT for leased land. Landowners should pay this tax, but for the tax administration it is easier to deal with one large enterprise than with hundreds pensioners and farm workers. Agricultural enterprises presumably reduce their lease payments to landowners by the amount of the FAT.

From 1999 to 2001, farms only had to pay 70% of the FAT (the sum of the Pension and Social Security Fund shares). Initially the FAT could be paid either in cash or in kind, but now only cash payment is allowed. In 2001, Ukrainian farms should have paid 421.7 mUAH the FAT (79 mUS$), but actual payments amounted to 337.4 mUAH (63 mUS$). While collections rates have improved somewhat, the total FAT burden is very low compared with what farms would pay if they were subject to the same taxation as other sectors. The value of this tax exemption is estimated to be 1400 mUAH (MAPU, 2002).

4.2 Value-added tax

Agricultural enterprises in Ukraine benefit from special provisions concerning the accrual and payment of the VAT. First, farms were exempted from paying the VAT to the national budget during the period 1999-2004. The accumulated VAT received from sales had to be deposited in special bank accounts and used only to purchase the agricultural production inputs. In 2001 the VAT tax exemption equalled to 582 mUAH (MAPU, 2002). However, the farms continued paying the VAT for produced non-agricultural products and services (see table 3.1).

Second, producers of milk and meat charge no VAT when they sell their products. Moreover, 70% of the VAT received by processing plants when they sell milk and meat products is given to the farms, while the Ministry of Agricultural Policy accumulates another 30% to finance livestock breeding. According to the Ministry of Agricultural Policy (2002), this resulted in a benefit of 634 mUAH for milk and meat producers in 2001.

Third, the VAT rate for exported goods is equal to zero. In practice, however, exporters have often experienced problems with accurate and complete VAT reimbursement. Since April 2004, traders of wheat, rye and barley who are not involved in agricultural production and processing have lost their right to export VAT reimbursement (IER, 2004).
In general, the special VAT treatment of agriculture undermines the efficiency of the tax system and budget management in Ukraine. As a general principle, tax revenue should always enter the budget as a whole and not be ‘earmarked’ for specific expenditures. In Ukraine this principle continues being ignored.

### 4.3 Other taxes

Farmers in Ukraine pay a fee for environment pollution. This tax is accrued on the fuel consumed at a rate of 3 UAH/tonne of purchased fuel. This tax is distributed between the national (30%) and local budgets (70%). Farms which produce and sell alcoholic beverages and beer must pay 1% of the revenue from selling these products to the national budget. The revenues are used for development of viticulture, horticulture, and hop production in Ukraine.

Finally, since 2001 additional payroll taxes to the Pension, Social Security, and Unemployment Funds have been introduced for farm enterprises. The pension fee is based on wages paid and equals 1% of the wage up to 150 UAH per month and 2% above. Payments to the Social Security Fund equal 0.25% of the wage up to 150 UAH per month and 0.5% above. 0.2% of all wages is paid into to the special security fund to insure against work-related accidents and illness. This is considerably lower the rate collected in other sectors and professions.

### 4.4 The tax burden on agricultural enterprises in Ukraine

Based on data from the WORLD BANK & OECD (2004), agricultural enterprises in Ukraine paid taxes of 3065 mUAH in 1998, 1459 mUAH in 1999, 798 mUAH in 2000, and 1887 mUAH in 2001. Based on these estimations, we can calculate the tax burden as the ratio of taxes paid to Gross Agricultural Output of the large-agricultural enterprises. In 1998 the tax burden was 12.7%, in 1999 it fell to only 6.7%, and in 2000 it dropped even further to 3.8%. In 2001, however, the tax burden grew to 7.4% (table 3.1). In 2000 and 2001, agricultural enterprises on average paid 52 UAH/ha of agricultural land or almost half of the amount in 1998.

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<td>1459</td>
<td>798</td>
<td>1887</td>
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<td>na</td>
<td>429</td>
<td>1353</td>
</tr>
<tr>
<td>3 Taxes paid and tax privileges, mUAH</td>
<td>3272</td>
<td>3514</td>
<td>2837</td>
<td>4585</td>
</tr>
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<td>4 Gross agricultural output of agricultural enterprises, mUAH</td>
<td>24081</td>
<td>21930</td>
<td>21151</td>
<td>25352</td>
</tr>
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<td>5 Actual farm tax burden, % [1/4]</td>
<td>12.7</td>
<td>6.7</td>
<td>3.8</td>
<td>7.4</td>
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<tr>
<td>6 Tax burden from agricultural activities, % [(1–2)/4]</td>
<td>na</td>
<td>na</td>
<td>1.7</td>
<td>2.1</td>
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<tr>
<td>7 Assessed tax burden without tax privileges, % [3/4]</td>
<td>13.6</td>
<td>16</td>
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<td>18.1</td>
</tr>
</tbody>
</table>

Note: na – data is not available.

Source: Own presentation based on STATE STATISTICS COMMITTEE OF UKRAINE (2002) and WORLD BANK & OECD (2004).

The true tax burden of agricultural enterprises, however, was even lower than estimated above. In 2001, for example, VAT for non-agricultural products and services accounted for 72% of all taxes paid. If taxes from non-agricultural activities are deducted from the gross taxes paid by agricultural enterprises, the tax burden decreases from 3.8% to
1.7% in 2000 and from 7.4% to 2.1% in 2001. Finally, if farm enterprises had not been granted any exemptions in 1999, their tax burden would have increased to 16%. Analogous figures for 2000 and 2001 are 13.4 and 18.1%, respectively (table 3.1).

5 Analysis of farm taxation in Ukraine

5.1 The farm tax system and macroeconomic stability in Ukraine

Farming does not occur in isolation from other economic activities. The farm tax system affects macroeconomic development in a country through a number of channels, most of which are invisible. Often agriculture becomes the hostage of these invisible effects, because macroeconomic destabilisation also affects farms. These issues are considered below.

5.1.1 Farm taxes and the state budget in Ukraine

Farm taxes have a direct impact on the state budget and thus overall economic development in Ukraine (table 3.2). Total farm tax privileges are large, equalling on average to 1.3% of GDP over the observed period. Under the existing tax system, farm taxes account for about 2.4% of the total budget incomes. Budget revenue would, however, be another 3.9% higher if tax privileges for agriculture were eliminated. In this case, the budget would have been in surplus rather than in deficit in 1999, and the almost zero balance in 2001 would have been a surplus of 1.8% of GDP. These results support the findings of LEGEIDA (2001), who states that the agricultural sector is among the largest net beneficiaries in the Ukrainian economy. Since the share of agriculture in Ukraine’s GDP equals roughly 12%, it is clear that the agriculture is taxed much less than other sectors.

Table 3.2: The farm tax system and the state budget in Ukraine, 1999-2001

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm taxes paid, mUAH</td>
<td>1459</td>
<td>798</td>
<td>1889</td>
</tr>
<tr>
<td>Total farm tax privileges, mUAH</td>
<td>2055</td>
<td>2039</td>
<td>2696</td>
</tr>
<tr>
<td>Share of different tax privileges in % of total privileges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed agricultural tax*</td>
<td>68.1</td>
<td>68.7</td>
<td>51.9</td>
</tr>
<tr>
<td>VAT tax exemptions</td>
<td>5.7</td>
<td>5.7</td>
<td>21.6</td>
</tr>
<tr>
<td>VAT tax refund from food processors</td>
<td>11.5</td>
<td>20.0</td>
<td>23.5</td>
</tr>
<tr>
<td>Tax arrears**</td>
<td>14.7</td>
<td>5.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Farm tax privileges as a share of GDP, %</td>
<td>1.6</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Share of agriculture in total GDP, %</td>
<td>11.4</td>
<td>11.0</td>
<td>14.7</td>
</tr>
<tr>
<td>Share of farm taxes in total government revenue, %***</td>
<td>3.3</td>
<td>1.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Share of farm tax privileges in total government revenue, %</td>
<td>4.7</td>
<td>3.2</td>
<td>3.7</td>
</tr>
<tr>
<td>Budget balance as a share of GDP, %</td>
<td>-1.4</td>
<td>1.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Budget balance as a share of GDP without farm tax exemptions, %</td>
<td>0.3</td>
<td>2.3</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note: * FAT exemptions are assumed to equal 1.4 mUAH annually based on Ministry of Agricultural Policy information. ** Tax arrears calculated using the ratio of assessed to paid FAT at the end of calendar year. *** Budget revenue and budget balance including the Pension Fund.

5.1.2 The indirect impact of the farm tax system in Ukraine

The indirect impact of farm taxation is felt through an increased tax burden on other sectors of the economy, and reduced export competitiveness. Generally, the higher the tax privileges granted to agriculture, the higher the tax burden on other economic activities. According to LEGEIDA (2001), the main beneficiaries of the distorted tax system in the Ukrainian economy are the agricultural and industrial sectors (though energy and gas sectors are net payers), while the net payers are the transport and communication, construction, and service sectors. Agricultural privileges are not free; they must be compensated by increasing the tax burden on ‘net payer’ sectors.

The higher tax burden on other sectors of the economy is aggravated by increased incentives for resources to move to subsidised sectors, making them more expensive. “Agricultural tax privileges, for example, create a strong incentive to retain agriculture as a fundamental feature of the production structure, even though market demand might require a shift into services or other kinds of production” (LEONARD, 2000). In the long run higher taxes and more expensive inputs reduce the productivity and competitiveness of the ‘net payer’ sectors, reducing budget income and overall economic growth in Ukraine. The problem of export competitiveness is exacerbated in Ukraine by the delays in refunding export VAT and the accumulated export VAT arrears of recent years. By the end of 2003, the government’s export VAT arrears amounted to 6 bUAH, including 2.1 bUAH that were overdue. Total farm VAT exemptions between 1999 and 2001 amounted to 2 bUAH, which is equivalent to roughly 30% of the export VAT arrears. Hence, it is reasonable to expect that if agriculture had been paying ‘its share’ of VAT, the problem of export VAT arrears (essentially a tax on Ukrainian exports, including agricultural exports) could have been at least partly avoided.

5.2 The impact of the farm tax system on agricultural sector in Ukraine

Beside its macroeconomic effects, the farm tax system in Ukraine affects farm size and structure, the input mix, output diversification, the use of tax shelters and the ability of the state to provide public goods in rural areas. An important element of agricultural taxation in Ukraine is the FAT, which has several advantages for agriculture beside the fact that it is applied at a low rate and therefore places relatively little burden on farmers:

- The FAT is relatively simple to calculate if land areas, land values, and tax rates are known. Given the complexity of the tax system in Ukraine, the simplification of the farm tax system that resulted from the introduction of the FAT represents a major improvement. Simplicity reduces the costs of tax calculations and allows farmers to make long-term plans. It also reduces ambiguities in the tax system, which is important because these ambiguities give tax and local authorities discretionary power that in the past has often been used as an excuse for interfering in the management of farms.

3 Tax privileges for agriculture also affect macroeconomic variables such as the real exchange rate, which in turn influence the international competitiveness of Ukrainian exports (including agricultural goods). Chapter 4 The Linkages between Agriculture and Macroeconomic Development in Ukraine discusses the role of the real exchange rate in farm price determination.
The FAT does not require that farms carry out complex tax accounting. Whether this is an advantage or not is debatable. On the one hand it reduces costs for farms. On the other hand, however, farms need good accounting systems if they are to make good decisions and gain access to credit. In the long run, especially the large farms in Ukraine can be expected to keep books according to international standards, for their own good.

The FAT could be a good tax for the private subsidiary household plots in the future. These plots usually involve a few hectares of land or several cows. Unlike the large agricultural enterprises, they cannot be expected to keep detailed books, and the land tax would be a low-cost way to tax their income.

Some defenders of the FAT say that it raises the efficiency of land use (see SEROVA et al., 2000) as it places a larger burden on less efficient land users and puts more efficient users in a position to offer higher rental payments on the market for leased land. In principle this is true, but the key is the tax rate that the land user has to pay. If this rate is low, the advantage that the FAT conveys to efficient land users will be small, and the FAT will probably have little practical impact on the efficiency of land use.

Farm tax exemptions or simplifications within the framework of the general taxation system are not considered to be so-called ‘amber box’ subsidies by the World Trade Organisation (WTO). Hence, they are not subject to the reduction commitments that apply to amber box subsidies. The Government of Ukraine, therefore, may use tax exemptions to support agriculture without having to make any commitments to reduce them if and when Ukraine joins the WTO.

Finally, under the FAT farmers do not have the incentives to hide sales/production and/or pay wages in-kind that they do under taxes that are calculated on the basis of sales, profits and wage costs. This can lead to a ‘de-shadowing’ of the agricultural economy and more accurate statistics on production and sales, etc.

These positive effects of the FAT, however, are countervailed by several negative effects. These include:

The success of agricultural development hinges among other things on the provision of public goods such as research, education, extension, social services and infrastructure. In Ukraine, investments in such goods and/or systems that can provide them are desperately needed to close the productivity gap between farming at home and in the rest of the world, and to increase standards of living in the rural areas. FAT and VAT exemptions for agriculture reduce the ability of the state to invest in these goods. The result is a loss of agricultural competitiveness in the long run. Furthermore, large farms are often obliged to continue providing some of these goods (the so-called ‘social sphere’) which binds resources and reduced their competitiveness further.

The FAT does not comply with the principle of vertical equity (see section 2.2). On the contrary; the more profit a farm makes, the lower its relative tax burden. This

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4 See Chapter 11 Farm Management Challenges in Ukrainian Agriculture for a discussion of challenges to farm management in Ukraine, including the need to improve accounting tools.
• Farmers pay the same amount of FAT each year, regardless of whether profits are high, low or even negative. Hence, the FAT has no auto-stabiliser effect (Leonard, 2000). Even though the FAT rate is low, the destabilising impact on farms that are just marginally profitable can be significant, leading to liquidity problems. This is especially important in Ukraine, where farms have little access to risk management tools such as futures markets or effective crop insurance.

• The FAT places a different burden on farms in different regions. Consider two oblasts with similar climatic conditions and land quality such as L’viv and Ivano-Frankivsk. Average farm profitability was 33 UAH/ha in the former in 2000, and 72 UAH/ha in the latter. Nonetheless, the average FAT per hectare of agricultural land in L’viv was just 20% less than in Ivano-Frankivsk (SSCU, 2001; MAPU, 2002). Current land productivity differs from the productivity ten years ago that serves as the basis of FAT calculation, leading to arbitrary distortions.

• The FAT is biased against crop producers. It is true that livestock producers often utilise pastures and/or cultivate arable land to produce feed crops. Nevertheless, the tax burden per unit of cost, revenue or profit will be higher for crop producers than for livestock producers. Some livestock producers with next to no land (e.g. an intensive poultry or pig operation) will pay next to no FAT. On average, livestock production in Ukraine is unprofitable, so policymakers often claim that it requires state support. This might be seen as justifying the favourable treatment it receives under the FAT. However, what is true for the average need not be true for each of the parts, and some livestock producers in Ukraine are obviously getting off very easy under the current system.

• The provision of the FAT Law according to which an enterprise is deemed agricultural if at least 75% of its revenue stems from sales of own agricultural and processed products (until 2004 the threshold was 50%), creates incentives for the creation of artificial structures involving farms and non-agricultural enterprises that are looking for ways to avoid paying taxes. Increasing the threshold from 50 to 75% has presumably reduced these incentives, but distortions will remain all the same. Of course, this is not a disadvantage of the FAT per se, but rather a consequence of the overall low level of taxation in agriculture compared with other sectors.

• The FAT encourages the retention of labour in agriculture, because agricultural employers do not have to make contributions to payroll taxes per person employed. Agricultural employment is already high in Ukraine, accounting for 22% of total employment (SSCU, 2001), and labour productivity is very low. Even without the influence of the FAT, agriculture in Ukraine has served as a buffer against low employment opportunities in other sectors, and this has hampered restructuring and productivity growth in the sector. The FAT aggravates this problem not only because it does not place any tax burden on labour use in agriculture, but also because, as

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3 See Chapter 11 Farm Management Challenges in Ukrainian Agriculture for data on labour intensity and productivity in Ukrainian crop production.
outlined above, low rates of taxation in agriculture lead to higher taxation and less job creation in the rest of the economy.

6 Conclusions and policy recommendations

Taxes play an important role in market economies. Taxes influence the distribution of income (and wealth) and the allocation of resources, and they can contribute to stabilising the economy. Tax systems are expected to ensure tax neutrality across sectors and generate stable and sufficient tax revenue to finance government social expenditure and public good provision. Tax systems are also expected to ensure vertical equity and should not generate incentives that lead to the proliferation or migration of activities in the shadow economy.

Agriculture can be taxed in different ways. Usually governments tax individual and corporate incomes, value-added, and agricultural land. Farm taxation affects the number, size and structure of farms, as well as their input and output mixes. Simple and transparent tax systems tend to be the most efficient, while complexity increases the costs of tax compliance and can lead to discretionary power and interference on the part of tax authorities.

The farm tax system in Ukraine creates significant privileges for agricultural producers, especially in the form of FAT and VAT exemptions. These privileges have a negative influence on the rest of the economy in Ukraine because they increase the tax burden that other sectors must bear. In agriculture, the simplicity and transparency of the FAT certainly reduces the costs of tax compliance. Furthermore, the low rate at which the FAT is applied increases farm profitability. However, the FAT does not comply with the principles of neutrality and vertical equity. It is biased in favour of profitable farms and land-intensive agriculture such as livestock farming. It encourages the retention of labour and reduces incentives for the introduction of up-to-date accounting systems on farms. As a result of the farm tax system, the state lacks the funds required to provide important public goods in rural areas. Altogether, the farm tax system in Ukraine does not contribute to the creation of sustainable agricultural sector.

To improve the farm tax system in Ukraine, we recommend the following changes:

• The government should adopt a new farm tax system based on farm incomes. Large farms should be expected to use modern bookkeeping systems and keep accurate records of their incomes and expenditures. Hence, the cost of complying with an income tax should not be excessive. Of course, the cost of tax compliance will be high if farms are forced by punitive or discretionary tax rates to keep two sets of books; one for tax purposes and one that reflects reality for management purposes. Hence, the rate of taxation must be reasonable. Furthermore, it is imperative that farmers be free to manage their farms and that local authorities refrain from interfering in farm production, investment and marketing decisions.

• VAT privileges should be abolished to avoid macroeconomic and sectoral distortions, as well as indirect effects on farm-gate prices.

• Agricultural policy makers should pay more attention to rural development. The welfare of farm employees depends on not only gross output and farm prices, but also on access to education, health care, other social infrastructure and off-farm opportunities. While farms should pay considerably more taxes than they have in the
past, they will only be prepared to do so if they feel that they are benefiting from the government activities that are financed with these taxes. For example, the state should take over the ‘social sphere’ functions that large farms have assumed by default from Soviet times.

- The government could continue using the FAT for small farms or private households. The FAT provides a tool for tapping into the substantial economic activity that takes place on small farms and household plots without incurring large costs of tax compliance and monitoring.

- Finally, the farm tax burden must be harmonised with the tax burden in the rest of the economy. The current privileges provided to agriculture represent a significant tax on the rest of the economy that is largely hidden. If agriculture is to be supported, this support should be provided ‘up front’ in the form of expenditure out of a budget that is funded evenly by all sectors of the economy.

7 References


4 The Links between Agriculture and Macroeconomic Development in Ukraine

SERGIY ZORYA

1 Introduction

Farming is an undertaking that involves many decisions. What crops to plant, how much inputs to purchase and how much credit to borrow, when and how to plough, seed, cultivate, or harvest, how much to keep for own consumption, how much to sell, and how much to store for later sale: these decisions make up the daily routine of most agricultural producers. In contrast to the planned economy, where farming decisions are based on the directives of a small group of planners, in market economy farming decisions are mainly driven by prices. Price incentives guide factor allocation, technical change, and thus, they affect agricultural growth. To ensure an efficient allocation of resources, it is essential that the price system functions and is protected from macroeconomic disorder.

Macroeconomic policy, therefore, plays an important role in creating conditions for sending undistorted price signals to the agricultural sector. The most influential macroeconomic variable influencing the agriculture is the real exchange rate (RER). This variable is often used in the literature on the effects of macroeconomics on agriculture (SCHUH, 1974; SCHIFF & VALDES, 1999). Policy makers cannot directly set the RER, but they can influence it via fiscal, monetary, trade, and structural policies. The RER serves as a sort of barometer of general macroeconomic conditions and reflects the quality of economic policy.

This chapter discusses the linkages between agriculture and macroeconomic variables, and evaluates the effects of macroeconomic policy on agricultural incentives in Ukraine. We begin with a brief literature review on the RER and agriculture. The role of the RER in a small open economy and the effects of the RER, together with industrial protection, on farm relative prices are discussed in Section 3. Section 4 presents estimates of the Equilibrium RER and RER misalignment in Ukraine. The direct and indirect policy effects of this misalignment on relative agricultural prices in Ukraine are estimated in Section 5, and Section 6 concludes.

2 Literature review

The impact of the RER on agriculture is a popular topic in the economic literature. It has being intensively studied for both developed and developing countries, but less so for transition economies. No doubt, the most important paper on exchange rates, other macroeconomic phenomena, and agriculture is the classic paper by EDWARD SCHUH entitled “The Exchange Rate and US Agriculture” (SCHUH, 1974). The basic idea of SCHUH’s paper is that US exchange rate policy during the post-war era effectively taxed agricultural exports, thus reducing agricultural exports, prices, incomes, returns to farm labour, and ultimately agricultural land values.

Confirming SCHUH’s findings, SHANE (2001) indicates that past exchange rate shifts have accounted for approximately 25% of the changes in US agricultural export value.
Other factors, such as income growth rates in developing countries, the growth and productivity of foreign agricultural sectors that compete with the US and weather conditions accounted for much of the rest. Since 1995 the appreciation of the US dollar has again become a handicap for US agricultural exports. According to the author, appreciation of the dollar was a major factor in the 2% decline in global share of all US agricultural exports between 1992 and 1998.

Exchange rate issues were always important for European farmers as well. The very complicated EU agri-monetary system, a system primarily designed to avoid agricultural price reductions in EU member states with strong currencies (such as Germany) kept exchange rate issues near the top of the EU’s Common Agricultural Policy (CAP) agenda for over two decades. The introduction of Euro (€) in 1999 made it possible to eliminate the agri-monetary system in all members of the EU’s Monetary Union, but ushered in several new challenges. Exchange rate movements have an important impact on the costs of financing the CAP. A substantial part of CAP expenditures is directed to financing export subsidies. The value of the export subsidies depends on the difference between world market prices (usually denominated in US$) and internal EU prices (denominated in €). In 2001 and 2002, the € was weak vis-à-vis the US$, reducing the gap between world and internal EU prices and thus the cost of export subsidisation (see AGRITRADE, 2002).

In the developing countries, discussions on the impact of macroeconomic policy on agriculture were triggered by attention to the anti-agricultural bias of industrialisation policy. “In the 1960-70s the agrarian society by its very nature was regarded as socially and economically backward, governed by tradition, impervious to market signals, and devoid of links to other sectors that could bring the benefits of progress in agricultural production to the economy as a whole” (SCHIFF & VALDES, 1999, p. 4). Hence, many thought that only industrialisation policies could achieve long-term economic growth. DIAZ-ALEJANDRO (1970) used relative prices to examine the impact of industrial protectionism on agriculture in Argentina during 1930-1964. He found that this protectionism created a significant bias against agriculture. LITTLE et al. (1970) compared domestic value-added and value-added at world prices in seven developing countries in the 1950s and 1960s. “They found in several countries extremely high levels of manufacturing protection, e.g. 313% in India in 1961 (the lowest being 27% in Mexico in 1960). In four of the seven cases, nominal protection exceeded 100%, far higher than could be justified by those who argued in favour of protection of infant industries” (cited in SCHIFF & VALDES, 1999, p. 14).

In the 1980s, greater attention began to be paid to the impact of the RER on agricultural development in the developing countries. KRUEGER et al. (1988) and SCHIFF & VALDES (1992) adapted the ‘elasticity’ approach to exchange rate determination in conjunction with an explicit treatment of non-agricultural prices. These works explored the combined effect of direct (sector-specific) and indirect (economy-wide) policies on agriculture in a sample of eighteen developing countries. The authors found that the impact of indirect taxation generally exceeded that of direct taxation. The total taxation of agriculture in the studied countries equalled 30%, of which 8% were due to direct price interventions, and 22% to indirect taxation through macroeconomic policy and overvalued

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1 For an overview of the evolution of the agri-monetary system, see VON CRAMON-TAUBADEL (1994).
RERs. The authors also found that high taxation of agriculture was associated with low growth of agriculture and of the whole economy.

There is little applied research on the impact of the RER on agriculture in transition economies. This is surprising given the vast macroeconomic changes in these countries over the last decade. Exceptions are Bojneč et al. (1997) and Hartell & Swinnen (2000). The latter explain the level of agricultural protection defined in terms of the Producer Subsidy Equivalent (PSE) in Estonia, Czech Republic, Hungary, Poland, Slovenia, and the Slovak Republic for the period 1992-1996 using the RER, relative income, the structure of the economy, the net agricultural trade position, and institutional structure. They find that changes in the RER have a statistically significant and large impact on the level of agricultural protection and that lower RERs are usually associated with higher farm support.

Finally, the impact of the recent 1997/98 financial crisis on agriculture in Eastern Europe has been a popular issue. In Russia the crisis triggered large-scale capital outflow, depreciation of the ruble against the US dollar from August to December 1998 of about 75%, high inflation (120% from August 1998 to July 1999), and falling GDP (a drop of 5% in 1998). The crisis lowered food consumption for two reasons: substantial depreciation of the rouble raised domestic prices for foodstuffs, and the crisis reduced consumer wealth and income. However, the crisis helped rather than hurt Russian agriculture because Rouble depreciation improved the price competitiveness of tradable goods. Although the depreciation also raised prices for some tradable agricultural inputs such as energy, these inputs account for only a certain fraction of the value of most of agricultural outputs. Hence, Liefert (2000) finds that Russian agriculture’s terms of trade improved by about 35% between August 1998 and early 1999.

3 Theoretical foundations

In this section, the Dependent Economy Model (DEM) is used to explain the role of the RER in an open economy.

3.1 The Dependent Economy Model

The DEM is derived from the works of the Australian economists Meade, Salter & Swan, and is extensively used to analyse trade and exchange rate issues. The DEM model assumes a small open economy producing two types of goods, tradable and non-tradable. The economy consumes both domestically produced goods and imports ($M$). Imports are a substitute for and therefore compete with domestically produced goods. The level of exports ($X$) is determined by the excess supply of the exportable tradable goods over domestic consumption. For simplicity it is assumed that all three goods are final products so as not to complicate the model with intermediate goods. Exports and imports are aggregated into total tradables ($T = X + M$). Non-tradable goods ($N$) are consumed only domestically.

The prices of the tradable goods ($P^*_X$ and $P^*_M$ – throughout, an asterisk indicates foreign or world market prices) are determined exogenously on the world market, and the assumption of a small open economy implies that a country has no influence on these prices.

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2 See original model in Meade (1951), Salter (1959) and Swan (1960).
Domestic prices of tradable goods are derived from these world market prices, via the exchange rate and the relevant trade policy instruments:

\[ P_M = E P_M^* [1 + t_M], \quad (4.1) \]

where \( E \) is the nominal exchange rate and \( t_M \) is the implicit tariff rate which is negative in the case of an import subsidy. Similarly:

\[ P_X = E P_X^* [1 - t_X], \quad (4.2) \]

where \( t_X \) is the export tax, which positive in the case of an export subsidy.

The prices of domestically produced non-traded goods (\( P_N \)) are determined solely by domestic supply and demand, as well as by production costs and fiscal and monetary policy instruments that influence domestic prices. Finally, the model is based on the assumptions that prices and wages are flexible, and that there is full employment. “This assumption can be relaxed on the premise that any rigidity in the non-tradable price, for instance, will result in excess supply of N and consequently unemployment” (see CORDEN, 1997, p. 263). Capital is assumed to be fixed in each sector at least in the short run, so that the mobile factor in the model is labour.

To derive the equilibrium properties of the model, \( X \) and \( M \) are aggregated into one composite tradable good (\( T \)) the price of which is determined by the following equation:

\[ P_T = \beta P_M + [1 - \beta] P_X, \quad (4.3) \]

where \( \beta \) is the share of \( M \) in \( T \). This aggregation makes it possible to derive the key variable of interest in the model, the RER (\( e \)) which is defined as the ratio of tradable prices to non-tradable prices:

\[ e = P_T / P_N. \quad (4.4) \]

Overall equilibrium in the model requires the simultaneous achievement of external and internal equilibrium, i.e. equilibrium in the tradable and non-tradable markets. The non-tradable market is in equilibrium when domestic demand equals domestic supply. The demand for non-tradables (\( D_N \)) is a function of the RER and a domestic absorption (\( A \)), which is in turn defined as a sum of domestic private consumption (\( C \)), investments (\( I \)) and state consumption (\( G \)). An increase in the RER (i.e. a devaluation) makes non-tradables cheaper relative to tradables (see equation (4.4)) and thus leads to an increase in demand for \( N \). If the RER falls (i.e. appreciates), the opposite is true. The demand for non-tradables is defined as follows:

\[ D_N = D_N (P_T / P_N, A), \quad \frac{\partial D_N}{\partial e} > 0, \quad \frac{\partial D_N}{\partial A} > 0 \quad (4.5) \]

The supply of non-tradable goods (\( S_N \)) is solely a function of the RER – a rise in the RER induces a reduction in the production of \( N \) as \( P_N \) falls relative to \( P_T \). Since prices are assumed to be flexible, the market for non-tradable goods always clears.

\[ S_N = S_N (P_T / P_N), \quad \frac{\partial S_N}{\partial e} < 0 \quad (4.6) \]

Equilibrium in the tradables market is similarly derived by defining supply and demand. The demand for tradables (\( D_T \)) is affected by changes in the RER and in domestic absorption. RER devaluation makes \( T \) more expensive for domestic consumers, inducing
lower consumption of $T$ as they shift demand to $N$. RER appreciation has the opposite effect.

$$D_T = D_T (P_T/P_N, A), \frac{\partial D_T}{\partial e} < 0, \frac{\partial D_T}{\partial A} > 0$$  \hspace{1cm} (4.7)

The supply of tradable goods ($S_T$) is determined by the RER alone. The RER determines the relative profitability of the production of tradables and consequently the movement of production factors between sectors that produce $T$ and $N$.

$$S_T = S_T (P_T/P_N), \frac{\partial S_T}{\partial e} > 0$$  \hspace{1cm} (4.8)

The equilibrium condition for tradable goods is not as strict as for non-tradable goods. The trade balance ($TB$) is allowed to deviate from 0 in the short run, because in reality short-term trade imbalances exist and are often financed by capital inflows (which are excluded from the basic model for simplicity). In the long run, however, trade imbalances are not allowed. $TB$ is defined as:

$$TB = S_T (P_T/P_N) - D_T (P_T/P_N, A).$$  \hspace{1cm} (4.9)

Overall equilibrium in the economy is attained by deriving aggregate supply and demand equations. Total supply in the economy ($Y$) is the sum of tradable ($S_T$) and non-tradable ($S_N$) supply. Measured in terms of non-tradable goods this can be expressed as:

$$Y = S_N (P_T/P_N) + e S_T (P_T/P_N).$$  \hspace{1cm} (4.10)

RER depreciation (a rise in the relative price of tradable goods) is expected to increase the supply of tradables through both income and substitution effects. It is also expected to reduce the supply of non-tradables because of the dominance of substitution over income effects (CORDEN, 1997).

Total absorption ($A$) in the economy is derived from the demand functions for $T$ and $N$:

$$A = D_N (P_T/P_N, A) + e D_T (P_T/P_N, A).$$  \hspace{1cm} (4.11)

Overall equilibrium is attained when total income and total absorption are equal. The RER is the key relative price that makes this possible by inducing changes in supply and demand (absorption):

$$Y - A = (S_N - D_N) - e (S_T - D_T).$$  \hspace{1cm} (4.12)

Overall equilibrium in the DEM is illustrated graphically in figure 4.1. $NN$ and $TT$ are the sets of all points at which the non-tradable and tradable goods markets, respectively, are in equilibrium. Full equilibrium is obtained at point $S$ where there is balance both on the domestic market for tradable goods, and in foreign trade. To understand this, recall that $e$, the RER, is the relative price of tradable to non-tradable goods. $NN$ slopes down, because as $e$ falls, non-tradable goods become relatively more expensive so that domestic demand shifts from non-tradable to tradable goods (equation (4.5)) and domestic supply of non-tradable goods increases (equation (4.6)). Since demand for non-tradable goods is falling while supply in increasing, more total absorption ($A$) is required, ceteris paribus, to equilibrate this market. Hence, points above (below) $NN$ are characterised by too much (too little) absorption for a given level of $e$, which leads to excess demand (supply) for non-tradable goods. Similarly, $TT$ slopes upwards because as $e$ increases, tradable goods become
relatively more expensive and more total absorption is required, *ceteris paribus*, to balance the resulting decreasing demand (equation (4.7)) and increasing supply of tradable goods (equation (4.8)). As a result, points above (below) $TT$ are characterised by too little (too much) domestic absorption for a given level of $e$, which leads to excess supply (demand) of tradable goods and a corresponding trade balance surplus (deficit).

**Figure 4.1: Overall equilibrium in the Dependent Economy Model**

Deviations from the point $S$ are grouped into four zones which SWAN (1963) calls “Zones of Economic Unhappiness”. Each zone is characterized by a unique combination of disequilibria on the tradable and non-tradable goods markets. For example Zone IV combines excess demand for both tradable and non-tradable goods. Zone IV depicts the situation in Ukraine prior to the financial crisis in 1998 very well. At the time, the country experienced a huge trade balance deficit as the nominal exchange rate was fixed which, combined with high inflation made Ukrainian import substitutes and exports uncompetitive on domestic and foreign markets, respectively. At the same time, the demand for non-tradable goods was artificially high due to high budget deficits and the consequent capital inflows. The economy was a long way from equilibrium, and policy makers were obliged to reduce and switch expenditures at the same time. The financial crisis ‘helped’ them to do both:

1. Since private investors refused to continue financing the budget deficit, the government had to reduce expenditures, improve the fiscal discipline, and consequently, balance the budget, achieving a surplus for the first time since independence in 2000.

2. Since the government could not any longer satisfy the demand for foreign currency at the artificially low fixed nominal exchange rate, the exchange rate began floating and devalued from 2 UAH/US$ in mid-1998 to almost 5 UAH/US$ by late 1999. Nominal devaluation improved the competitiveness of Ukrainian import substitutes and export goods on domestic and international markets, respectively. Domestic
demand therefore switched from imports to import substitutes and non-tradable goods.

Altogether, these changes reduced domestic absorption as both the private and public sectors in Ukrain were ‘forced to live within their means’. Devaluation of the RER – in other words, an increase in the prices of tradable goods relative to non-tradable goods – signalled to the Ukrainian economy that domestic demand should switch from tradable to non-tradable goods and supply (production) from non-tradable to tradable goods. This moved the economy first to the ‘north-west’ in figure 4.1, correcting the trade deficit, while stimulation of production of non-tradable goods and overall productivity improvements led to a combination of subsequent RER revaluation and a shift of the \(NN\) curve up and to the right. Together, these changes brought the Ukrainian economy closer to overall macroeconomic equilibrium, a fortuitous situation that has characterised the last roughly 4 years.

### 3.2 The exchange rate and agricultural prices

Since agricultural commodities are mainly tradable, agricultural prices and markets are clearly affected by the macroeconomic forces and changes described in the previous section. Agricultural prices are determined on world markets and are exogenous for small open economies. The world markets send price signals to domestic farmers, and based on these signals farmers make production and investment decisions. The transmission of price signals from world to domestic markets, however, can be distorted by border control and other restrictive trade policy tools. To measure these distortions, economists use the Nominal Rate of Protection (NPR) which is defined as:

\[
NPR = \frac{P_d}{P_w} - 1
\]  

(4.13)

where \(P_d\) is the domestic farm-gate price and \(P_w\) is the border price (\(P_{bp}\)) converted into local currency at the official nominal exchange rate (\(E_0\)) (i.e. \(P_w = E_0 P_{bp}\)) and adjusted for marketing costs (transportation, storage, quality differences etc.). A negative NPR implies that domestic farm-gate prices are lower than they would be without distortions (i.e. taxation of domestic producers) while a positive NPR implies the opposite, i.e. that domestic prices are supported.

KRUERGER, SCHIFF & VALDES, however, argue that this measure of price distortion is incomplete and propose modifying it to account for (a) effects of industrial policy via the prices of non-agricultural products (\(P_{na}\)), and, as described above, (b) any difference between the actual (\(e_0\)) and equilibrium exchange rates (\(e^*\)) that might be due to macroeconomic policies (see KRUERGER et al., 1988; SCHIFF & VALDES, 1992 and 1999). Farm profitability hinges on not only farm output prices but also industrial input prices (e.g. machinery, fuels). Since the ‘classical’ NPR does not account for the fact that the latter may be distorted by government policies (e.g. import duties on farm machinery, which effectively tax domestic farmers), KRUERGER-SCHIFF-VALDES propose adjusting the NPR accordingly. Moreover, the ‘classical’ NPR also assumes that the economy is in equilibrium, in other words that the actual and equilibrium exchange rates are equal. However, if the economy is in disequilibrium, the actual RER will deviate from its equilibrium level, and this will also imply taxation or support of agriculture. For example, prior to the financial crisis, RER overvaluation reduced the competitiveness of Ukrainian
agriculture – budget deficits, the fixed nominal exchange rate and other unsustainable macroeconomic policies acted as a hidden tax on farmers in Ukraine. The ‘classical’ NPR cannot capture effects of this nature either, which also calls for an adjustment. Hence, KRUEGER, SCHIFF & VALDES propose direct, indirect and total NRPs.

The direct NPR (NPR\textsubscript{D}) is defined as:

\[
NPR\textsubscript{D} = \frac{P_d}{P_{na}} - \frac{P_w}{P_{na}} = \frac{P_w}{P_{na}} - \frac{P_w}{P_{na}} - 1.
\]

\[
= \frac{P_w}{P_{na}} - \frac{P_w}{P_{na}} - 1 = \frac{P_w}{P_{na}} - 1.
\] (4.14)

where \(P_w^*\) is the border price in the local currency adjusted for exchange rate misalignment \((e^*/e_0)\) so that \(P_w^* = P_w e^*/e_0\). \(P_{na}\) is non-agricultural price which consist of a tradable share \(\beta\) with a price \(P_{naT}\) and a non-tradable share \(1-\beta\) with a price \(P_{naNT}\), so that \(P_{na} = \beta P_{naT} + [1-\beta]P_{naNT}\). \(P_{na}^*\) is the corresponding non-agricultural sector price corrected for exchange rate distortions \((e^*/e_0)\) and any protectionist measures (measured by the tariff equivalent \(t_{na}\)). Hence, \(P_{na}^* = \frac{\beta P_{naT} e^*}{e_0[1+t_{na}]} + [1-\beta]P_{naNT}\). The direct NPR measures the impact of direct policies \((P_d-P_w)/P_{na}\) relative to the agricultural price that would prevail in the absence of all interventions \((P_w^*/P_{na}^*)\).

The indirect NPR (NPR\textsubscript{I}) is defined as:

\[
NPR\textsubscript{I} = \frac{P_w}{P_{na}} - \frac{P_w}{P_{na}} - 1 = \frac{P_w}{P_{na}} - 1 = \frac{P_w}{P_{na}} - 1.
\] (4.15)

The NPR\textsubscript{I} measures only indirect distortions of agricultural prices caused by macroeconomic and industrial trade policies, including RER misalignment \((e^*/e_0)\) and the effect of trade policy on prices of tradable non-agricultural goods \((P_{naT})\). NPR\textsubscript{I} is the same for all tradable products since \(P_d\) does not appear in equation (4.15).

The total NPR (NPR\textsubscript{T}) is the sum of direct and indirect NRPs and measures the impact of both direct and indirect policies on agricultural prices \(((P_d-P_w)/P_{na})\) relative to the agricultural prices that would prevail in the absence of all interventions \((P_w^*/P_{na}^*)\):

\[
NPR\textsubscript{T} = NPR\textsubscript{D} + NPR\textsubscript{I} = \frac{P_d}{P_{na}} - \frac{P_w}{P_{na}} + \frac{P_w}{P_{na}} - \frac{P_w^*}{P_{na}^*} = \frac{P_d}{P_{na}} - \frac{P_w}{P_{na}} - \frac{P_w^*}{P_{na}^*}.
\] (4.16)

4 The equilibrium real exchange rate in Ukraine

The key issue in measuring the effects of macroeconomic policies on agricultural prices is the evaluation of the equilibrium RER \((e^*)\) and the deviation of actual RER \((e_0)\) from its equilibrium value. This deviation is referred to as ‘misalignment’. RAZIN and
COLLINS (1997, p. 1) call RER misalignment “a situation in which country’s actual RER deviates from some notion of an implicit ideal RER”. In the following, we model and estimate the ERER and, consequently, the RER misalignment in Ukraine.

### 4.1 Modelling the equilibrium exchange rate

There are many methods used in the literature to evaluate the ERER. We use the EDWARDS’s model (EDWARDS, 1989; EDWARDS & SAVASTANO, 1999). EDWARDS distinguishes between variables which influence the RER in the short and in the long run. The long-term variables are called ‘fundamentals’, and they determine the ERER. Whenever there are changes in these variables, there will be changes in the ERER. “In the short run, however, changes in monetary variables, such as domestic credit and nominal devaluation, will also affect the RER” (EDWARDS, 1994, p. 67). The long-term ERER can be written in the following form:

\[
\ln(e_{LRt}) = \beta_0 + \beta_1 \ln(FUND_{it}) + u_t, \tag{4.17}
\]

where \(e_{LRt}\) is the ERER and \(FUND_{it}\) is the vector of fundamental variables. In the short run the RER may deviate from the ERER due to temporary fluctuations of the real fundamentals as well as monetary and fiscal policies. The short-term path of the RER is defined as follows:

\[
\Delta \ln(e_t) = \Theta[\ln(e_{LRt}) - \ln(e_{t-1})] - \lambda[Z_t - Z^*] + \Theta[\ln(E_t) - \ln(E_{t-1})], \tag{4.18}
\]

where \(\Theta\) measures what proportion of any misalignment between the ERER and the RER is ‘corrected’ in each period (the smaller \(\Theta\), the slower the correction), \(Z_t\) is a vector of macroeconomic policies, \(Z^*\) is a vector of macroeconomic policies that are consistent with the ERER, \(\lambda\) is the speed of adjustment to the sustainable policy value, and \(E_t\) is the nominal exchange rate. The meaning of this dynamic equation is straightforward: the RER changes or adjusts in the direction of the ERER (first term on the right hand side) depending on the size of the misalignment and the speed of adjustment \(\Theta\). However, deviations between actual and sustainable levels of macroeconomic policy variables (second term), and changes in the nominal exchange rate (third term), can disturb this adjustment.

Combining equations (4.17) and (4.18) leads to the following equation for the RER:

\[
\Delta \ln(e_t) = \gamma_0 + \gamma_1 \Delta \ln(FUND_{it}) + (1 - \Theta)\ln(e_{t-1}) - \lambda(Z_t - Z^*) + \Theta NOMEDEV_t + v_t, \tag{4.19}
\]

where the parameters \(\gamma_i\) are combinations of the respective \(\beta_i\) and \(\theta\), and \(NOMEDEV_t\) is the nominal devaluation. In order estimate equations (4.17) and (4.19), the variables affecting the ERER and RER need to be identified. According to EDWARDS & SAVASTANO (1999), most empirical studies of the ERER for emerging economies consider the following fundamentals: terms of trade, output growth (or productivity differentials), the country’s openness to international trade, import tariffs, government spending and capital flows. The monetary and fiscal variables, as well as the nominal exchange rate, are usually included to reflect short-term movements of the RER.

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3 See ZORYA (2003) for details on this literature and the following estimation.
We use the quarterly data from 1996 to 2001 from various statistical sources in Ukraine (NBU, 2002; UEPLAC, 2002). Based on data availability and quality, the following variables are used to estimate the ERER in Ukraine:

- **The real exchange rate (RER)** defined as the ratio of the US wholesale price index and consumer price index in Ukraine multiplied by the nominal UAH/US$ exchange rate (UAH/US$). An increase (decrease) of the RER means the RER depreciation (appreciation).

- **Openness of economy to international trade (OPEN)** defined as the ratio of the sum of total export and imports to nominal GDP. Trade barriers or all sorts affect the ERER. For example, an increase in import tariffs will increase the relative price of importable goods, reducing import demand and lowering the price of foreign exchange. According to theory, increasing of openness will lead to ERER depreciation (EDWARDS, 1994).

- **Government spending (GOV)** is measured as budget expenditures as a share of nominal GDP. Generally, increasing government expenditure leads to real appreciation by increasing demand and prices for non-tradable goods. But the ultimate impact on the long-term ERER depends on sectoral composition (tradable or non tradable sectors) of these changes (EDWARDS, 1994).

- **Capital flows (CAPFL)** are expressed as the ratio of net capital inflows to lagged nominal GDP. Capital inflows will lead to ERER appreciation if they inflate the prices of non-tradable goods, mainly fixed assets. However, if capital inflows are demanded domestically due to high GDP growth (and not, for example, to finance budget deficits), they can be non-inflationary.

- **Expansive monetary policy (EXCMON)** is proxied by the growth of domestic credit in excess of growth in lagged real GDP. Monetary policy is included in the RER analysis because of its impact on short-term RER movements; in the long run the money is neutral. Excessive monetary expansion unmatched by growth in the economy will boost the demand for non-tradable goods and thus, via inflation, induce an appreciation of the RER.

- **Fiscal deficit ratio (FISC)** is defined as the ratio of the fiscal deficit to the lagged monetary base. Under a flexible exchange rate, an increase in the fiscal deficit relative to the lagged monetary base (loose fiscal policy) will increase domestic demand for non-tradable goods, and thus lead to an appreciation of the ERER. Under a fixed exchange rate, loose fiscal policy will initially boost domestic demand with the upward pressure on interest rate dampened by capital inflows and no impact on the ERER. In the long run, the higher demand for non-tradable goods will put upward pressure on inflation, and thus lead to ERER appreciation (MONGARDINI, 1998).

- **Nominal devaluation (NOMDEV)** is the devaluation of the nominal exchange rate (UAH/US$). Nominal devaluation is a powerful tool to re-align the RER, but it affects the RER only in the short run. In the long run, if the fundamental sources of misalignment are not eliminated, the RER misalignment will increase again (EDWARDS, 1994).
4.2 Econometric estimation

In order to estimate equation (4.19), the two-step error-correction model (ECM) of Engel and Granger (1987) is used. The error correction specification makes it possible to measure the speed of adjustment to long-run equilibrium and short-term effects as well. In the first step of the Engel-Granger procedure, the following long-run relationship is estimated:

$$\ln(ERER_t) = \gamma_0 + \gamma_1 \ln(OPEN_t) + \gamma_2 \ln(GOV_t) + \gamma_3 \text{CAPFL}_{t-1} + u_t. \quad (4.20)$$

The results are summarised in Table 4.1. All coefficients have the expected signs and are statistically significant at conventional levels. Openness has a positive effect on the RER, indicating that an increase in openness leads to depreciation of the ERER. The results also indicate that increasing capital inflows induce ERER appreciation. The ratio of the government expenditures to GDP has a negative and significant elasticity, implying that the largest share of state expenditures is spent on non-tradable goods.

Table 4.1: Cointegrating regression, 1996Q1-2001Q4 (dependent variable is ln (ERER))

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>6.170</td>
<td>9.43</td>
<td>0.000</td>
</tr>
<tr>
<td>ln (OPEN)</td>
<td>1.062</td>
<td>6.85</td>
<td>0.000</td>
</tr>
<tr>
<td>ln (GOV)</td>
<td>-0.462</td>
<td>-2.65</td>
<td>0.015</td>
</tr>
<tr>
<td>CAPFL (-1)</td>
<td>-0.007</td>
<td>-1.93</td>
<td>0.068</td>
</tr>
</tbody>
</table>

R² = 0.93
DW statistics = 1.52
ADF(0) = -4.126 (**)
ADF (critical value at 1% significance) = -2.949

Source: Own calculations.

In step 2, deviations from the long run relationship in equation (4.20) are included in the following error-correction model:

$$\Delta \ln(ERER_t) = \gamma_1 \Delta \ln(OPEN_t) + \gamma_2 \Delta \ln(GOV_t) + \gamma_3 \Delta \text{CAPFL}_{t-1} - \lambda_1 \Delta \text{EXCMON}_t - \lambda_2 \Delta \text{FISC}_t + \theta \Delta \text{NOMDEV}_t - (1-\Theta) \Delta \ln(e_{t-1}) + u_t. \quad (4.21)$$

The estimated coefficients of this model are presented in Table 4.2. Despite the small sample size, most included variables are significant, and together they explain 71% of the observed changes in the RER. This indicates that real fundamentals as a group indeed play an important role in determining RER behaviour in Ukraine. The coefficient of the speed of RER adjustment to its equilibrium level is statistically significant: since $1-\Theta = 0.85$, $\Theta$ equals 0.15 which indicates that the RER converges quite slowly toward its long-run equilibrium level in Ukraine, with only approximately 48% of any misalignment being corrected within one year and full adjustment (99.9%) taking around 8 years.

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4 See Zorya (2003) for details on estimation method, diagnostic tests, etc.

5 This result is similar to those obtained by Edwards (1989) for a group of developing countries (0.19), Mongardini (1998) for Egypt (0.21), and Elbadawi (1994) for Chile, Ghana and India (around 0.30).
Table 4.2: Error correction regression, 1996Q1-2001Q4 (dependent variable is $\Delta \ln (\text{RER})$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ln (e_t)$</td>
<td>-0.853</td>
<td>-3.07</td>
<td>0.005</td>
</tr>
<tr>
<td>$\Delta \ln (\text{OPEN})$</td>
<td>0.834</td>
<td>3.86</td>
<td>0.004</td>
</tr>
<tr>
<td>$\Delta \ln (\text{GOV})$</td>
<td>-0.785</td>
<td>-2.74</td>
<td>0.012</td>
</tr>
<tr>
<td>$\Delta \text{CAPFL (-1)}$</td>
<td>-0.007</td>
<td>-3.05</td>
<td>0.005</td>
</tr>
<tr>
<td>$\Delta \text{EXCMON}$</td>
<td>0.148</td>
<td>0.86</td>
<td>0.198</td>
</tr>
<tr>
<td>$\Delta \text{FISC}$</td>
<td>-0.739</td>
<td>-2.42</td>
<td>0.010</td>
</tr>
<tr>
<td>NOMDEV</td>
<td>0.261</td>
<td>1.59</td>
<td>0.035</td>
</tr>
</tbody>
</table>

$R^2 = 0.71$

$DW = 1.26$

The first indicator of macroeconomic policy, EXCMON, has an unexpected sign, but is statistically insignificant. There is, therefore, no evidence of a relationship between monetary policy and the RER in Ukraine over the period 1996-2001. This result may be due to problems with our proxy for monetary policy, which is based on the assumption of a constant velocity of money. The second indicator of macroeconomic policy, FISC, is significantly negative. As expected, therefore, as fiscal policy becomes increasingly expansive, the RER will appreciate. According to the econometric results, budget deficit growth of 10%, *ceteris paribus*, leads to a 7.4% appreciation of the RER. This supports the view that inconsistent fiscal policies will result in growing pressure leading to RER overvaluation (EDWARDS, 1994).

The coefficient on nominal devaluation, NOMDEV, is significantly positive but of low magnitude, indicating that nominal exchange rate changes are converted into corresponding real changes at considerably less than a one-to-one rate. This highlights the point that while nominal devaluations can serve as a powerful device to realign the ERER, they cannot replace the need to correct the fundamental source(s) of any misalignment.

In table 4.2, the rate of openness and the ratio of government spending to GDP are significant and have the expected signs. The coefficient on OPEN is large (0.83), indicating that outward-oriented trade policy induces RER depreciation – this is true for increases in exports and imports. The impact of government spending (GOV) is also high (-0.79) and confirms that increasing government expenditures induces RER appreciation. Finally, an increase in capital inflows induces RER appreciation, although this impact (the elasticity equals -0.007) is much weaker than those of OPEN and GOV.

Figure 4.2 depicts the actual and equilibrium RERs in Ukraine, as well as the difference between these two rates (RER misalignment) during the observed period. The ERER and RER misalignment have been calculated using the econometric results above as outlined in ZORYA (2003). These results should be treated with caution as the use of quarterly data might create some bias, leading to overestimation of RER misalignment in some periods. Nevertheless, RER misalignment during the periods 1996 to 1998 and 1999 to 2000 is obvious.
Between 1996-Q2 and 1998-Q4, the RER was overvalued, with the rate of overvaluation peaking in 1997-Q4 (21.9%) and averaging 4.6, 16.2 and 5% in 1996, 1997 and 1998, respectively. In this period the Ukrainian economy was characterised by high government expenditures, unsustainable capital inflows, slow structural changes, and inward-oriented trade policy. The financial crisis in 1998-Q4 clearly demonstrated how macroeconomic mismanagement can be punished in an open economy. As discussed using the Dependent Economy Model in section 3 above, the only options available to the Ukrainian Government were exchange rate devaluation and a move towards more sustainable fiscal policies.

Nominal devaluation began in 1999, although the government tried to avoid a sharp devaluation. In 1999, the RER was undervalued by roughly 4.8% and in 2000-Q2, the rate of undervaluation reached 12.5%. In this period, the rate of openness reached its peak, state finances were balanced, and foreign capital flowed out of the country. In 2001, the actual RER returned to its appreciation path and was slightly overvalued by an average rate of 3%. As 2001 was the first year of strong GDP growth in Ukraine (9%), a certain degree of RER appreciation due to increasing productivity was to be expected, and the 3% overvaluation we find may not represent misalignment.

---

An attempt to capture this so-called Balassa-Samuelson effect in our econometric analysis using a variable that measures technical change (real industrial output per unit of labour employed in Ukraine) was not successful, perhaps because significant growth and productivity improvements only took place at the very end of our sample period. In a similar study, De Broeck and Slok (2001) estimate an impact of technical change on the RER that, if it were also true for Ukraine,
5 Impact of macroeconomic policy on agricultural incentives in Ukraine

We next evaluate the impact of RER misalignment and industrial protection on agricultural incentives in Ukraine using the Krueger-Schiff-Valdes methodology described in section 3.2. Nominal Rates of Protection (classical, direct, indirect and total) are calculated for nine agricultural products using data from the OECD (2003). The index of RER misalignment required for these calculations is taken from figure 4.2, and rates of industrial import protection are calculated as average import tariffs for industrial goods (without energy) increased by 20% to account for non-tariff barriers in Ukraine (Zorya, 2003, table 14). The share of tradable goods in total non-agricultural production is assumed to be 40%, while the share of non-tradable goods (construction, transportation, communication and other services) is correspondingly assumed to be 60% (calculations based on IMF, 2001). It is also assumed that all agricultural products are tradable: this assumption is very close to reality for crops in Ukraine, but it is not always true for livestock products produced by households. The results are summarised in table 4.3.

The results in table 4.3 show that macroeconomic policy and non-agricultural prices have a very important impact on agriculture. For example, the average classical NPR for wheat in Ukraine was 18.4% between 1996 and 2001. However, the corresponding total NPR, which accounts not only for agricultural policies but also includes the indirect effects of macroeconomic imbalances and non-agricultural policies, equals only 7.7%. This indicates that the classical approach of measuring price support overestimates the true protection rates; policy makers may feel that they are supporting agriculture via policy measures such as import tariffs on agricultural products, but this support is eroded and sometimes reversed by other, non-agricultural policies. This erosion peaked in 1997-1998 when RER misalignment was at its greatest, and reversal (i.e. where indirect taxation of agriculture exceeds direct support) can be observed for a number of products and years (for example wheat, sunflower seeds and beef and veal in 2001). This result is confirmed at the bottom of table 4.3 for exportable agricultural products as a whole. We see that in some years (1997, 1998 and 2001), the impact of macroeconomic and industrial policies on agricultural prices was larger than the impact of agricultural policy itself, suggesting that agricultural policy per se is often not responsible for the decisions and incentives that matter most to agriculture.

would have generated an RER appreciation of 3.6%. This suggests that RER misalignment was more or less zero in 2001.
Table 4.3: Direct and indirect nominal rates of protection for selected agricultural products in Ukraine, in %, 1996-2001

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat Classical NPR (NPR)</td>
<td>-42.3</td>
<td>121.7</td>
<td>24.4</td>
<td>-18.5</td>
<td>21.9</td>
<td>3.2</td>
</tr>
<tr>
<td>Direct NPR (NPR_D)</td>
<td>-43.7</td>
<td>83.3</td>
<td>17.9</td>
<td>-14.9</td>
<td>33.8</td>
<td>-0.1</td>
</tr>
<tr>
<td>Indirect NPR (NPR_I)*</td>
<td>-4.8</td>
<td>-10.8</td>
<td>-7.3</td>
<td>-1.4</td>
<td>0.4</td>
<td>-6.4</td>
</tr>
<tr>
<td>Total NPR (NPR_T)</td>
<td>-48.5</td>
<td>72.5</td>
<td>10.6</td>
<td>-16.4</td>
<td>34.2</td>
<td>-6.5</td>
</tr>
<tr>
<td>Maize NPR</td>
<td>-5.7</td>
<td>-18.5</td>
<td>-12.5</td>
<td>5.9</td>
<td>-13.5</td>
<td>-2.6</td>
</tr>
<tr>
<td>Direct NPR (NPR_D)</td>
<td>-5.5</td>
<td>-15.2</td>
<td>-12.4</td>
<td>7.0</td>
<td>-13.5</td>
<td>-16.7</td>
</tr>
<tr>
<td>Indirect NPR (NPR_I)*</td>
<td>-5.2</td>
<td>-5.7</td>
<td>-4.8</td>
<td>-1.4</td>
<td>0.4</td>
<td>-6.4</td>
</tr>
<tr>
<td>Total NPR (NPR_T)</td>
<td>-10.2</td>
<td>-26.0</td>
<td>-19.7</td>
<td>5.6</td>
<td>-16.5</td>
<td>-9.1</td>
</tr>
<tr>
<td>Barley NPR</td>
<td>-5.4</td>
<td>-0.1</td>
<td>17.8</td>
<td>-21.5</td>
<td>-10.7</td>
<td>-16.1</td>
</tr>
<tr>
<td>Direct NPR (NPR_D)</td>
<td>-5.2</td>
<td>-0.1</td>
<td>17.7</td>
<td>-25.6</td>
<td>-13.5</td>
<td>-16.7</td>
</tr>
<tr>
<td>Indirect NPR (NPR_I)*</td>
<td>-9.9</td>
<td>-10.9</td>
<td>10.4</td>
<td>-27.0</td>
<td>-13.1</td>
<td>-23.1</td>
</tr>
<tr>
<td>Total NPR (NPR_T)</td>
<td>-17.2</td>
<td>-16.8</td>
<td>-26.9</td>
<td>-32.2</td>
<td>-25.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Sunflower seeds NPR</td>
<td>-16.5</td>
<td>-13.7</td>
<td>-26.7</td>
<td>-38.2</td>
<td>-31.6</td>
<td>5.7</td>
</tr>
<tr>
<td>(sugar equivalent)</td>
<td>-21.3</td>
<td>-24.5</td>
<td>-34.0</td>
<td>-39.7</td>
<td>-31.2</td>
<td>-0.7</td>
</tr>
<tr>
<td>Sugar beet NPR</td>
<td>191.1</td>
<td>38.2</td>
<td>14.3</td>
<td>7.5</td>
<td>26.5</td>
<td>36.5</td>
</tr>
<tr>
<td>(dairy product equivalent)</td>
<td>183.7</td>
<td>31.2</td>
<td>14.3</td>
<td>8.9</td>
<td>33.4</td>
<td>37.8</td>
</tr>
<tr>
<td>Milk NPR</td>
<td>178.9</td>
<td>20.4</td>
<td>7.0</td>
<td>7.5</td>
<td>33.8</td>
<td>31.4</td>
</tr>
<tr>
<td>(dairy product equivalent)</td>
<td>-34.0</td>
<td>-1.9</td>
<td>-0.3</td>
<td>-27.7</td>
<td>-29.2</td>
<td>-26.3</td>
</tr>
<tr>
<td>Beef and veal NPR</td>
<td>-29.3</td>
<td>-1.5</td>
<td>-0.3</td>
<td>-33.0</td>
<td>-36.8</td>
<td>-23.7</td>
</tr>
<tr>
<td>(dairy product equivalent)</td>
<td>-34.0</td>
<td>-12.3</td>
<td>-7.6</td>
<td>-34.4</td>
<td>-36.4</td>
<td>-33.6</td>
</tr>
<tr>
<td>Pig meat NPR</td>
<td>-10.4</td>
<td>16.2</td>
<td>-21.8</td>
<td>-13.5</td>
<td>6.9</td>
<td>5.3</td>
</tr>
<tr>
<td>(dairy product equivalent)</td>
<td>-10.0</td>
<td>13.3</td>
<td>-21.7</td>
<td>-16.1</td>
<td>8.7</td>
<td>5.5</td>
</tr>
<tr>
<td>Poultry NPR</td>
<td>-14.8</td>
<td>2.5</td>
<td>-29.0</td>
<td>-17.5</td>
<td>9.2</td>
<td>-0.9</td>
</tr>
<tr>
<td>(weighted by production shares)</td>
<td>-12.4</td>
<td>29.9</td>
<td>2.6</td>
<td>-9.5</td>
<td>2.9</td>
<td>5.6</td>
</tr>
<tr>
<td>All exportable products**</td>
<td>3.2</td>
<td>49.9</td>
<td>75.0</td>
<td>2.6</td>
<td>54.2</td>
<td>45.2</td>
</tr>
<tr>
<td>(weighted by production shares)</td>
<td>3.1</td>
<td>40.8</td>
<td>74.6</td>
<td>3.0</td>
<td>68.3</td>
<td>46.8</td>
</tr>
<tr>
<td>Poultry NPR</td>
<td>3.4</td>
<td>14.0</td>
<td>34.0</td>
<td>18.7</td>
<td>5.3</td>
<td>35.7</td>
</tr>
<tr>
<td>(weighted by production shares)</td>
<td>-1.7</td>
<td>30.0</td>
<td>67.3</td>
<td>1.6</td>
<td>68.7</td>
<td>40.5</td>
</tr>
</tbody>
</table>

Note: * The indirect nominal rate of protection (NPRI) is identical for all products and therefore only shown once.
** Sugar and poultry are excluded as they are imported.

Source: Own calculations based on WORLD BANK & OECD (2004).

6 Conclusions

Macroeconomic policy has played and will continue to play an important role in agricultural development in Ukraine. Our calculations demonstrate that between 1996 and 2001, indirect policies had effects on agricultural prices that were at least of the same order of magnitude as the effects of direct, agriculture-specific policies. The size and the direction of the impact of all economic policies on agriculture therefore differed considerably from the size and the direction of the impact of agricultural policies alone. Clearly, agricultural development and agricultural policy must be considered in an economy-wide framework and not in isolation. In this respect, special attention should be paid to the RER and its misalignment. The RER reflects all the major and internal and external forces acting on the economy and is a good barometer of the quality of overall economic policies.

In Ukraine, where agriculture occupies an important place in the national economy in terms of GDP contribution, employment, export shares and food expenditures, agricultural policy itself greatly affects non-agricultural sectors and the above-mentioned
macroeconomic variables. If policy makers use distortive policy instruments to protect farmers, macroeconomic stability and economic growth as a whole can suffer as a result, and this can at least partly neutralise the desired impact of protection on agriculture. In summary, agriculture is not only influenced by agrarian policy: it is also influenced by and itself influences economic policy making in general. Agricultural policy makers must consider these links if they want to implement truly effective agricultural policies and do justice to their responsibility for overall economic development as opposed to narrow sectoral interests in Ukraine.

7 References


5 **Agricultural Productivity Growth: a Vehicle for Rural Poverty Reduction in Ukraine?**

VIKTORIYA GALUSHKO & STEPHAN VON CRAMON-TAUBADEL

1 **Introduction**

The link between agricultural growth and rural poverty has long been of great interest to economists, and this interest has generated a voluminous literature on the topic. However, few attempts have been made to quantify the links between agricultural growth and rural poverty in transition countries. In this chapter we analyse the relationship between agricultural productivity growth and rural poverty in Ukraine from 1999 to 2002, which is a period of early recovery in Ukrainian agriculture. Highlighting the linkages between productivity and rural poverty may help policy makers identify effective strategies for fighting poverty.

The chapter is organized as follows. Section 2 presents a discussion of the links between agricultural growth and rural poverty and a description of key trends in Ukraine. In section 3 we develop an empirical framework for exploring the links between agricultural Total Factor Productivity (TFP) growth and rural poverty in Ukraine, and present the results of a corresponding empirical analysis. Section 4 summarizes the findings and discusses policy instruments for alleviating rural poverty.

2 **Agricultural growth and rural poverty in Ukraine: Theory and description**

In the 1950s and 60s it was believed that economic growth would yield benefits to the poor. Furthermore, it was believed and supported by some evidence that what mattered for poverty reduction in agrarian societies was agricultural growth, while “the rapid growth of urban areas in the absence of sustained rural growth tends to reinforce the rural-urban disparities and does not benefit the poor” (RAVALLION & DATT, 1999). The main argument for agricultural growth having poverty alleviation effects was that it would have positive spill-over effects on the poor through increased employment opportunities in both the farm and off-farm, agriculture-related sectors.

Empirical evidence accumulated by the early 1970s, however, suggested that the relationship between agricultural growth and rural poverty was ambiguous. The impact of agricultural growth on the rural poor depends on initial conditions as well as the structure of incentives and the level of institutional development. Agricultural productivity growth can yield benefits to the poor in the form of lower prices for staple food and increased availability of food. It also affects factor markets, and, in particular the labour market: theoretically higher marginal productivity of labour results in higher wage rates and increased employment.

However, there is also reason to believe that agricultural aggregate productivity growth can have adverse effects on rural poor, particularly in the short-run. Because of the peculiarities of transition economies – such as large-scale and rapid labour-shedding in agriculture – the transformation from state to private ownership accompanied by aggregate
productivity growth can result in lay-offs of surplus labour rather than increased employment as predicted by theory, thus leading to loss of wage earnings for the rural poor (especially unskilled workers who are most likely to be laid off). Even though it is believed that agricultural growth stimulates the development of rural small-scale businesses such as processing and trade, which then create off-farm employment opportunities that can absorb shed labour, because of the underdevelopment of institutions in transition economies it may take years before the new industries related to agriculture are established and absorb unskilled rural labour. Furthermore, in countries such as Ukraine most rural households are handicapped by inadequate endowments of the physical and human assets that are required to adapt and take advantage of new opportunities, for example by establishing small enterprises.

Figures 5.1 and 5.2 present evidence on some of these processes in Ukraine. The rapid decline in agricultural output up to 1999 adversely affected food availability and affordability, which induced a large portion of rural households to produce their own food supply. Throughout transition the agricultural land area owned by rural households has been steadily increasing, as has household production (figure 5.1). While this indicates that food production provides a ‘fall back’ option for rural households, income from farming and subsistence production are often inadequate to keep households from falling into poverty.

**Figure 5.1: Trends in agricultural production and agricultural land ownership by private households in Ukraine (1990-2002)**

Spurred by important reforms in 1999 and 2000 as well as the beneficial impact of devaluation following the financial crisis in late 1998 and 1999 (see chapter 4 on the links between macroeconomic developments and agriculture), Ukrainian agricultural production began to grow again in 2000. This growth contributed to an increase in real agricultural wages of 52% between 2000 and 2002 (figure 5.2). At the same time, however, it seems to
have reduced employment in agriculture, with the rate of lay-offs of farm workers accelerating from 6 and 5% in 1999 and 2000, to 14 and 17% in 2001 and 2002, respectively. This suggests that as productivity increased, farms were both laying off increasing numbers of workers and paying the remaining workers considerably higher wages. Furthermore, total employment in rural areas (both on- and off-farm) slightly increased from 93.2% in 2000 to 93.4% in 2002, which indicates that agricultural growth may have been associated with increased off-farm employment.

The net impact of these developments on poverty is not clear a priori. Due to a lack of data we cannot trace the development of poverty during the early stages of transition when agricultural output was declining. However, we do know that rural poverty (headcount ratio) declined from 50.8% in 2000 to 39% in 2002. This suggests that the net impact of growth and productivity increases has been to reduce poverty. Significant regional differences in rural poverty rates remain, however, so aggregated national data might not provide an accurate picture.

**Figure 5.2: Farm employment and real agricultural wages in Ukraine (1995-2002)**

![Graph showing farm employment and real agricultural wages in Ukraine (1995-2002)](source: STATE STATISTICS COMMITTEE OF UKRAINE (2003)).

In summary, it is not clear how agricultural growth has affected poverty in Ukraine. In the long run it appears clear that agricultural growth will reduce poverty, when all factors of production are mobile, factor markets work efficiently and individuals can be retrained to suit emerging job opportunities. But agriculture in Ukraine has only been growing for a short time following a significant decline in the first years of transition, and agriculture and the economy as a whole in Ukraine continue to be plagued by a variety of rigidities and distortions. In the following sections we therefore carry out an econometric analysis of the available data to see whether this leads to clear conclusions.
3 Agricultural growth and rural poverty in Ukraine: An econometric analysis

3.1 A model for the econometric analysis

In the following we derive a set of reduced-form equations that relate TFP growth, poverty and inequality and a series of other variables in Ukraine. We begin by postulating that the main determinants of rural poverty are:

- Income inequality measured by the Gini coefficient ($Gini$).
- Employment of skilled workers measured as the share of workers with tertiary education in the economically active population ($Skilled$).
- Employment of unskilled workers measured as the share of workers with secondary education in the economically active population ($Unskilled$).
- Terms-of-trade measured as the ratio of grain prices to the non-food GDP deflator ($TT$).
- Real agricultural wages paid by agricultural enterprises ($Rwage$).
- Government spending on agriculture ($Agrospen$); and,
- The agricultural bias of economic growth ($Growth$).

The relationship between income inequality and poverty can be complex, but it is plausible to expect that greater inequality will be associated with increased levels of poverty. While increased employment of well-paid skilled labour will, ceteris paribus, reduce poverty, increased employment of unskilled could lead to increased numbers of working poor, depending on wage levels and regulations (i.e. minimum wage legislation). Increases in real wages paid by agricultural enterprises are expected to reduce rural poverty, while higher terms of trade are expected to increase it. Government spending on agriculture includes market intervention and support for enterprises, as well as spending on the social sphere (e.g. village schools, local infrastructure), all of which might be expected to reduce rural poverty. The variable $Growth$, measured as the ratio of value added in agriculture to value added in the non-farm sectors, is included to measure the impact of ‘agriculture biased’ growth. As mentioned at the beginning of section 2, some authors suggest that agriculture biased growth reduces rural poverty. The resulting poverty equation is therefore:

$$
\log(Poverty) = \alpha_0 + \alpha_1 \log(Gini) + \alpha_2 \log(Skilled) + \alpha_3 \log(Unskilled) + \alpha_4 \log(TT) + \\
+ \alpha_5 \log(Rwage) + \alpha_6 \log(Agrospen) + \alpha_7 \log(Growth) + \varepsilon,
$$

In the next step we introduce TFP in agriculture as a variable that influences some of the variables on the right hand side of equation (5.1) and, thus, ultimately influences poverty.
3.2 TFP growth and income inequality

Equation (5.2) specifies the link between TFP growth and income inequality as follows:

\[
\log(\text{Gini})_t = \delta_0 + \delta_1 \log(\text{TFP})_t + \delta_2 \log(\text{VA})_{t-1} + \delta_3 \log(\text{Econactive})_t + \delta_4 \log(\text{RMWage})_t + \delta_5 \log(\text{Agrospen})_t + \xi_t. \tag{5.2}
\]

The link between agricultural productivity growth and income inequality is controversial. DE JANVRY & SADOULET (1995) show that “inequality can indeed increase with growth, and for growth to reduce inequality requires very high growth”. Due to the specifics of agricultural transition discussed in section 2 above, we suspect that TFP growth may initially increase inequality. However, the impact of TFP on inequality depends on the extent to which the rural poor participate and share in growth, and this is conditioned by the other variables on the right hand side of equation (5.2). Rapid development of the non-farm sector (real value added in the non-farm sector lagged by one year – VA_{t-1}) can help absorb rural unemployed, thus leading to increased earnings by the poorest and reducing inequality. The share of the population that is economically active (Econactive) measures the proportion of population that is likely to share in the benefits of economic growth: the higher this share the lower the inequality. The real minimum wage (RMWage) is expected to reduce disparities between unskilled workers, who are usually paid minimum wages, and skilled workers. Thus, the minimum wage shifts those at the lower end of income distribution up, and reduces income inequality. Finally, the impact of government agricultural spending on income inequality depends on the nature of this spending. If it is devoted to the development of infrastructure, research, extension services and social programs for the poor, then it is likely to reduce income inequalities. However, if government programs primarily support profitable farms, then government spending will increase inequalities. There are indications that some government spending in Ukraine functions in this manner. For example, the government subsidises interest payments on commercial credits to agricultural producers provided the interest rate does not exceed 18% per annum. Banks only provide loans at such ‘low’ rates to larger, profitable farms, farms that are less likely to retain unproductive labour and more likely to introduce capital-intensive (labour-replacing) technologies. The result can be increased inequality in the short run.

3.3 TFP growth and employment

TFP growth is postulated to influence employment of skilled and unskilled labour as follows:

\[
\log(\text{Skilled})_t = \gamma_0 + \gamma_1 \log(\text{TFP})_t + \gamma_2 \log(\text{TFP})_{t-1} + \gamma_3 \log(\text{TFP})_{t-2} + \gamma_4 \log(\text{RMWage})_t + \\
\gamma_5 \log(\text{Capitalha})_t + \vartheta_t; \text{ and,} \\
\log(\text{Unskilled})_t = \varphi_0 + \varphi_1 \log(\text{TFP})_t + \varphi_2 \log(\text{TFP})_{t-1} + \varphi_3 \log(\text{TFP})_{t-2} + \varphi_4 \log(\text{RMWage})_t + \\
\varphi_5 \log(\text{Capitalha})_t + \vartheta_t. \tag{5.3, 5.4}
\]

If TFP rises due to the introduction of new technologies such as high-yielding varieties, the demand for skilled labour can be expected to rise. However, to the extent that TFP growth involves investments in capital-intensive, labour replacing technologies, the resulting decline in rural employment could reduce employment of unskilled labour. In the
longer run, TPF growth will be associated with output expansion and lower prices for food and raw materials. This can stimulate other sectors of the economy, creating employment opportunities for both skilled and unskilled labour. To capture these effects, lagged TFP growth is included in equations (5.3) and (5.4). Otherwise, both equations postulate that employment is also determined by the real minimum wage ($RMWage$) and the availability of capital per hectare ($Capital_{ha}$). As the minimum wage rises, unskilled labour becomes relatively costly, which leads to a substitution of capital (either physical or human) for unskilled labour. Thus, we expect that a rise in the minimum wage increases employment of skilled workers and reduces employment of unskilled workers. Increased availability of capital per ha is likely to decrease the employment of both skilled and unskilled workers.

### 3.4 TFP growth and the real agricultural wage

The relationship between TPF and real agricultural wages is specified as follows:

$$\log(R_{wage})_t = \beta_0 + \beta_1 \log(TFP)_{t-1} + \beta_2 \log(LabourS)_t + \beta_3 \log(VA)_{t-1} + \beta_4 \log(RMWage)_t + \beta_5 \log(dummy\_West) + \eta_t.$$  

(5.5)

TFP growth in one year is expected to lead to higher agricultural wages in the next. The lag is introduced to account for delays associated with agricultural production processes and the renegotiation of wages and other conditions of employment. Agricultural wages are also influenced by the minimum wage, the development of the non-farm sector (value added in the non-farm sector) and the supply of labour. As was mentioned above a rise in the minimum wage ($RMWage$) is expected to reduce the employment of unskilled workers (who receive low wages) and increase the employment of skilled workers. As a result, the average agricultural wage will increase. Rapid urban sector growth ($VA$) stimulates migration from rural areas, which puts upward pressure on agricultural wages. Increases supply of labour ($LabourS$) will reduce wages, ceteris paribus, and dummy\_West – is a dummy variable for the Western oblasts of Ukraine that is incorporated to account for the fact that many workers in Western Ukraine migrate or work seasonally in neighbouring countries such as Poland.

### 3.5 TFP growth and terms of trade

The final equation (5.6) to be specified links TFP growth and agricultural terms of trade:

$$\log(TT)_t = \mu_0 + \mu_1 \log(TFP)_t + \mu_2 \log(REER)_t + \mu_3 \log(Wprice)_t + \mu_4 \log(Income)_t + \mu_5 \log(PGrowth)_t + \nu_t.$$  

Under conditions of free international trade, domestic productivity improvements will have no influence on agricultural commodity prices. However, in Ukraine grain prices fall below the export parity price in the post-harvest period for two reasons: (i) surplus grain cannot be moved out of the country immediately and there is an excess supply of grain on the market, and (ii) most farmers do not have storage facilities and are thus obliged to sell their crops straight away after harvesting. Hence, as a result of TFP growth the domestic price for grains will fall at least seasonally, thus affecting annual average prices as well. Besides TFP growth, domestic prices for agricultural commodities and grains in particular will be positively correlated with the corresponding world market price ($Wprice$). Incomes will have little impact on the numerator of $TT$ (grain prices), since these, as just argued, are mainly determined by world market prices. However, rising incomes will have an impact on the prices of non-tradable goods (e.g. housing) and services (e.g. transportation), thus
increasing the denominator of $TT$. Hence, the impact of $Income$ on $TT$ is expected to be negative. Since grain is a tradable commodity, its domestic price depends on the real exchange rate: following a depreciation of the real exchange rate ($REER$) domestically-produced tradable goods become less expensive for foreign countries, leading to increased export demand and prices.

### 3.6 Data description and method

Equations (5.1) through (5.6) are estimated using regional data for 25 Ukrainian Oblasts over 4 years (1999-2002), for a panel of 100 observations. To estimate the headcount ratio as a measure of rural poverty and income inequality, household surveys provided by State Statistics Committee of Ukraine are used. The poverty threshold defined by the World Bank, 1 US$ a day per capita, is used. 1 US$ in 1999 was transformed into the local currency using the official exchange rate in 1999. For 2000-2002 this poverty threshold is inflated using the consumer price index. Data on the share of workers with basic, secondary, incomplete and complete higher education are provided by State Statistics Committee, which is also the source of data on: wages paid by agricultural enterprises; the GDP deflator (CPI); value added in the farm and non-farm sectors; and the economically active population in rural areas. Government spending on agriculture is taken from the reports of the Ministry of Finance on local budgets. FAO statistics provide world market grain prices.

TFP in Ukrainian agriculture is calculated using the Malmquist productivity index. The method of calculating TFP is beyond the scope of this paper; for a detailed description and a review of the obtained results see chapter 8 in this book.

Clearly, the causality linking some of the variables of interest is indeterminate. For example, while productivity affects poverty, poverty can constrain productivity growth because the poor do not have access to education, public facilities and credits, which deteriorates their human capital and limits future TFP growth. However, the available data do not allow us to extend the analysis to include the causal link between initial inequality and poverty and TFP growth. Thus, we assume that over the relatively brief period considered, TFP is predetermined and causality runs exclusively from TPF to poverty via the variables included on the right hand side of the poverty equation (5.1).

### 3.7 Results

The results of the econometric analysis are summarised in table 5.1. Since our primary interest lies in analysing the effect of TFP growth on rural poverty, only this effect

---

1. In 1999, State Statistics Committee of Ukraine’s methodology of collecting information on households’ living standards was changed. Hence, measures of inequality generated before and after 1999 cannot be compared.

2. This was confirmed using endogeneity tests in which the dependent variables in equations (5.2) through (5.6) are regressed on all exogenous variables, i.e. variables that do not appear on the left-hand side of these equations, and the resulting residuals are added to equation (5.1). The p-values of the corresponding zero coefficient tests are: 0.65, 0.93, 0.72, 0.89 and 0.36 for equations (5.2) through (5.6), respectively, indicating that the null hypothesis of exogeneity cannot be rejected in any case.
is discussed in the following. Note however, that most of the other variables included in the equations are significant and have plausible signs.

Table 5.1: Indirect effects of TFP growth on poverty

<table>
<thead>
<tr>
<th>Poverty (equation 5.1)</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>Inequality (equation 5.2)</th>
<th>Coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini,</td>
<td>0.41*</td>
<td>0.121</td>
<td>TFP,</td>
<td>0.19*</td>
<td>0.062</td>
</tr>
<tr>
<td>Skilled,</td>
<td>-0.92*</td>
<td>0.294</td>
<td>VA,</td>
<td>-0.01**</td>
<td>0.095</td>
</tr>
<tr>
<td>Unskilled,</td>
<td>-0.68**</td>
<td>0.302</td>
<td>Econactive,</td>
<td>-0.27**</td>
<td>0.028</td>
</tr>
<tr>
<td>TT,</td>
<td>0.35*</td>
<td>0.067</td>
<td>RMWage,</td>
<td>-0.22**</td>
<td>0.128</td>
</tr>
<tr>
<td>Rwage,</td>
<td>-0.15***</td>
<td>0.081</td>
<td>Agrospen,</td>
<td>0.005**</td>
<td>0.002</td>
</tr>
<tr>
<td>Agrospen,</td>
<td>-0.003</td>
<td>0.003</td>
<td>Constant</td>
<td>0.55</td>
<td>0.630</td>
</tr>
<tr>
<td>Growth,</td>
<td>-0.05</td>
<td>0.037</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>9.12</td>
<td>2.259</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R² within = 0.48  R² between = 0.20  R² overall = 0.34

Skilled employment (equation 5.3)

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFP,</td>
<td>0.23*</td>
</tr>
<tr>
<td>TFP,1</td>
<td>-0.11</td>
</tr>
<tr>
<td>TFP,2</td>
<td>-0.14</td>
</tr>
<tr>
<td>RMWage,</td>
<td>0.21***</td>
</tr>
<tr>
<td>Capital,</td>
<td>-0.13***</td>
</tr>
<tr>
<td>Constant</td>
<td>2.98</td>
</tr>
</tbody>
</table>

R² within = 0.30  R² between = 0.06  R² overall = 0.14

Unskilled employment (equation 5.4)

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFP,</td>
<td>-0.25*</td>
</tr>
<tr>
<td>TFP,1</td>
<td>0.04</td>
</tr>
<tr>
<td>TFP,2</td>
<td>0.10</td>
</tr>
<tr>
<td>RMWage,</td>
<td>-0.13</td>
</tr>
<tr>
<td>Constant</td>
<td>4.58</td>
</tr>
</tbody>
</table>

R² within = 0.35  R² between = 0.15  R² overall = 0.24

Real rural wage (equation 5.5)

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFP,1</td>
<td>0.28*</td>
</tr>
<tr>
<td>Labour,</td>
<td>-0.46*</td>
</tr>
<tr>
<td>VA,</td>
<td>0.23*</td>
</tr>
<tr>
<td>RMWage,</td>
<td>0.41*</td>
</tr>
<tr>
<td>Dummy_West</td>
<td>-0.22*</td>
</tr>
<tr>
<td>Constant</td>
<td>2.55</td>
</tr>
</tbody>
</table>

R² within = 0.76  R² between = 0.72  R² overall = 0.73

Terms-of-trade (equation 5.6)

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFP,</td>
<td>-0.16*</td>
</tr>
<tr>
<td>REER,</td>
<td>1.88*</td>
</tr>
<tr>
<td>Wprice,</td>
<td>3.77*</td>
</tr>
<tr>
<td>Income,</td>
<td>-0.34*</td>
</tr>
<tr>
<td>PGrowth,</td>
<td>5.19*</td>
</tr>
<tr>
<td>Constant</td>
<td>-17.64</td>
</tr>
</tbody>
</table>

R² within = 0.98  R² between = 0.68  R² overall = 0.93

Notes:  * - significant at 1%, ** - at 5% and *** - at 10%.

Source: Authors’ calculations.

In equation (5.1), the effect of income inequality and grain prices on poverty is found to be significant and positive. Increases in agricultural wages and in both skilled and unskilled employment appear to reduce rural poverty, as does agriculture-biased economic growth. As expected, TFP growth increases inequality (equation 5.2): a 1% increase in TFP raises the Gini coefficient by 0.19%. Increases in TFP increase rural skilled employment (equation 5.3), but reduce in rural unskilled employment (equation 5.4). The effects of lagged TFP growth are not significant in these equations. As expected, TFP has a lagged, positive impact on wages: 1% growth in TFP results in a lagged increase in the real agricultural wage of 0.28% (equation 5.5). Finally, the effect of TFP growth on agricultural
terms of trade is significant and negative as expected (equation 5.6): a 1% increase in TFP results in a reduction of relative grain prices by 0.16%.

The aggregate impact of TFP change in the current period on the incidence of rural poverty can be calculated as follows:

$$\frac{d\text{Poverty}}{d\text{TFP}_t} = \frac{\partial \text{Poverty}}{\partial \text{Gini}} \cdot \frac{\partial \text{Gini}}{\partial \text{TFP}_t} + \frac{\partial \text{Poverty}}{\partial \text{Skilled}} \cdot \frac{\partial \text{Skilled}}{\partial \text{TFP}_t} + \frac{\partial \text{Poverty}}{\partial \text{Unskilled}} \cdot \frac{\partial \text{Unskilled}}{\partial \text{TFP}_t} + \frac{\partial \text{Poverty}}{\partial \text{Gini}} \cdot \frac{\partial \text{Gini}}{\partial \text{TFP}_t} + \frac{\partial \text{Gini}}{\partial \text{TFP}_t} \cdot \frac{\partial \text{Gini}}{\partial \text{TFP}_t}.$$  

The partial derivatives are the coefficients of the model taken from equations (5.1) through (5.4) and (5.6). Multiplying the corresponding coefficients and adding up indicates that a 1% growth in TFP reduces the incidence of rural poverty by 0.02%. Since the rural headcount index accounted for 39% or about 5.8 mill. rural inhabitants in 2002, 1% TFP growth would have reduced this number by 1160 persons. This is evidence that due to the complex trade-offs discussed above, TFP growth in agriculture yields only marginal net benefits to the rural poor.

The aggregate impact of lagged TFP growth on rural poverty can be found using equations (5.1) and (5.5) as:

$$\frac{d\text{Poverty}}{d\text{TFP}_{t-1}} = \frac{\partial \text{Poverty}}{\partial \text{R Wage}} \cdot \frac{\partial \text{R Wage}}{\partial \text{TFP}_{t-1}}.$$  

Substituting the corresponding coefficients indicates that 1% TFP growth triggers a lagged 0.04% reduction in the incidence of rural poverty. Combining the contemporaneous and lagged effect of TFP growth indicates that within two years 1% growth in TFP can produce a net reduction in the number of the rural poor by 0.06% or 3480 people.

Summarising, the findings show that in the early recovery stage, TFP growth has a net poverty reducing impact that is, however, small due to the complex trade-offs discussed above.

4 Conclusions and policy options

In this paper we explore the theoretical and empirical relationships between agricultural TFP growth and rural poverty in Ukraine. The results reveal that TFP growth has positive spill-over effects in the form of increased real earnings from agricultural activities and increased employment of skilled workers. At the same time, TFP growth increases disparities between rich and poor and reduces the employment of unskilled labour. Due to these trade-offs, the poverty reduction resulting from agricultural TFP growth in Ukraine is quite low: within two years a 1% increase in agricultural TFP decreases the incidence of rural poverty by only 0.06%.

These findings provide a justification for policies that reinforce the poverty alleviation impacts of TFP growth in Ukrainian agriculture. First, progressive taxation and a functioning social security net can help to ensure that those who are squeezed out of work in the course of the restructuring that accompanies productivity growth are not forced into poverty. Policies that encourage factor, especially labour, mobility and the accumulation of human capital (education, research and extension) can also play an important role. Second, since a large proportion of the rural poor is increasingly dependent on off-farm employment
for wages, the government should launch rural public works programs that would absorb unskilled labour laid-off as a result of agricultural TFP growth.

5 References


Agricultural Policy versus Rural Policy: Core Tasks and Joint Responsibilities

ARNIM KUHN & SERHIY DEMYANENKO

1 Old and new policy concepts for rural areas

The farm sector is expected to contribute to overall welfare in Ukraine by delivering high-quality food at low prices and by generating employment and export earnings. However, agriculture is also responsible for what happens on the lion’s share of Ukraine’s land. Furthermore, one third of the Ukrainian population lives in rural areas, and most of this rural population still depends to a large extent on agriculture. Since independence, agricultural policy in the narrow sense of production and prices in Ukraine has had a mixed record; undeniable successes have been overshadowed by generally slow progress towards a vital, market-oriented sector. The picture does not improve when policies for rural areas in general are considered. Today, there is no coherent development concept for rural areas in Ukraine, and policy responsibilities are not clearly defined. This chapter develops policy goals and concepts for both rural areas and the agricultural sector.

1.1 Current agricultural policy approaches

The major problem of the agricultural sector in Ukraine today is its low level of productivity. Despite Ukraine’s often-cited production potential, despite rising trends in world market prices for the major export crops and products, triggered by increasing world demand, and despite swift economic growth in the rest of the economy; large parts of Ukrainian agriculture continue to stumble rather than stride into the future. According to agronomic experts, current crop yield levels could almost be doubled in the near future, if the so-called ‘productivity gap’ could be closed.

Agricultural policy and the activities of the Ministry of Agricultural Policy (MAP) have focused on improving the conditions for the agricultural sector. Unfortunately, most of these policies have largely failed to tackle the productivity gap. The reason for this is that the implicit goals of this policy have not been targeted at productivity increases, but rather at sustaining existing structures and procedures by granting aid and tax breaks to producers, and attempting to control prices and quantities on output (e.g. grains, sunflower seed and sugar) and input (e.g. machinery and credit) markets. Import protection for farm machinery, for example, may provide support to the domestic farm machinery industry. But it also forces farmers to pay more for the machines that they need (or to work with lower quality machines than they otherwise could). In this way, the productivity gap is sustained.

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1 See chapter 11 Farm Management Challenges in Ukrainian Agriculture for a further discussion on the subject.

2 See the budget figures later in this chapter and the discussion in chapter 2 Shifting Agricultural Policy towards Measures Envisaged by the Green Box. Almost 40% of Ukraine’s agricultural budget is spent on the financial support of production or farms.
Policy has also been inconsistent in its attempt to support the farm sector. While farmers receive tax breaks and some subsidies on the one hand, they are indirectly taxed by export taxes and bureaucratic ‘monitoring and control’ of markets on the other. Policy makers are ‘stepping on the gas and the brakes’ at the same time, thus damaging the car while not getting very far.

1.2 Core competences versus shared responsibilities

What is agricultural policy about? Many actors in agricultural policy believe that the agricultural sector is basically identical with the rural economy. However, this view is antiquated. ‘Rural’ is a geographic concept, and agriculture is only one of many economic sectors and activities that take place in rural areas. Thus, agricultural policy should not strive to assume responsibility for the whole range of rural development issues such as the social situation in rural areas, rural infrastructure, medicine, schools etc. This is primarily the task of other Ministries (Economy, Infrastructure, Education, Social Policy). The MAP should focus on its core competences, because this will make successful work much more likely. Clearly, experts from the MAP must collaborate in inter-ministerial rural policy working groups. Policies aimed at rural areas are a shared responsibility in which agriculture plays an important but by no means exclusive role. Rural development should be regarded as a cross-sectional task to be coordinated between several Ministries.

In the next Section we make suggestions on what should be considered the core competence of an agricultural policy that is aimed at increased productivity of the sector. Then we deal with rural development policy as a prominent example of a joint responsibility of agricultural policy to be shared with other policy areas.

2 Core competences: New goals for agricultural policy

2.1 Developing coherent policy goals

Agricultural policy makers in Ukraine should adopt a realistic set of agricultural policy goals against which individual policy measures can be evaluated. In a market economy, agricultural policy should enable agriculture to:

- Create real value added through high productivity.
- Supply high-quality products; and,
- Contribute to preserving nature and landscape.

The main intentions behind these policy goals are as follows:

2.1.1 Create real value added through high productivity

The purpose of any economic activity is to produce goods the value of which is higher than the value of the resources required for their production. Higher production efficiency increases the value added from production, while direct or indirect subsidies from budget funds or through the taxation of competing imports decrease value added, as they increase resource costs for the total economy. Policy should focus on fostering technical progress and avoid prolonged heavy subsidisation, trade protection, and other distortions of market outcomes. Following this principle is the basic way to ensure that agriculture delivers a real contribution to overall economic growth.
2.1.2 Supply high-quality products

Food (domestic or imported) has to be available in sufficient quantities in order to cover the nutritional needs of the population, but it is also important that it is healthy and safe. Moreover, if Ukraine is to benefit from the export of agricultural raw materials and processed food products, product quality is an important factor in determining competitiveness on domestic and international markets.

2.1.3 Contribute to preserving nature and landscape

Agricultural production has widespread ecological consequences. The use of fertilisers and chemicals affects groundwater quality and biodiversity. Moreover, the structure of fields and the patterns of agricultural production shape the rural landscape, which defines the feeling of ‘being at home’ for citizens, as well as the attractiveness of the countryside for tourism. An increasingly important aspect is animal welfare, i.e. that animals are held under decent conditions and do not suffer unnecessarily.

All these goals are compatible with a market economy, and they do not force agricultural policy makers to support agricultural producers in a way which finally leads to excess surpluses and consequent conflicts with international trade partners. But there are conflicts between these goals which have to be overcome through compromises. Efficient production and competitiveness can conflict with ecological considerations. A compromise could consist in setting minimum ecological standards and supporting the competitiveness of organic farming in Ukraine.

Among these goals, priorities should be defined. The core priority should be to increase productivity subject to constraints such as the maintenance of minimum food reserves, quality standards and environmental standards.

2.2 Measures to achieve these agricultural policy goals

2.2.1 Create maximum real value added through high productivity

The reforms in the agricultural sector should be continued by allowing land sales and bankruptcy procedures. It is very important to raise the educational standards in the agricultural labour force by introducing advisory services, updating curricula and broadening education contents for agricultural professionals, as the productivity gap is predominantly caused by a lack of skills. Moreover, plant and animal pest control and prevention systems should be improved. The influence of state bodies on commodity markets has to be strictly limited to give producers the freedom to make market-oriented decisions. Direct and indirect subsidies should be abolished, and the freed funds used for long-term investments in public services in the area of agriculture (see above). Finally, joining the WTO as soon as possible in order to ensure fair treatment by international trade partners in the future should remain a first priority.

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3 See chapter 14 The 2003 Wheat Crisis and Food Security for a discussion of food security and reserve stocks.

4 See chapter 1 The Implications of WTO-Accession for Agricultural Policy in Ukraine.
2.2.2 Supply high-quality products

Competition on the food market should be enhanced by breaking up remaining regional monopolies. Only competition makes producers supply high quality products at reasonable prices. In addition, quality standards for agricultural products that are consistent with international standards are required. On the other hand, existing inspection services should be adapted to new, international standards, and instances of corruption and bribery involving the inspection services should be aggressively prosecuted. The initiation of regional food quality labels might help farmers to market their products both domestically and abroad.

2.2.3 Contribute to preserving nature and landscape

Environmental standards for the use of fertilisers and pesticides, feed quality, and animal welfare need to be introduced. This will make it easier to market Ukrainian produce as ‘ecologically clean’, and may enable farmer to charge a mark-up for inherent ‘process quality’. Cooperating with the Ministry for Environment and the state bodies responsible for tourism is mandatory in the area of land management, for instance to turn marginal lands into nature reserves or allocate them to extensive production is another area.

The (non-exhaustive) suggestions contain some ‘do not’ elements aimed at reducing interventionism. Hence, this is partially – but not exclusively – an agenda for state inactivity. Uncoordinated and ad hoc activity by various state organisations as well as regional and local authorities is extremely damaging to agriculture and must be reined in. The ‘do’ elements, however, require a lot of activity from the Ministry of Agricultural Policy, many of them in areas that have received little attention so far, at least when measured in terms of budget priorities in recent years.

2.3 Consequences for the agricultural budget

What consequences would the priorities outlined above have on the state budget? On the revenue side, indirect tax exemptions should be phased out within several years. On the other hand, taxation of agriculture through export taxes and export VAT refund arrears should be abandoned. On the expenditure side, individual items of agriculture policy spending should be evaluated against their potential to increase the productivity of Ukrainian farms.

Table 6.1 presents an overview of the agricultural budget in Ukraine for the years 2003 and 2004. At slightly more than 3.5 bUAH in 2004, the agricultural budget made up 5% of the state budget of Ukraine. In order evaluate whether the budget is likely to contribute to the suggested policy priorities, we distinguish between productivity-decreasing expenditures, productivity-enhancing expenditures, and neutral expenditures. Among the productivity-decreasing expenditures we consider financial support, direct payments and administrative expenditures. These types of spending maintain inefficient structures and therefore tend to reduce the productivity of Ukrainian agriculture in the long run. Administrative expenditure, while not directly affecting productivity, will tend to increase the power of the bureaucracy and the potential for intervention that distorts markets and reduces productivity. Together, productivity-reducing measures account for almost 50% of the agricultural budget.
### Table 6.1: Assessment of the agricultural budget in 2003 and 2004

<table>
<thead>
<tr>
<th></th>
<th>Share in 2003 (%)</th>
<th>Share in 2004 (%)</th>
<th>Change 2003/04 (%)</th>
<th>Change 2003/04 (percentage points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial support</td>
<td>38.9</td>
<td>36.1</td>
<td>-7.2</td>
<td>-2.8</td>
</tr>
<tr>
<td>Direct payments</td>
<td>4.9</td>
<td>4.1</td>
<td>-18.0</td>
<td>-0.8</td>
</tr>
<tr>
<td>Administrative expenditures</td>
<td>4.8</td>
<td>8.9</td>
<td>+85.8</td>
<td>+4.1</td>
</tr>
<tr>
<td>R&amp;D, education, training</td>
<td>23.0</td>
<td>30.4</td>
<td>+32.6</td>
<td>+7.4</td>
</tr>
<tr>
<td>Land reform</td>
<td>7.5</td>
<td>2.2</td>
<td>-70.9</td>
<td>-5.3</td>
</tr>
<tr>
<td>Pest and crop disease control</td>
<td>2.0</td>
<td>2.1</td>
<td>+3.3</td>
<td>+0.1</td>
</tr>
<tr>
<td>Inspection services</td>
<td>15.6</td>
<td>11.5</td>
<td>-26.2</td>
<td>-4.1</td>
</tr>
<tr>
<td>Rural development</td>
<td>0.7</td>
<td>0.7</td>
<td>+3.4</td>
<td>+0.0</td>
</tr>
<tr>
<td>Reserve stock accumulation</td>
<td>1.0</td>
<td>2.0</td>
<td>+105.1</td>
<td>+1.0</td>
</tr>
<tr>
<td>Environmental protection</td>
<td>1.7</td>
<td>2.0</td>
<td>+23.3</td>
<td>+0.3</td>
</tr>
<tr>
<td>Expenditures with a negative productivity impact (1-3)</td>
<td>48.6</td>
<td>49.1</td>
<td>0.9</td>
<td>0.5</td>
</tr>
<tr>
<td>Expenditures with a positive productivity impact (4-6)</td>
<td>32.5</td>
<td>34.7</td>
<td>6.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Expenditures with a neutral productivity impact (7-10)</td>
<td>18.9</td>
<td>16.2</td>
<td>-14.2</td>
<td>-2.7</td>
</tr>
</tbody>
</table>

Source: Laws of Ukraine “On Budget of Ukraine” (diff. years).

There are also measures which are useful or necessary, but have a neutral impact on productivity growth. Among these are inspection services, which are supposed to guarantee product quality, but which can also be misused to extort bribes from producers and processors. The share of these measures in the budget is decreasing, mainly because inspection services have been slimmed down.

Measures that are likely to increase the economic productivity of agricultural production are research, education and training, land reform, and disease control. These measures account for slightly more than one-third of the budget, and the significantly increased expenditures on research and training in the 2004 budget are definitely a positive signal. The share of spending on land reform, on the other hand, is reduced, which may have to do with the prospect of having these activities financed by a World Bank loan during the next years.

The high share of unspecific financial support to producers under the productivity-decreasing measures (almost 50%) indicates that there is still considerable financial leeway for agricultural policy to change course and adopt long run, productivity-enhancing priorities.

## 3 Rural policy as a joint responsibility

Rural policy is going to be one of the dominant issues in Ukrainian economics over the next years, touching on regional development, social security systems, infrastructure maintenance and development, sustaining economic growth, and many other issues. Rural policy is basically about two issues: a) delivering public services in rural areas, particularly physical and social infrastructure, and b) supporting economic development in rural areas. In addition to its core tasks in agricultural policy, the MAP can and should also contribute to this joint task together with other ministries. In this section we define the role of rural areas, point out the challenges and dilemmas that rural policy faces under the special circumstances in Ukraine, and make recommendations for policy.
3.1 The economic role of rural areas

It is a common mistake to equate agricultural and rural development. This mistake results in rural policies that are biased towards agriculture, neglecting other economic activities, and thereby contributing to the ongoing depopulation and economic degradation of the countryside. In order to arrive at a reasonable policy agenda, there has to be a clear idea about the role of rural areas for the well-being of Ukrainians, both villagers and city-dwellers. What benefits do rural areas deliver to Ukrainian citizens?

- Rural areas deliver food through a functioning agricultural sector and thus contribute to material needs of all citizens. At the low income levels prevailing in Ukraine, food prices play an important role in consumer budgets.

- Rural areas are the economic basis for many professions including farming but also forestry, inland fisheries and tourism. However, rural areas can be much more. Any larger village or small city should offer various public and private goods and services for the people who live there. In most rural areas in Germany, for example, agriculture and forestry play only a marginal role for the creation of value added and employment.

- Rural areas provide living space for the rural population. As such, they need to be endowed with basic infrastructure. An increasing number of city dwellers in Ukraine will probably move to rural areas around the cities and commute to work in the next decade. These new rural inhabitants will be looking for places to build their houses, and will demand local schools, health care and other public services. Other, more remote rural areas will probably be faced with out-migration and an ageing population. Rural areas are already diverse and will probably become increasingly so in the future, ranging from the rural/urban fringes of agglomerations such as Kiev to remote, agriculture-dominated regions especially in the centre and west of the country. Rural policy will have to be flexible to deal with this diversity.

- Another important role of rural areas is that they offer opportunities for recreation. There are many beautiful areas around cities which already today are used for household plots, cottages and other leisure purposes. More remote areas might offer sports-focused tourism. For that reason it is important to preserve nature and what is generally referred to as the ‘multifunctional’ and ‘cultural’ landscape.

- Another important reason for preservation efforts is that rural areas and forests in particular deliver ecological goods such as clean water and air. Misusing the countryside as a garbage dump; the use of too much fertilizer and pesticides in intensive agricultural production; the building of roads and pipelines in sensitive areas: all have the potential to damage the ecological balance and endanger rare species.

A sustainable balance between all of these functions constitutes the vision for the future of rural areas in Ukraine. Agriculture is an important part of that vision, and must

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contribute to it. But the MAP can and should not claim sole responsibility for determining rural policy in Ukraine. Agricultural priorities are not synonymous with optimal rural development and must be balanced and tempered by other inputs into the policy making process. Rural policy is an ambitious, horizontal task that should be coordinated between several ministries.

3.2 Dilemmas facing rural policy in Ukraine

Taking into account their various functions, developing a coherent policy strategy for rural areas is a complex task. Moreover, rural policy faces several dilemmas. The most important of these is demography: Rural areas need investments to improve living conditions, but negative population growth and the out-migration of rural inhabitants from many small settlements will probably continue. The projections of the UN Population Division for Ukraine suggest that its rural population will decrease by one-third in the next 25 years (Figure 6.1).

Figure 6.1: Past and projected population development in Ukraine

![Figure 6.1: Past and projected population development in Ukraine](image)

Source: UN Population Division.

A related dilemma concerns structural change of the rural economy in the course of technical progress in general and the special demands of the transition from collective to private agriculture. Rural development and diversification in Ukraine will require the massive creation of non-agricultural jobs, especially since farms restructuring will continue to decrease the number of purely agricultural jobs. But in remote rural areas with a general

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6 This implication of agricultural growth is discussed in detail in chapter 5 Agricultural Productivity Growth: a Vehicle for Rural Poverty Reduction in Ukraine? Specifically, the empirical analysis in chapter 5 shows that agricultural productivity growth as a negative impact
trend to out-migration, there are few promising business alternatives to agriculture and related services.

The following conclusions can be drawn:

- Existing rural policy concepts for developing countries should not be copied, as these are rather designed to deal with booming populations under increasing resource pressure. Ukraine’s countryside is not confronted with these problems.
- Instead, rural policy designs should explicitly anticipate the demographic and economic trends and go along with them. It is certainly futile to try to ‘stem the tide’ of rural depopulation by administrative means or by propping up inefficient enterprises. Rural economies can create jobs, provided the right infrastructure and skilled labour is available. This is where policy can play a role, by investing in these forms of capital and making it as easy and un-bureaucratic as possible to start up new enterprises.
- Policy goals for rural areas should be modest and measurable. Otherwise, huge budget funds could be wasted.
- Proper local targeting is a major challenge facing rural policy. Therefore, rural development should be based on the principle of local participation, combined with local responsibility for co-financing. In the case of Ukraine, this requires more fiscal independence for regional and local jurisdictions.
- A project approach should be adopted, oriented at specific goals. Small, locally based projects have proven to work better than complex national programmes.
- Projects, once approved, should run over several years and should not be subject to frequent renegotiation. The need to reapply every year for funds leads to political influence and lengthy bargaining procedures that reduce transparency and efficiency. It also makes it almost impossible to make the sort of long-run investments that are most needed.

4 Fields of action for rural policy

Rural development is a complex issue. Besides agriculture it encompasses questions such as the development of roads, transport systems, communication, gas and water supply, sewer systems, health care, education, culture, household services, agricultural and non-agricultural businesses and employment. Beyond agriculture, the following fields of action seem to be most urgent and promising:

Non-agricultural employment. Many new jobs in rural areas will be created in sectors that service agriculture or process agricultural products. Moreover, there will be increasing demand for services for rural households. However, developing these businesses is a task for the private sector and not for the state. Public support could come in the form of ensuring business-friendly environments by fighting both corruption and the harassment of small or newly established businesses. Moreover, technical, social and cultural on the employment of unskilled labour in Ukraine, but a positive impact on the employment of skilled labour.
infrastructure plays an important role in attracting businesses. In areas with a potential for tourism, effective environmental policies play a crucial role.

**Physical infrastructure.** The supply and maintenance of infrastructure is a core public activity in regional and rural policy. While the road network is fairly well developed in Ukraine, much could be done to extend the telecommunications network in order to improve the business environment, particularly through the use of the internet. The various utility networks (water, electricity, sanitation) are in need of repair and reform.

**Social infrastructure.** One of the most pressing issues is improved health care. Providing such care in thinly populated rural areas is a difficult challenge especially when, as in Ukraine, health care provision even in the urban centres such as Kiev is poor and deteriorating. Health care is needed to help the aging rural population, but also to ensure that rural areas remain attractive places for raising families. Tobacco, drug and alcohol addiction and AIDS are extremely costly afflictions for individuals and enterprises, and increased investment in prevention should be a priority.

**Education and training.** Finally, education in rural areas is a problem that is often underestimated. According to international statistics, almost 100% of Ukraine’s population is literate. However, much physical infrastructure and large parts of the curricula in medium and higher education in Ukraine are outdated. The level of professional and vocational training in particular is below international standards. This hinders the adoption of modern technologies and management techniques in agriculture which, in turn, contributes to persistent low productivity. Ukraine may be able to import capital and technologies from abroad, but an educated and well-trained workforce has to be mainly ‘home grown’. Policy makers in Ukraine have largely neglected investment in education and research. Due to the demographic problems in rural areas, providing sufficient schooling and training opportunities in rural areas will be a challenging task.

Almost all ministries can and should be involved in rural policy issues. The list of participating ministries should contain the Ministry of Economy as the coordinating body, and the Ministries of Transport and Communication, Labour and Social Issues, Health Care, Science and Education, and Agrarian Policy as ‘sectoral’ specialists.
Part II:
Farm Enterprises and Economic Reform in Ukraine
7 Ensuring Competition on the Market for Lease Land in Ukraine

ARNIM KUHN & SERHIY DEMYANENKO

1 Introduction

Until the end of communism land was the property of the state. During the period of transition towards a market economy, private ownership of land has been established step by step. Thus, the real restructuring of the former collective farms (CAEs) which started in the year 2000 is creating a new class of small landowners. These new landowners basically have two options for the use of this productive asset. Of course they can set up their own farms, but most of them opt for leasing out their land plots to other agricultural enterprises, be they small or large farm units. Most of these landowners are pensioners for whom the lease payments constitute an important source of income. These individuals will be interested in keeping the shadow price of land reflected in the lease payments as high as possible.

On the other hand, large farms (former CAEs), or newly established private farms which want to increase their acreage, are now forced pay for a productive asset which was basically available for free in the past. Land users and landowners constitute the main agents on the market for agricultural land in Ukraine. This paper deals with the problem of ensuring competition on the market for lease land given the land use structure and distribution of property in Ukraine.

Without doubt it is true that the existence of landowners makes agricultural production more expensive by imposing additional costs on agricultural producers. Landowners receive a rent from their land, a kind of income they get in exchange for the exclusive right to receive the fruits and benefits of land which is now enjoyed by the tenant. One could argue that the large share of lease land drains monetary resources from Ukrainian farmers and thus constitutes a burden on their competitiveness. On the other hand, any decision to transfer the main part of agricultural land to the property funds of large former CAEs would have finalised the expropriation of millions of small landowners under communism. The restitution of this land to its original owners was no longer possible after so many decades, but there was a broad consensus in society that this land should be returned to the people on a broad basis.

The most important function of a land market in a market economy is to facilitate the ‘movement’ of land from less efficient to more efficient producers. However, the emerging land market in Ukraine is burdened with two major inter-linked factors: high transaction costs and an inequality in bargaining power between tenants and landowners. This has the inevitable consequence that much agricultural land in Ukraine is worked by inefficient farms, simply because these farms are very large and headed by directors who are very influential in their communities. The empirical analysis in this paper indicates a strong positive relation between the number of private family farms, competition on the market for lease land, and lease land prices.
2 Why are transaction costs too high?

Transaction costs are costs which arise when two or more economic agents (individuals, enterprises) want to conclude a business deal. They have to look for and find one another, and then they have to undergo a certain procedure (contracts, notary) to legalise the transaction. Thus, transaction costs originate from uncertainty and the need for information and security. To understand this better, imagine a land rental transaction from the perspective of the landowner and the tenant, respectively.

After the expiration of a lease contract, the landowner has the choice between: a) the continuation of the contract with the same tenant; b) finding another tenant; c) working the land by himself; and d) selling the land to someone else. All these alternatives imply different transaction costs. If we assume that the land plot is located somewhere within a large field (which is probably the case for most land plots in Ukraine), the cheapest option is to simply continue the contract. Alternatives b) and d) require finding a new tenant or a buyer, which may be difficult because the land plot may be very small and therefore not interesting to other farmers unless many landowners with adjoining plots all agree to follow the same course of action (which would also involve high transaction costs). Option c) would not require this. But any withdrawal of land (when located in the middle of a field) from the present tenant would require an exchange of land parcels, either with a landowner from the same field when our landowner intends to work the land himself, or with a landowner from another field or even village. In the latter case, if the reason the landowner wishes to cancel the contract is that the tenant does not pay enough (maybe because he is an inefficient farmer), he will have a tough job to convince someone else to entrust his land to that tenant. Even if one cuts out a small rectangle on the border of a field, it will be less convenient for the farmer to carry out fieldwork with huge machinery, which may lead to conflicts between landowner and the former tenant. The consequence of all these considerations – which have probably gone through the heads of hundreds of thousands of new Ukrainian landowners already – is that land transactions are very costly, and that it is better to wait for a favourable offer or to collude with other landowners instead of seeking opportunities on one’s own. The high level of transaction costs originates from both information deficiencies and the fact that land is immobile and cannot be physically moved to another tenant or owner.

From the perspective of the tenant the situation looks somewhat more favourable, particularly when the tenant is a large former CAE. In many cases tenants deal with former workers of the CAE, mostly a whole village. This makes it much easier to rally all the owners of plots in one or several fields and come to an agreement. This does not say anything about the price a tenant is likely to pay in the end, but only about the costs of concluding the transactions. If a tenant does not want to continue a contract, he simply informs the assembly of landowners, or all owners individually.

A medium-sized private farmer may face more difficulties if he intends to change his land use, e.g. enlarging his acreage. He has to find a proper field where tenure contracts are about to expire, and he has to convince the owners. For a newly established farmer, this may be somewhat more difficult (lack of trust on the part of the landowners) than for a long-established former CAE. The tenant in the former CAE typically has more chances to conclude the transaction.
initiative is mostly on the part of the tenant, and it is the tenant who will initiate a change when it is in his best interests to do so. As for the landowners, they will not so easily change their tenure relations. The reason is the particular land property and use structure in Ukraine, which as a legacy of the planned economy has led to a very unequal ratio of relatively few large tenants (probably around 14 thousand) to many small landowners (about 7 millions).

3 How high transaction costs hamper competition in the land market

As already explained in the previous section, high transaction costs for land market transactions can be found in Ukraine. These costs are mainly a burden for landowners willing to transact land, while most tenants can act more easily. This creates a power asymmetry on the land lease market. Large farms can exercise a certain degree of market power (in this case monopsony power), which means that they can force the price of leased land below the level which would be determined by the market if the size relations were more equitable. Landowners often have little choice but to lease, and often have little choice regarding to whom they can lease their land. The immediate consequences are:

- Land market transactions are relatively seldom.
- The land use patterns change only slowly.
- The emergence of new small and medium-sized farms is going at a slow pace.
- Land lease prices are relatively low.
- Land prices (as a property item) are low as well; and,
- Land is not attractive as collateral for credits.

This list of consequences allows us to construct the following causal chain: land property/use structures create an unequal distribution of land market transaction costs. These lead to monopsonistic land market relations that, in turn, mean thin land markets and depressed prices for land. In the end, low land prices are a reason for the lack of credit due to the low level of collateral value. This creates problems for exactly the same large farms which seem to benefit from the current situation of low land lease prices. However, in the long run the number of landowners will probably decline due to sales to large farms or investors. This will lower the transaction costs in land markets and thus ease the “migration” of land to the better farmers.

4 Competition for land and lease prices: Some empirical evidence

The considerations above suggest that where there are several farmers on the land of a former CAE, the competition among them for lease land should lead to higher land prices. Tables 7.1 and 7.2 present information on land lease payments and the number of tenant farms competing for lease land. This information clearly indicates that there is a direct positive correlation between the number of competing farms on the land market and the level of the lease payments – the higher the competition level, the higher is the level of lease payments.
Table 7.1: The relationship between the number of tenant farmers per thd. ha and the level of the lease payments per ha across all oblasts of Ukraine in 2001

<table>
<thead>
<tr>
<th>Tenant farmers per thd. has</th>
<th>Number of oblasts in a group</th>
<th>Land lease payments UAH per ha Minimum</th>
<th>Maximum</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>46.0</td>
<td>68.3</td>
<td>57.1</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>48.3</td>
<td>103.6</td>
<td>71.6</td>
</tr>
<tr>
<td>3 and more</td>
<td>14</td>
<td>57.1</td>
<td>116.0</td>
<td>84.5</td>
</tr>
</tbody>
</table>

Source: STATE STATISTICS COMMITTEE OF UKRAINE (2002a); own calculations.

Of course, lease payments are influenced by other factors as well, such as the climate zone and soil quality. For instance, the Transkarpathian region has the highest level of farms per thd. ha (28 farms). But this region represents a special case where natural conditions play a key role – limited quantity of land, which is moreover difficult to work due to its hilly profile. To eliminate these factors, we compare two oblasts which have the same natural conditions but different levels of land lease competition (see table 7.2). In Kharkiv oblast, where there is only one farm per thd. ha of leased land, the lease payment is 68.3 UAH/ha and year. In Kherson oblast with 5 farms per thd. ha, average lease payments are 110.5 UAH/ha or 61.8% higher than in Kharkiv. In Kherson, higher levels of average profit per farm and per ha are found, but at the same time the yields of grain and sunflower seeds, the main commercial crops, are lower in Kherson than in Kharkiv (grain 26.5 and 30.2 dt/ha, respectively; sunflower seed 5.5 and 12.4 dt/ha, respectively). Hence, greater competition for lease land has not hindered farms in Kherson from becoming more profitable than their counterparts in Kharkiv. Competition in the land market leads to higher farm productivity and efficiency, because competition helps to drive under-performers out of the market.

Table 7.2: Main indicators of agricultural enterprises’ activities in Kharkiv and Kherson oblasts in 2001

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Kharkiv oblast (with ~ 1 farm per 1 000 ha)</th>
<th>Kherson oblast (with ~ 5 farms per 1 000 ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Size of farms, ha</td>
<td>10</td>
<td>10974</td>
</tr>
<tr>
<td>Number of workers per farm</td>
<td>2</td>
<td>980</td>
</tr>
<tr>
<td>Value of assets, thd. UAH</td>
<td>6</td>
<td>109768</td>
</tr>
<tr>
<td>Profit, thd. UAH</td>
<td>2</td>
<td>980</td>
</tr>
<tr>
<td>Profit, UAH per ha</td>
<td>0.1</td>
<td>7069</td>
</tr>
<tr>
<td>Lease payment, UAH per ha</td>
<td>2.2</td>
<td>483.3</td>
</tr>
</tbody>
</table>

Source: STATE STATISTICS COMMITTEE OF UKRAINE (2002b); own calculations.

To study these questions in greater detail, the results of a small econometric analysis are presented in the following. The dependent variable in the analysis is the average lease price in an oblast, while soil quality and the competition for lease land are chosen as explanatory variables. The average yield (in dt/ha) of wheat in an oblast serves as a proxy for soil quality, while competition is reflected in the ratio between former CAEs and new private family farms as reported in regional statistics. The higher the ratio of private to former collective farms (labelled Farm Ratio below), the higher is the assumed level of
competition for farmland. The results of the regression are presented in the following equation (with standard errors in square brackets)\(^1\):

\[
\text{Lease price} = 5.351 + 2.540(\text{Yield}) + 2.976(\text{Farm ratio}) \quad R^2 = 0.445
\]

\[
[25.023] \quad [1.071] \quad [1.138]
\]

These estimates can be interpreted as follows: an increase in the yield by dt/ha increases the lease price by 2.54 UAH/ha, while a doubling of the number of private farmers keeping the number of former CAEs constant increases the lease payment by 2.98 UAH/ha. Hence, as expected the results reveal a clearly positive relation between soil quality (proxied by yield levels) and lease prices. But the interesting finding is that the more private farms exist in comparison to former CAEs, the higher are the lease prices in a region. The more private farms the bigger the land market, the more intense the competition for land, and the higher the lease prices. The R\(^2\) of 0.445 signals that the fit of the regression is fairly good, as almost 45% of the variation in actual lease prices is explained by the exogenous variables.

Figure 7.1 compares the actual and the estimated lease price in each oblast, corrected for the influence of regional yield levels. The positive relation between competition in the form of more private farms per former CAE in a region and land lease prices is clear. At first glance this relationship will benefit landowners, many of whom are pensioners who are dependent on additional income due to low pension entitlements. Of course, higher land lease prices increase costs for agricultural enterprises who rent land. However, private farms may benefit from higher land prices relative to former CAEs. Their share of own land is much higher than for the former CAEs, and a higher value of this asset will increase their access to long-term credit.

\(^1\) A more detailed presentation of the data employed and the regression results can be found in the Appendix.
Figure 7.1: The relationship between competition (ratio of private farms to former collective agricultural enterprises) and yield-corrected lease payments in the oblasts of Ukraine

![Graph showing the relationship between competition and lease payments.]

Source: Own calculations using the data and regression results in the Appendix.

5 Recommendations

In order to increase the competition for lease land, the conditions for setting up new private farms should be improved. A possible contribution of agricultural policy could be to avoid any discrimination against small farms when it comes to subsidies and other support. Beyond that, the following approaches could be pursued:

1. The empirical results of this study show that private family farms can play a key role in creating livelier markets for lease land. Local authorities should create the necessary conditions for the development of private family farms. They should help potential farmers with farm registration and getting land titles.

2. On the national level the land legislation should be improved. This concerns the law on the distribution of land parcels among the landowners, and possibilities to exchange the land parcels in case of changing the lessees.

3. The high costs of land transactions could be lowered by institutional innovations. Any steps suited to improve the access to information for landowners could help small market agents to find business partners: both those willing to exchange land plots, and alternative lease takers. An improved framework for the role of real estate agents in rural areas could help to create the critical mass of supply and demand necessary for the Ukrainian land market to function.
4. The state still owns a lot of agricultural land which needs to be distributed. The manner in which this is done can have a very important influence on local land markets, creating or stifling competition.

5. Moreover, information campaigns and legal recourse have to be offered to landowners, most of them poor people living in remote places. The rights of land-owning peasants who are perhaps not accustomed to standing up to local authorities must be protected, especially since these peasants are often very dependent on the goodwill of local authorities and can be subjected to considerable pressure.

6 References


STATE STATISTICS COMMITTEE OF UKRAINE (2002b): The main economic indicators of farms activity of Kharkiv and Kherson oblasts for 2001 (Form # 50 S/H).

7 Appendix

Appendix Table 7.1: Detailed regression results – lease prices as a function of soil quality and competition intensity using data from 25 oblasts in Ukraine

<table>
<thead>
<tr>
<th>Multiple Correlation</th>
<th>0.667</th>
</tr>
</thead>
<tbody>
<tr>
<td>R^2</td>
<td>0.445</td>
</tr>
<tr>
<td>Adjust. R^2</td>
<td>0.395</td>
</tr>
<tr>
<td>Standard Error</td>
<td>14.449</td>
</tr>
<tr>
<td>Observations</td>
<td>25</td>
</tr>
</tbody>
</table>

ANOVA

<table>
<thead>
<tr>
<th>Degrees of freedom</th>
<th>F-Value</th>
<th>F critical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2</td>
<td>8.822</td>
</tr>
<tr>
<td>Residue</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Gesamt</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t-Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.351</td>
<td>25.023</td>
<td>0.214</td>
</tr>
<tr>
<td>Average yield 1999-2001</td>
<td>2.540</td>
<td>1.071</td>
<td>2.372</td>
</tr>
<tr>
<td>Farm ratio</td>
<td>2.976</td>
<td>1.138</td>
<td>2.616</td>
</tr>
</tbody>
</table>

Source: Own calculations using the data in Appendix table 7.2.
### Appendix Table 7.2: Data on land lease in the oblasts of Ukraine (2001)

<table>
<thead>
<tr>
<th>Oblast</th>
<th>Total land lease payments, thd. UAH</th>
<th>Land in lease, thd. ha</th>
<th>Lease payment per ha, UAH</th>
<th>Number of former CAEs</th>
<th>Number of private family farms</th>
<th>Ratio private farms/ former CAEs (&quot;Farm ratio&quot;)</th>
<th>Farm density (# per thd. ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimea</td>
<td>90864</td>
<td>783</td>
<td>116.0</td>
<td>394</td>
<td>1860</td>
<td>4.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Vinnytsya</td>
<td>94407</td>
<td>1095</td>
<td>86.2</td>
<td>886</td>
<td>12389</td>
<td>1.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Volyn</td>
<td>27263</td>
<td>415</td>
<td>65.7</td>
<td>453</td>
<td>571</td>
<td>1.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Dnipropetrovsk</td>
<td>95712</td>
<td>1167</td>
<td>82.0</td>
<td>467</td>
<td>3265</td>
<td>7.0</td>
<td>3.2</td>
</tr>
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<td>Donetsk</td>
<td>87625</td>
<td>920</td>
<td>95.2</td>
<td>518</td>
<td>2192</td>
<td>4.2</td>
<td>2.9</td>
</tr>
<tr>
<td>Zhytomyr</td>
<td>41765</td>
<td>871</td>
<td>48.0</td>
<td>721</td>
<td>596</td>
<td>0.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Transkarpathian</td>
<td>4244</td>
<td>59</td>
<td>71.9</td>
<td>229</td>
<td>1420</td>
<td>6.2</td>
<td>27.9</td>
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<tr>
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<td>98845</td>
<td>1078</td>
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<td>392</td>
<td>2387</td>
<td>6.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Ivano-Frankivsk</td>
<td>8672</td>
<td>130</td>
<td>66.7</td>
<td>252</td>
<td>658</td>
<td>2.6</td>
<td>7.0</td>
</tr>
<tr>
<td>Kiev</td>
<td>70569</td>
<td>821</td>
<td>86.0</td>
<td>639</td>
<td>1415</td>
<td>2.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Kirovograd</td>
<td>87072</td>
<td>1012</td>
<td>86.0</td>
<td>464</td>
<td>2451</td>
<td>5.3</td>
<td>2.9</td>
</tr>
<tr>
<td>Luhansk</td>
<td>6106</td>
<td>958</td>
<td>63.7</td>
<td>396</td>
<td>1531</td>
<td>3.9</td>
<td>2.0</td>
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<tr>
<td>L’viv</td>
<td>16695</td>
<td>251</td>
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<td>583</td>
<td>1190</td>
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<td>7.1</td>
</tr>
<tr>
<td>Mykolaiv</td>
<td>71317</td>
<td>799</td>
<td>89.3</td>
<td>444</td>
<td>4373</td>
<td>9.8</td>
<td>6.0</td>
</tr>
<tr>
<td>Odesa</td>
<td>101434</td>
<td>1223</td>
<td>82.9</td>
<td>758</td>
<td>5393</td>
<td>7.1</td>
<td>5.0</td>
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<tr>
<td>Poltava</td>
<td>83716</td>
<td>1201</td>
<td>69.7</td>
<td>618</td>
<td>1477</td>
<td>2.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Rivne</td>
<td>27516</td>
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<td>60.6</td>
<td>376</td>
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<td>1.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Sumy</td>
<td>55329</td>
<td>973</td>
<td>56.9</td>
<td>578</td>
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<td>1.4</td>
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<td>721</td>
<td>1.2</td>
<td>2.6</td>
</tr>
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<td>Karkiv</td>
<td>89067</td>
<td>1304</td>
<td>68.3</td>
<td>532</td>
<td>1298</td>
<td>2.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Kherson</td>
<td>70526</td>
<td>638</td>
<td>110.5</td>
<td>319</td>
<td>3080</td>
<td>9.7</td>
<td>5.3</td>
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<tr>
<td>Khmelnytskyi</td>
<td>66163</td>
<td>880</td>
<td>75.2</td>
<td>720</td>
<td>1090</td>
<td>1.5</td>
<td>2.1</td>
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<tr>
<td>Cherkasy</td>
<td>93318</td>
<td>901</td>
<td>103.6</td>
<td>595</td>
<td>879</td>
<td>1.5</td>
<td>1.6</td>
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<tr>
<td>Chernivtsi</td>
<td>13588</td>
<td>169</td>
<td>80.4</td>
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<td>633</td>
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<td>Chernihiv</td>
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<td>46.0</td>
<td>618</td>
<td>532</td>
<td>0.9</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Source:** STATE STATISTICS COMMITTEE OF UKRAINE (2002a); own calculations.
8 The Organisational Forms and Performance of Agricultural Enterprises in Ukraine: What Conclusions can be Drawn?

SERHIY DEMYANENKO & STEPHAN VON CRAMON-TAUBADEL

1 Introduction

One of the main goals of agricultural policy reform in general and the reorganisation of collective agricultural enterprise in particular is to enhance the efficiency and competitiveness of domestic agricultural production. One way to achieve this is to create conditions under which agricultural enterprises can evolve in accordance with market requirements. Critical steps towards the creation of such conditions were taken in Ukraine for example in December 1999 (Presidential Decree “On accelerating reforms in Agricultural Sector of Ukraine”) and in 2001 with the adoption of a new Land Code. As a result, the structure of agricultural enterprises in Ukraine changed more in 2000 and 2001 than in the previous almost nine years of transition, and the heterogeneity of existing forms of agricultural enterprise has increased dramatically.

What lessons can be drawn from this experience? Using data on the results of the economic activity of agricultural enterprises in Ukraine, and detailed data on agricultural enterprises in Cherkasy Oblast, we focus on two important lessons in particular. The first concerns the issue of organizational form. Many policy makers and analysts in Ukraine continue to talk in terms of ‘optimal’ enterprise sizes and structures in agriculture. The data illustrates that this can be misleading and distracts from more important issues. The second lesson concerns the (mis)use of information on average performance when designing agricultural policies. Policy decisions based on average economic indicators will often ‘miss the mark’ considerably, providing unnecessary assistance to above-average enterprises in agriculture, and too little assistance to below-average enterprises. In the following two sections we deal with these two lessons in turn, before drawing conclusions in section 4.

2 The organisational forms and performance of agricultural enterprises in Ukraine

In the course of agricultural reform, an integral part of which was the reorganisation of the so-called CAEs (collective agricultural enterprises), several organisational forms of agricultural enterprises have emerged that are new to Ukraine. These include private agricultural enterprises, farms, agricultural companies (mainly limited liability companies) and agricultural production co-operatives. The main goal of this reorganisation and creation of new organisational forms was to enhance the efficiency of agriculture in Ukraine by establishing private ownership for production factors and providing factor owners and managers with market driven incentives.

The switch from collective to individual forms of farming is perhaps the defining feature of organisational form changes over the last 2 years. The general trend is towards a reduction in the total number of agricultural enterprises and their size in the course of restructuring. This trend is driven by the creation of large lease enterprises and small private
family farms on the basis of restructured CAEs. The number of small private family farms increased from 38.4 thd. in 2000 to 43 thd. in 2003 and their agricultural land increased for this period from 2157.6 thd. ha to 3094.6 thd. ha or on 43.4%. As illustrated in table 8.1, this feature is reflected in the number of private and family farms that is falling less slowly than the number of cooperatives. Between 2001 and 2003, the number of private agricultural enterprises and family farms decreased by 462 or 15.6%. The number of agricultural companies decreased by 1261 units or 18.1%. Meanwhile the number of production co-operatives declined by 713 units or 32.9%. The same tendencies occur with agricultural land. Generally speaking, agricultural production co-operatives have many features of the former kolkhozes. Dissatisfaction with this form of organisation on the part of members as well as its disappointing economic performance¹ are the mains reason for the decline in the number of production co-operatives.

Table 8.1: The number of enterprises and land that had emerged from collective agricultural enterprises as of 2001 and as of 2003, by organisational form

<table>
<thead>
<tr>
<th>Organizational form</th>
<th>2001</th>
<th>2003</th>
<th>Change</th>
<th>Change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Agricultural land, thd. ha</td>
<td>Number</td>
<td>Agricultural land, thd. ha</td>
</tr>
<tr>
<td>Private enterprises and family farms</td>
<td>2967</td>
<td>4580</td>
<td>2505</td>
<td>4046</td>
</tr>
<tr>
<td>Agricultural companies</td>
<td>6970</td>
<td>13982</td>
<td>5709</td>
<td>11912</td>
</tr>
<tr>
<td>Agricultural productive co-operatives</td>
<td>2165</td>
<td>3954</td>
<td>1452</td>
<td>2834</td>
</tr>
</tbody>
</table>

Source: STATE STATISTICS COMMITTEE OF UKRAINE (2002a and 2004); own calculations.

Thus, the statistical information presented here supports the idea that an individualisation process (a switch from collective to individual organisational forms) is taking place in Ukrainian agriculture. While the numbers of all types of agricultural enterprise are falling, private enterprises are falling at the slowest pace, both in terms of number and share of land. This process is accompanied by a concentration of the land and property of the former CAEs into the hands of one or a few persons. This tendency to individualisation is bringing Ukrainian agriculture more into line with agriculture in the rest of the world. Note that the trend towards individual ownership does not necessarily imply the creation small-sized enterprises. Experience both in Ukraine and elsewhere shows that a private enterprise or a family farm can be large and make use of thousands hectares of leased land. Certainly, in the industrialised countries of Europe and North America, the trend towards larger farm structures and consolidation is clear, even though the family farm continues to dominate in these countries.

Table 8.2 presents information on the size and performance of agricultural enterprises by organisational form in Cherkasy oblast in 2001². The data reveal that on average there are no substantial differences in the sizes of private farms, companies and co-operatives. This is

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¹ We are referring here to the economic performance of co-operatives on average. This does not preclude some co-operatives performing comparatively well (see below).
² Chapter 9 Farm Efficiency and Productivity Growth in Ukraine presents an analysis of farm efficiency and its determinants (including organisational form) in Ukraine based on a detailed econometric analysis.
true for acreage farmed, the average number of workers employed, production costs and total sales. As for profit, on average it is much higher for private farms than for companies and co-operatives. This supports the argument that individualised forms of asset ownership generate greater incentives to operate efficiently.

Note that the range of variation of profit is considerably higher in companies than in private farms and co-operatives. Furthermore, the largest companies are much larger than the largest private farms or co-operatives, when measured in terms of acreage farmed, capital and total sales. This illustrates that there is great heterogeneity within the individual categories – especially companies – in table 8.2. One must therefore be very cautious when drawing conclusion about the performance of companies or co-operatives in general. In terms of profit, the best co-operatives perform quite well, even though co-operatives perform worse than other categories on average. It would therefore be unreasonable to attempt to define or even prescribe an ‘optimal’ organisational form for agricultural enterprises in Ukraine. A form that works well in one setting may not work well in others.

Table 8.2: Characteristics and performance of agricultural enterprises in Cherkasy oblast by organisational form in 2001

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Coeff. of variation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Private farms (57)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm land, ha</td>
<td>6</td>
<td>3972</td>
<td>1467</td>
<td>926</td>
<td>0.63</td>
</tr>
<tr>
<td>Number of workers</td>
<td>3</td>
<td>438</td>
<td>141</td>
<td>101</td>
<td>0.74</td>
</tr>
<tr>
<td>Fixed and current assets, thd. UAH</td>
<td>12</td>
<td>14296</td>
<td>3589</td>
<td>101</td>
<td>0.99</td>
</tr>
<tr>
<td>Production costs, thd. UAH</td>
<td>14</td>
<td>4153</td>
<td>1099</td>
<td>3539</td>
<td>0.94</td>
</tr>
<tr>
<td>Sales revenue, thd. UAH</td>
<td>17</td>
<td>6963</td>
<td>1406</td>
<td>1432</td>
<td>1.02</td>
</tr>
<tr>
<td>Profit, thd. UAH</td>
<td>-373</td>
<td>3004</td>
<td>134</td>
<td>485</td>
<td>3.62</td>
</tr>
<tr>
<td>Profit per hectare, UAH</td>
<td>-220</td>
<td>756</td>
<td>86</td>
<td>173</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Companies (450)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm land, ha</td>
<td>3</td>
<td>35500</td>
<td>1688</td>
<td>1892</td>
<td>1.12</td>
</tr>
<tr>
<td>Number of workers</td>
<td>2</td>
<td>3065</td>
<td>162</td>
<td>172</td>
<td>1.06</td>
</tr>
<tr>
<td>Fixed and current assets, thd. UAH</td>
<td>2</td>
<td>53378</td>
<td>4908</td>
<td>5690</td>
<td>1.16</td>
</tr>
<tr>
<td>Production costs, thd. UAH</td>
<td>28</td>
<td>44791</td>
<td>1461</td>
<td>2616</td>
<td>1.79</td>
</tr>
<tr>
<td>Sales revenue, thd. UAH</td>
<td>22</td>
<td>55291</td>
<td>1702</td>
<td>3201</td>
<td>1.88</td>
</tr>
<tr>
<td>Profit, thd. UAH</td>
<td>-1394</td>
<td>3720</td>
<td>72</td>
<td>422</td>
<td>5.84</td>
</tr>
<tr>
<td>Profit per hectare, UAH</td>
<td>-19651</td>
<td>9467</td>
<td>16</td>
<td>1341</td>
<td>82.5</td>
</tr>
<tr>
<td><strong>Cooperatives (45)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm land, ha</td>
<td>12</td>
<td>3836</td>
<td>1846</td>
<td>931</td>
<td>0.50</td>
</tr>
<tr>
<td>Number of workers</td>
<td>21</td>
<td>481</td>
<td>211</td>
<td>107</td>
<td>0.52</td>
</tr>
<tr>
<td>Fixed and current assets, thd. UAH</td>
<td>520</td>
<td>29560</td>
<td>8967</td>
<td>6513</td>
<td>0.73</td>
</tr>
<tr>
<td>Production costs, thd. UAH</td>
<td>79</td>
<td>3570</td>
<td>1477</td>
<td>786</td>
<td>0.53</td>
</tr>
<tr>
<td>Sales revenue, thd. UAH</td>
<td>77</td>
<td>4469</td>
<td>1683</td>
<td>990</td>
<td>0.59</td>
</tr>
<tr>
<td>Profit, thd. UAH</td>
<td>-904</td>
<td>1649</td>
<td>51</td>
<td>374</td>
<td>7.50</td>
</tr>
<tr>
<td>Profit per hectare, UAH</td>
<td>-10112</td>
<td>7067</td>
<td>-115</td>
<td>1918</td>
<td>-16.7</td>
</tr>
</tbody>
</table>

Source: STATE STATISTICS COMMITTEE OF UKRAINE (2001c); own calculations.

It is also unreasonable to attempt to define an ‘optimal’ size for agricultural enterprises, or ‘optimal’ sizes according to agro-climatic zone or type of production, etc.

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3 Note that the co-operatives in Cherkasy generated losses of 115 UAH/ha on average in 2001, while average profits per farm were positive at 51 thd. UAH. This can be explained by the very large losses incurred by some co-operatives that specialise in livestock production on small areas.
Analysis of the data reveals that size has no clear and unequivocal impact on enterprise performance in Ukrainian agriculture. One enterprise might perform very successfully with 10 ha, while another does the same with 100 ha. This is not surprising, and has been found to hold in other countries as well. Of course, in purely technical or engineering terms, there may be an optimal size for a certain production process. In general, larger enterprises will benefit from scale efficiencies that enable them to produce units of output at a lower cost than smaller enterprises. However, managing an agricultural enterprise involves much more than optimising technical processes, and technical efficiency is only one of the many factors that contribute to enterprise performance. For example, the ability to manage, motivate and monitor workers is at least as important. As farms get larger, the costs of monitoring labour grow. It becomes more difficult to control shirking and even theft or sabotage, and the link between individual effort and individual reward becomes more difficult to establish. At some point the associated costs will cancel out any technical efficiency that might result from further growth. Different managers in different settings using different organisational forms will each find their own optimal compromise between these competing factors. Any attempt to define or prescribe optimal sizes will not do justice to this heterogeneity.

This heterogeneity, by the way, is exceedingly valuable. Each agricultural enterprise, with its unique characteristics in its unique setting represents an experiment in which a specific organisational form, size and strategy is tested. Some experiments succeed while other fail, and in the process new ideas and new information on how to manage an agricultural enterprise and how to avoid pitfalls is generated. It has often been stated that one of the great weaknesses of current Ukrainian agriculture is that most farm managers are not willing to experiment; many are too accustomed to simply following norms passed down from above. Agricultural enterprises should be encouraged to experiment and to seek solutions to problems that are tailored to the specific conditions on individual farms. Policy makers should not try to ‘homogenise’ enterprise structures and sizes, but rather should allow the combination of heterogeneity and market disciplines to drive agriculture towards new solutions and greater efficiencies.

This is not to say that scientists should not study the question of optimal sizes and the tradeoffs between technical efficiencies on the one hand and management inefficiencies on the other. Such studies may be able to identify trends and to contribute to our understanding of the forces shaping the evolution of agricultural enterprise structures. For example, as grain-producing technology develops, it is becoming increasingly possible to replace labour with capital, thus making it possible to increase technical efficiency and reduce the costs of motivating and monitoring workers. The result is a clear trend to increasing sizes of grain enterprises, for example in the EU.

Indeed, it may be that many grain farms in Ukraine are much closer to the optimal size, however defined, than farms in the EU and elsewhere. However, this is contingent on Ukrainian grain enterprises employing the modern, capital intensive and labour extensive grain production technology referred to above. Given the current scarcity of capital and abundance of labour in Ukraine, employing this technology may not be possible. Under Ukrainian conditions it may make sense to employ more labour intensive technologies, even if this entails somewhat smaller enterprise sizes. But this is not something to be decided or imposed by academicians, consultants or bureaucrats; the natural market ‘laboratory’ described above is a discovery mechanism that will find the best answer(s) quickly and flexibly. The degree to which agriculture in the Former Soviet Union lagged behind the
West, in terms of technology but especially in terms of management practice, demonstrates how much dynamic is lost when policy makers put an end to this experimentation and dictate rigid structures.

3 The (mis)use of average indicators of agricultural enterprise performance

The heterogeneity discussed above also has the important implication that average indicators of agricultural enterprise performance often say little about actual conditions on the vast majority of the individual enterprises. Hence, it is often not very sensible to draw conclusions about the activity, performance and policy needs of agricultural enterprises in general on the basis of average indicators.

Figure 8.1 depicts the development of profitability levels for Ukrainian agricultural enterprises on average, for enterprises in Cherkasy oblast on average, for Zolotonisky rayon on average, and for one of the best enterprises in Zolotonisky. Table 8.3 contains information on minimum, maximum and average values as well as the variation of the main indicators characterising agricultural enterprises in Zolotonisky district. Obviously, average indicators differ drastically from minimum and maximum values.

Figure 8.1: Agricultural enterprise profitability in Ukraine, in Cherkasy oblast, in Zolotonisky rayon, and on one of the best agricultural enterprises in Zolotonisky rayon.

Source: STATE STATISTICS COMMITTEE OF UKRAINE (2001a, p. 127); STATE STATISTICS COMMITTEE OF UKRAINE (2002b, p.2).

Zolotonisky is a rayon or district in Cherkasy oblast.
As can be seen in table 8.3, the profits per hectare for agricultural enterprises in Zolotonisky range from -473 to +4614 UAH, with an average value of 173 UAH. Capital investments range from 5.22 UAH/ha to 3003 UAH/ha, with an average value of 247 UAH/ha. Corresponding figures for the rate of profitability are -63.9, 88.3 and -2.57%, respectively; for current assets they are 208, 11874 and 1332 UAH/ha. Note that table 8.3 contains data only for enterprises located in one rayon. Clearly, if we were to look at the results of economic activity of agricultural enterprises in Cherkasy oblast or Ukraine as a whole, the differences between minima and maxima would be even greater.

Given these differences, how effective are agricultural policies that are based on average indicators? Imagine that parliament were to pass a law that provides for an agricultural subsidy that is calculated to ensure that the average farm in Ukraine attains a 10% rate of profitability. For many agricultural enterprises that are below average, this subsidy would be too small to make them profitable. On the other hand, enterprises that are profitable already (and such enterprises exist, see table 8.3) would receive an unnecessary ‘windfall’. As a result, the money spent on the subsidy would not yield the expected results.

Agricultural policy making on the basis of average performance indicators can be compared with medicine. Does it make sense to treat a hospital patient on the basis of the average body temperature of all patients in the hospital? This average temperature might be, for instance, 37°C. But this is of little help to those whose temperature is 35 or 40°C. Applying a uniform treatment would be wasteful at best, and dangerous at worst. Agricultural policy discussions in Ukraine sometimes fall into a similar trap. The exemption from the uniform agricultural tax is justified by reference to the fact that the average profitability of agricultural enterprises in Ukraine is too low. This may be true, but the tax exemption provides the same amount of support per hectare to all enterprises, regardless of their profitability. The least profitable enterprises receive too little support to make a meaningful difference in their situation, while the most profitable enterprises are permitted to escape from their obligation to contribute a fair share to state revenues.

Basing policy on averages is based on the false assumption that all farms are homogeneous and potentially profitable and thus deserve support to help them attain profitability. In reality, many agricultural enterprises in Ukraine are not viable\(^5\). The sooner these enterprises are forced to exit the sector, the sooner their assets can be re-employed by better managers, and the sooner the government can redirect the support they receive towards enterprises that have a real chance to become profitable, or to reducing social hardships in rural areas in a targeted manner.

\[^5\] Chapter 11 *Farm Management Challenges in Ukrainian Agriculture* contains a discussion of different levels of intensity and profitability in Ukrainian crop production in the forest-steppe zone that also identifies a significant proportion of non-viable enterprises.
Table 8.3: Main indicators of economic activity of the agricultural enterprises in Zolotonisky rayon in 2001

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Coeff. of variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit, thd. UAH</td>
<td>-1334</td>
<td>3720</td>
<td>258</td>
<td>980</td>
<td>3.79</td>
</tr>
<tr>
<td>Profit per hectare, UAH</td>
<td>-473</td>
<td>4614</td>
<td>173</td>
<td>805</td>
<td>4.64</td>
</tr>
<tr>
<td>Capital investments per hectare, UAH</td>
<td>5.22</td>
<td>3003</td>
<td>247</td>
<td>486</td>
<td>1.97</td>
</tr>
<tr>
<td>Profitability, %</td>
<td>-63.9</td>
<td>88.3</td>
<td>-2.57</td>
<td>26.89</td>
<td>-10.46</td>
</tr>
<tr>
<td>Current assets per hectare, UAH</td>
<td>208</td>
<td>11874</td>
<td>1332</td>
<td>1837</td>
<td>1.38</td>
</tr>
<tr>
<td>Current liabilities per hectare, UAH</td>
<td>42.5</td>
<td>7760</td>
<td>846</td>
<td>1248</td>
<td>1.48</td>
</tr>
</tbody>
</table>

Source: STATE STATISTICS COMMITTEE OF UKRAINE (2001b); own calculations.

4 Conclusions and recommendations

- Ukrainian agriculture displays a clear trend to individualisation. This can be observed as an increase in the relative size and number of private enterprises and family farms, and a steady decline in the relative number and size of agricultural production co-operatives, which differ little from the former kolkhozes. This trend is in accordance with worldwide experience in agriculture. Individualisation, however, does not imply the creation of small-sized agricultural enterprises. Private enterprises and family farms founded on the basis of CAEs tend to be large based land and property leasing from the former members of CAEs. Furthermore, the size of an enterprise is not a criterion of its efficiency.

- Although private farms and co-operatives founded on the basis of CAEs are approximately the same in size, private enterprises and family farms on average generate more profits per hectare of land than agricultural production co-operatives. This may indicate that co-operatives suffer from some organisational weaknesses compared with other forms. At the same time, however, the best co-operatives perform as well as the best private enterprises and companies. Hence, there is no ‘optimal’ organisational form for agricultural enterprises; different solutions will work in different situations.

- Analysis of the main indicators reveals that size has little impact on the economic performance of agricultural enterprises. Performance depends on specialisation and the optimal combination of production factors – land, capital, labour and especially management. Determining the optimal size of an agricultural enterprise is not just a question of optimising technical or engineering processes. Management, especially the management of labour, becomes increasingly critical as farm size increases, and may make it impossible to reap all of the potential technical benefits of size.

- Policy makers should view agriculture as a giant laboratory in which farms change, adapt and try to find the best possible sizes, organisational forms and strategies to suit their individual conditions. They should not attempt to dictate sizes and organisation forms, but rather should allow the combination of experimentation and market disciplines to generate innovations and new solutions.

- It can be very misleading to draw conclusions about the performance of agricultural enterprises and to design agricultural policies on the basis of average indicators in a district, oblast or the country as a whole. Such policies will lead to a waste of state funds and will not yield desirable results. There are huge differences between the
values of the indicators describing the worst and the best agricultural enterprises. Average values are therefore not very representative of the real situation in agricultural sector. Policy makers should employ policy tools that can be focused at enterprises that need and can make use of support.

5 References

Introduction

Transition from a planned to a market-oriented economy has proved to be a painstaking process for almost all Central and Eastern European countries. Nevertheless, studies that compare the successes and failures of these countries (e.g. LERMAN et al., 2004) demonstrate convincingly that market orientation brings about improved efficiency and favours efficient resource allocation. The first ten years of transition in Ukrainian agriculture were marked by a persistent decline in output. Agricultural output in 2000 accounted only for 53% of the 1990 level, and it is only since 2000 that it has begun to recover. A natural question arises: why did market mechanisms fail to produce the expected improvements and to which factors can the observed patterns of development in Ukrainian agriculture be attributed?

Generally, a decline in output can be explained by a reduction in input usage, a fall in pure technical efficiency (i.e. by less efficient utilization of resources), a decline in scale efficiency (i.e. a deviation from scale efficient output levels) and technological regress. All these factors contribute to changes in production levels and their effects may run opposite directions; that is, production increases due to technological progress and may be dwarfed by a simultaneous deterioration of technical efficiency. To which factors an increase (or decrease) in output can be attributed is an empirical question. It is the goal of this paper to analyze the effect of each of these factors on productivity changes in Ukrainian agriculture between 1996 and 2000.

Efficiency analysis is important for several reasons. First, at the aggregate level the decomposition of productivity changes may be valuable for policy-makers, since it reveals potential sources of productivity growth and, possibly, output expansion. Furthermore, efficiency analysis at the farm level may be helpful in determining optimal farm size, the optimal resource mix and the minimum amounts of inputs required to produce a given output.

We estimate technical and allocative efficiencies at the level of individual agricultural enterprises and analyse the links between an enterprise’s efficiency and its ownership pattern. An effort is also made to determine optimal input ratios and optimal amounts of each input required to produce a unit of output. At the aggregate level, we review the trends in Ukrainian agriculture over a five-year period and provide a comprehensive analysis of the changes in productivity, technical efficiency and technological change.

Chapter 8 The Organisational Forms and Performance of Agricultural Enterprises in Ukraine: What Conclusions can be Drawn? includes a discussion of ‘optimal’ farm sizes in which it is stressed that this is not an absolute ‘one size fits all’ concept but rather, as used here, something that changes from farm to farm as a function of factors such as natural conditions, management skills, proximity to input and output markets, etc.
The chapter is organized as follows. Section 2 describes the methodology employed. Section 3 contains a discussion of the data used. The rest of the study actually consists of two separate analyses. The first of these in section 4 focuses on the analysis of particular agricultural enterprises in 5 central regions of Ukraine. The second in section 5 covers the performance of agricultural enterprises at the regional level from 1996 through 2000 and, thus, aims at explaining changes in Ukrainian agriculture as a whole. Section 6 presents implications and policy recommendations.

2 Methodology

We employ Data Envelopment Analysis (DEA). The advantage of this (non-parametric) approach over parametric approaches applied to Ukrainian and Russian agriculture (VOIGT, 2002; KURKALOVA & JENSEN, 2002) is that it assumes no specific form of production function.

The efficiency of a firm usually refers to its ability to extract a maximum output from a given set of inputs (output-oriented technical efficiency). Alternatively, efficiency can mean the ability to produce a given amount of output using a minimum amount of inputs (input-oriented technical efficiency). Both statements are interchangeable under the assumption of constant returns to scale and which is used depends on the optimisation behaviour of the producing unit. If the enterprise maximises revenue then the former formulation is appropriate; however, if the enterprise minimises costs, then the latter formulation is. We assume here that agricultural enterprises act as revenue maximizing decision-making units. Under the planned economy agricultural enterprises were given output targets and were supposed to achieve these targets, even at the cost of highly inefficient resource use. At the outset of transition, input supplies by the state to agricultural enterprises began to decline and soft budget constraints were eliminated. This induced agricultural producers to use inputs more efficiently. It is reasonable to assume that facing hard budget constraints and scarcity of resources such as capital, agricultural producers will try to extract as much as possible from a set of available resources. Hence, in our analysis we focus on output-oriented measures of efficiency.

DEA is based on the construction of a best-practice frontier. This is achieved by solving the following linear optimization problem for each observation in the sample:

\[
F_k^t = \max \lambda
\]

subject to

\[
\lambda y_{k,m}' \leq \sum_{k=1}^{K} z_k' y_{k,m}', \ m = 1, \ldots, M
\]

\[
x_{k,n}' \geq \sum_{k=1}^{K} z_k' x_{k,n}', \ n = 1, \ldots, N
\]

\[
z_k' \geq 0, \ \sum_{k=1}^{K} z_k' = 1 \quad (\text{VRS})
\]

where \(F_k^t = \max \lambda\) is the FARREL measure of technical efficiency of firm \(k\), \(z_k\) are variables which show the intensity with which each farm is used to construct the best
practice frontier, \( y_{k,m} \) is the \( m \)-th output of \( k \)-th firm, \( x_{k,n} \) is the \( n \)-th input employed by firm \( k \), \( t \) is time and \( k = 1 \ldots K \) is the number of enterprises. Solutions to this optimization problem are obtained using the computer program OnFront2. \( F_k^t \) can range from 1 to infinity, with enterprises having an efficiency score of 1 being the most efficient. Values of \( F_k^t \) greater than 1 show by how much output could be expanded using the given set of inputs. According to COELLI’s (1998) definition of output-oriented technical efficiency, which is the inverse of the measure defined in (9.1), technical efficiency scores run from zero to one. In our paper we use COELLI’s definition.

Before proceeding, we mention a few qualifications to be made when interpreting technical efficiency. First, technical efficiency is a relative measure, that is, we consider an enterprise’s technical efficiency relative to other enterprises. If the sample is small enough and the enterprises are more or less homogeneous then it might appear that the majority of enterprises is efficient, even though from an economic point of view they are all together inefficient. Since \( F_k^t \) measures relative performance, it is very sensitive to outliers, and, hence, before starting the analysis a careful look at the data is required to exclude outliers from the sample.

Second, in the real world, the inputs used in production are rarely homogeneous across enterprises. This point is especially relevant for agricultural inputs such as land. To provide a complete and accurate picture of the real world, one should account for input heterogeneity. But heterogeneity, for example, in land reflects differences in climate, natural land fertility and other factors that are difficult to measure. For the sake of simplicity we make the strong assumption of input homogeneity. Third, \( F_k^t \) was initially developed for physical amounts of inputs and outputs. However, what one usually observes is aggregated output (e.g. revenue) and aggregated input (e.g. labor and material cost). Aggregation can result lead to a downward bias of DEA efficiency scores (FÄRE et al., 2002).

So far, our discussion has focused on technical efficiency. However, economists are also interested in measuring the ability of an enterprise to choose an optimal (revenue-maximizing) combination of outputs. This ability is referred to as allocative efficiency. The product of technical and allocative efficiency yields a measure of economic efficiency, which shows an enterprise’s ability to extract as much output as possible from a given set of inputs and to choose the optimal combination of outputs.

One of the objectives of this analysis is to compare the efficiencies of different enterprise forms in Ukraine. For this purpose we construct a Grand Frontier. The idea of this approach is represented in figure 9.1 for the one input-one output case and two kinds of ownership structures.
Let ABCD be the technology frontier for, say, state enterprises and RQFG the frontier for private enterprises. Technology set ABFG is constructed under the assumption of a common technology and is referred to as the Grand Frontier. Consider a state enterprise S. The distance SL measures technical inefficiency within the group of state enterprises. The distance from the state enterprise-specific frontier to the Grand frontier (LN) measures inefficiency attributed to ownership pattern and is referred to as ‘structural’ technical inefficiency. Next consider private enterprise P. Even though it is technically inefficient within the group of private enterprises, its structural technical efficiency equals 1. Thus, higher average values of structural technical efficiency for private enterprises, for instance, would indicate that they have an organisational advantage over state enterprises.

The technical efficiency measures discussed above lend themselves readily to productivity measurement. In fact they are the natural building blocks for measuring Total Factor Productivity (TFP) which lies at the heart of our discussion of regional patterns of agricultural development. TFP is the ratio of average productivities in certain time periods, that is:

\[ TFP = \frac{y_t^{t+1}}{y_t^t} / \frac{y_t^{t+1}}{x_t^{t+1}} \]

(9.2)

The input-oriented Malmquist Productivity Index \( (M_i) \) that we employ to measure TFP is calculated as follows:

\[ M_i(x_t^{t+1}, y_t^{t+1}, x_t^t, y_t^t) = \left( \frac{D_i^t(x_t^{t+1}, y_t^{t+1})}{D_i^t(x_t^t, y_t^t)} \cdot \frac{D_i^{t+1}(x_t^{t+1}, y_t^{t+1})}{D_i^{t+1}(x_t^t, y_t^t)} \right)^{1/2} \]

(9.3)
or, alternatively,

\[ M_1(x^{t+1}, y^{t+1}, x^t, y^t) = E(x^{t+1}, y^{t+1}, x^t, y^t) \cdot T(x^{t+1}, y^{t+1}, x^t, y^t), \] (9.4)

Where \( E(.) \) is a relative efficiency change index under constant returns to scale which measures the degree of catching up to the best-practice frontier for each observation between time \( t \) and \( t+1 \), and \( T(.) \) represents the technological change index which measures the shift in the frontier between two time periods (MAO & KOO, 1996).

3 Definition of variables and data description

3.1 Data resources for estimating technical, allocative and economic efficiencies

Farm level data are taken from the financial statements of agricultural enterprises for 2001 provided by Ministry of Agrarian Policy of Ukraine. The research covers 85% of the agricultural enterprises in 5 central oblasts: Vinnytsya, Kiev, Kirovograd, Cherkasy and Poltava. After ‘cleaning’ the data for missing and nonsensical observations and outliers, the sample produced 2658 observations: 529 private enterprises, 1651 agricultural companies, and 468 state farms and cooperatives. Since cooperatives are farms that took the easiest possible path when forced to restructure by Presidential Decree at the end of 1999, there is no real difference between state enterprises and cooperatives except for the formal name and we consider them as one group – cooperatives.

We use the following 10 outputs: (i) grains (dt), sunflower seeds (dt), sugar beet (dt), sales revenue from other crops (thd. UAH); (ii) beef (dt), pork (dt), milk (dt), sales revenue from other animal products (thd. UAH); and (iii) processed meat (dt) and sales revenue from other processed products (thd. UAH). To calculate economic efficiency as an aggregated output we use sales revenue. The potential problem with using sales revenue as an output variable is that output prices might vary systematically across different organisational forms. For example, state enterprises might receive inputs from the state but then be obliged to sell their produce to procurement organisations at below-market prices. Thus, given the same production of output in physical units state enterprises may appear less efficient because they receive lower output prices. We assume that output prices are equal for all enterprises, but note that this may bias our results.

In the analysis we use 7 inputs: seeds, forage, mineral fertilizers, energy, fuel and repairs, land and labour. Data on the cost of mineral fertilizers was transformed into tonnes of effective ingredient using information provided by the Ministry of Agrarian Policy on the average price of a tonne of effective ingredients in 2001 (1825 UAH/tonne). The cost of energy consumption was transformed into physical amounts using a price of energy of 18.8 kopeks per kW-hour. As labour input we use the average annual number of workers employed in the production process.

3.2 Data resources for measuring TFP

To measure TFP we use data on agricultural inputs and outputs for 25 oblasts between 1996 and 2000. This provides us with a panel of 125 observations. The aggregated oblast-level data include agricultural enterprises only (households and family farms are excluded).
The outputs and inputs used to measure TFP as well as efficiency and technological changes at the aggregate level are:

Labour – the number of workers employed in agricultural enterprises taken from the Statistical Yearbook of Ukraine in 2001.

Land – the area of agricultural land used by agricultural enterprises taken from information provided by the Ministry of Agrarian Policy on net profits of agricultural enterprises and profits per 100 has of agricultural land.

Machinery power – a proxy for capital input and measured in horse power provided by the Ministry of Agrarian Policy. Clearly, this variable does not take into account the age and condition of the machinery used. However, no other variables for capital stock are available.

Mineral Fertilizers – the total effective weight of fertilizers employed measured in thd. tonnes provided by the Ministry of Agrarian Policy.

Gross value of production by agricultural enterprises – the output measured in mUAH (in constant 1996 prices).

4 Farm efficiency: Empirical considerations

If there are significant differences in the average efficiencies of agricultural enterprises depending on their organisational form, we should estimate form-specific technologies rather than a common technology. Results obtained from estimating form-specific technologies cannot be used to compare efficiencies between organisational forms, but they do provide valuable insights into heterogeneity within each group. Thus, we begin by estimating the Cobb-Douglas production functions using a cross-section of 2658 observations. To allow for possible shifts in technology among different ownership forms as well as different production elasticities we introduce dummy variables for the intercept and interaction terms. Thus, we discriminate between private enterprises, agricultural enterprises and cooperatives. The econometric estimation results are presented in appendix table 9.1. As the hypothesis that intercepts and production elasticities are equal across groups can be rejected at the 1% significance level, the assumption of a common technology not tenable and we estimate efficiency scores for each form of ownership individually.

Kernel density functions that describe the distribution of the individual efficiencies are plotted in appendix figures 9.1 through 9.3. An interesting finding is that all distributions are bimodal in the sense that all types of enterprises have a relatively small cluster of highly efficient farms and a relatively large cluster of inefficient farms. Furthermore, agricultural companies appear to be the most heterogeneous category. Average efficiencies are reported in table 9.1 below.
Table 9.1: Average values of efficiencies

<table>
<thead>
<tr>
<th></th>
<th>Technical efficiency</th>
<th>Allocative efficiency</th>
<th>Economic efficiency</th>
<th>Structural efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private enterprises</td>
<td>0.87 (1.15) *</td>
<td>0.75 (1.33)</td>
<td>0.65 (1.54)</td>
<td>0.86 (1.16)</td>
</tr>
<tr>
<td>Agricultural companies</td>
<td>0.75 (1.33)</td>
<td>0.52 (1.92)</td>
<td>0.40 (2.50)</td>
<td>0.94 (1.06)</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>0.86 (1.16)</td>
<td>0.68 (1.47)</td>
<td>0.60 (1.67)</td>
<td>0.79 (1.27)</td>
</tr>
</tbody>
</table>

Note: * Following the discussion in section 2 using Coelli’s definition of output-oriented efficiency scores, the scores range from 0 to 1, with 1 indicating the most efficient enterprises. If one wants to find the amount by which output can be expanded given the data set one should find the inverse of the Coelli’s efficiency score. We provide these numbers in brackets.

Source: Own calculations.

The results indicate that the average technical efficiency of private enterprises equals 0.87. Hence, the average private enterprise could increase output by 15% by making the best possible use of its existing resources. Private enterprises appear to be less successful in optimally choosing output combinations than in extracting as large an output as possible from a given set of resources; if their production were to occur at the allocatively efficient point, their output would, on average, increase by 33%. Agricultural companies could on average expand production by 2.5 times without additional resources by just improving management and allocating outputs more efficiently. Thus, the results reveal that agricultural enterprises have large potentials to increase their output.

These results cannot, however, be used to compare efficiency across groups because the reference for the measurement of efficiency is different for the three groups. For this purpose we estimate structural technical efficiency, which to a great extent captures the effect of organisational form on enterprise’s performance.

It is well known that owner-managed firms, private firms, state firms and cooperatives are each associated with distinctive sets of incentives for efficiency. In private enterprises in most cases the manager is the owner and he has a strong incentive to keep a close eye on things. In enterprises where there are a few owners and management is separated from ownership, managers have incentives to satisfy their own objectives rather than use resources in the most efficient way. Thus, a priori we would expect private enterprises to be the most efficient. The average values of structural technical efficiency reported table 9.1 indicate that it is the greatest for agricultural companies. This suggests that agricultural companies have an advantage over private enterprises and cooperatives as an organisational form. At a first glance, this seems to contradict our expectations. A plausible explanation for this is that the most efficient agricultural companies (companies that form the frontier) are in essence private enterprises in all but name. For example, many agricultural companies have only two shareholders – husband and wife. Even though they are formally ‘partnerships’ they are actually family-managed and essentially private enterprises. At the same time, the number of shareholders substantially fluctuates (from 2 to 100) across agricultural companies, which explains the large heterogeneity of this category of farms.

Even though cooperatives are on average the least efficient enterprises, the most efficient cooperatives are just as good as the best private farms (table 9.2). Indeed, performance indicators appear to be higher for the best cooperatives than for the best private farms. Thus, enterprise’s performance is to a great extent a matter of management rather than organizational structure. Despite the structural shortcomings of cooperative ownership,
some managers clearly function well in a cooperative setting and manage to attain a great deal with their farms.

Table 9.2: Some characteristics of 15 the most efficient enterprises in each category

<table>
<thead>
<tr>
<th></th>
<th>Revenue per ha of land, thd. UAH</th>
<th>Revenue per worker, thd. UAH</th>
<th>Revenue per unit of capital, thd. UAH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private farms</td>
<td>1.82</td>
<td>0.12</td>
<td>3.37</td>
</tr>
<tr>
<td>Agricultural companies</td>
<td>2.34</td>
<td>0.14</td>
<td>4.19</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>2.30</td>
<td>0.17</td>
<td>4.47</td>
</tr>
</tbody>
</table>

Source: Own calculations.

Labour-intensive farms appear to be less technically efficient than otherwise identical farms employing more capital-intensive techniques (see appendix figure 9.4). We define capital-intensity as the ratio of capital services to workers. Furthermore, appendix figures 9.5 and 9.6 reveal that labour-intensive alternatives always use more labour and more capital per unit of output than processes with high capital-labour ratios. On agricultural cooperatives, for example, the capital-labour ratio is 33% higher for the most efficient farms than for the least efficient, while the returns to capital and labour are higher by 120 and 192%, respectively. Thus, by better equipping workers Ukrainian farms could significantly increase the productivity of both labour and capital.

The land reforms launched in 2000, the privatization of assets and laws regulating the restructuring of collective and state farms were intended to increase economic efficiency. A natural question arises: Was the agricultural reform of the year 2000 effective? Effective restructuring implies improved management of resources. Effective agricultural reform also implies price liberalization and, as a result, improvements in the functioning of input markets, which should inevitably lead to a better resource allocation. Combined, these two effects should have yielded improvements in economic efficiency on Ukrainian farms. Has this improvement occurred? Figure 9.2 presents kernel density functions that describe the distributions of economic efficiency scores in 1999 and 2002. Monetary values in 2002 were deflated using the corresponding deflators: total production costs were deflated with a weighted deflator\(^2\), sales revenue from other crop products was deflated using a price index for crop products, and sales revenue from other animal products using a price index for animal products. Enterprises in 1999 and 2002 were pooled and a common technology frontier was estimated. Thus, since efficiency in 1999 and 2002 is measured with respect to the same frontier, a shift in the distribution reflects both a change in economic efficiency and a possible shift of the best practice frontier between 1999 and 2002. The first column of panels in figure 9.2 was constructed for collective agricultural enterprises (CAEs) that were transformed into private enterprises, the middle column for CAEs that were transformed into agricultural companies, and the third column for cooperatives.

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\(^2\) To compare data and results from 1999 and 2002, monetary values in 2002 were deflated using corresponding deflators. Total production costs were deflated by a weighted deflator constructed using the cost structure for an average farm: wage bill – 20.4%, capital – 41.8% and intermediate inputs – 37.8%. As a wage deflator we employed agricultural wage index (1.74, 1999=1), capital deflator – Producer Price Index (1.288) and a deflator for intermediate inputs – Price Index for agricultural crops (1.327) Thus, the weighted deflator was calculated as follows: PI = 0.204*1.74 + 0.418*1.288 + 0.378*1.327 = 1.39.
into agricultural companies and the right-hand column for CAEs that were transformed into cooperatives.

* A priori, one would expect that restructuring would have shifted the efficiency distributions to the right. Moreover, for private enterprises the rightward shift of the distribution is expected to be larger than for CAEs that were transformed into agricultural companies and cooperatives. This is supported by the evidence in figure 9.2. In all zones but the Steppe, private enterprises experienced a rightward shift of the distribution, with private enterprises in the Polissya zone enjoying the largest rightward shift based on a test of the sample means. The shift in the efficiency distributions for CAEs that were transformed into agricultural companies is lower. Mean values of efficiency significantly increased for agricultural companies in the Polissya, Karpathian and Steppe zones, while in the Forest-steppe the shift was not significant. The efficiency distributions of CAEs that were transformed into cooperatives changed little in the Forest-steppe and Polissya zones; in the Steppe zone economic efficiency appears to have deteriorated, while in the Karpathian zone the proportion of efficient farms increased after the restructuring.

Thus, the results suggest that the transformation of CAEs into private enterprises yielded noticeable improvements in terms of economic efficiency and technical change (a shift of the technology frontier between 1999 and 2002). Transformation into agricultural companies has been less effective, while transformation into cooperatives characterized by a lack of effective restructuring, including both management reform and operation adjustments. While the first results presented above suggest that agricultural companies are the most efficient in a *static* sense (which may be because the CAEs that chose this organisational form were more efficient initially), private enterprises are the most efficient organizational structure in a *dynamic* sense, that is, they appear to adjust to the prevailing conditions and improve their efficiency and technology faster than the other types of enterprise.
Figure 9.2: The effect of restructuring on economic efficiency

Forest-steppe zone

Polissya zone

CAEs that were transformed into private enterprises

CAEs that were transformed into companies

CAEs that were transformed into cooperatives
Figure 9.2 (continued):  The effect of restructuring on economic efficiency

Steppe zone

Karpathian zone

CAEs that were transformed into private enterprises
CAEs that were transformed into companies
CAEs that were transformed into cooperatives

Source:  Own calculations.
To explain the differences in technical inefficiencies across farms we regress their efficiency scores on a number of explanatory variables using Tobit models truncated at zero and one. The explanatory variables are: farm size (ha), specialisation\(^1\), the ratio of fertilizer to land and the ratio of capital to labour. The results are reported in table 9.3 below; since we are primarily interested in the direction of the effects we report only coefficients and not marginal effects.

**Table 9.3: Tobit estimation of the impact of various factors on technical efficiency**

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Estimated coefficient (standard error)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.691 (0.022)</td>
<td>0.00</td>
</tr>
<tr>
<td>HI</td>
<td>0.151 (0.041)</td>
<td>0.00</td>
</tr>
<tr>
<td>Fertilizers/land</td>
<td>0.422 (0.142)</td>
<td>0.00</td>
</tr>
<tr>
<td>Farm size</td>
<td>-0.003 (0.001)</td>
<td>0.00</td>
</tr>
<tr>
<td>Capital/labour</td>
<td>0.023 (0.022)</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Source: Own calculations.

The effect of farm size is found to be significant and negative. Thus, small farms are on average more technically efficient than large ones. Specialization also has a positive impact on technical efficiency: enterprises that concentrate on fewer activities are more technically efficient than others. Fertilizing land also has a significant positive effect on efficiency and the magnitude of this effect exceed that of all other variables.

### 5 Total factor productivity change in Ukrainian agriculture

We first present the results of the aggregated analysis using data on agricultural inputs and outputs for all of the 25 regions in Ukraine between 1996 and 2000. Over this period, Ukrainian agriculture experienced a decline in output of about 30%. This decline might have been due to a reduction in input use, as enterprises responded to increasing input prices. As can be seen in figure 9.3, labour employed by agricultural enterprises and capital input were decreasing throughout 1996-2002. Agricultural production changes cannot, however, be explained without also considering efficiency and technological change over the period.

* A priori we formulate the following hypotheses: (i) as the number of private enterprises increased each year, technical efficiency is expected to have increased, since private ownership creates incentives for the efficient use of resources; and (ii) technological changes were only of minor importance, for no major innovations occurred over this period.

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\(^1\) Specialisation is measured using the Herfindahl index \(HI = \sum s_i^2\), where \(s_i\) is the share of the \(i\)-th activity in an enterprise’s total activities. The larger \(HI\), the greater the degree of specialization.
To test these hypotheses, Malmquist TFP indices were calculated for each period. Average annual changes in TFP are reported in appendix table 9.2. The results reveal that productivity grew by only 0.7% per year on average, with technological change contributing 2.1% to this growth and efficiency change contributing -1.3%. The decomposition of technical efficiency change shows that no improvements occurred in either pure technical efficiency or scale efficiency. Hence, the modest annual increase in TFP in Ukrainian agriculture is due to technological innovation rather than improvements in technical efficiency.

Of the 25 regions studied the performance of L’viv, Rivne and Ternopil oblasts was the poorest with TFP declining annually by an average 8.6%. The decomposition of TFP into technological change and technical efficiency reveals the sources of decline in productivity. In total, thirteen regions experienced a fall in technical efficiency. The highest increase in technical efficiency occurred in Zaporizhya oblast, meanwhile Kirovograd enjoyed the highest growth in technology.

Table 9.4 below reports mean annual changes in TFP and its components. In 1997, growth in TFP was composed of an efficiency change of 7.7% combined with deterioration in technology of 7.4%. Figure 9.3 illustrates that the decline in output was the greatest in 1998 over the five-year period. In table 9.4 we see that in this year efficiency decreased dramatically by about 20%, and that technological improvement of 2% only partially offset this decrease. The fact is that fertilizer use fell dramatically in this year. Thus, the reduction in efficiency is likely to have been due to decreased productivity. The year 2000 is characterised by high technological progress (20.5%); technical efficiency, however, declined by roughly 2%. One explanation for the technological progress in 2000 might be...
the increase in output prices at the beginning of 2000, which enabled enterprises to earn more profits and invest in new technology.

Table 9.4: Annual changes in efficiency across all Ukrainian oblasts

<table>
<thead>
<tr>
<th>From year t to year t+1</th>
<th>Malmquist index</th>
<th>Efficiency change</th>
<th>Technological change</th>
<th>Pure efficiency change</th>
<th>Scale efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-1997</td>
<td>0.998</td>
<td>1.077</td>
<td>0.926</td>
<td>1.038</td>
<td>1.037</td>
</tr>
<tr>
<td>1997-1998</td>
<td>0.821</td>
<td>0.805</td>
<td>1.020</td>
<td>0.872</td>
<td>0.923</td>
</tr>
<tr>
<td>1998-1999</td>
<td>1.062</td>
<td>1.115</td>
<td>0.952</td>
<td>1.074</td>
<td>1.039</td>
</tr>
<tr>
<td>1999-2000</td>
<td>1.184</td>
<td>0.982</td>
<td>1.205</td>
<td>0.987</td>
<td>0.995</td>
</tr>
</tbody>
</table>

Source: Own calculations.

Since the Malmquist index and its components are multiplicative we can calculate cumulated effects over the entire period (appendix table 9.3). Over the whole period TFP increased by 6%. This increase was due to technological progress (9.2%) moderated by a reduction in technical efficiency due to a fall in both pure technical efficiency (-2.8%) and scale efficiency (-0.9%). L’viv experienced the largest decline in productivity (-30.5%) and technology (-6.6%), while Kirovograd showed the highest growth in productivity (61.6%) and technology (39.7%). The last column of appendix table 9.3 contains data on average farm size in each of the 25 oblasts. The distinctive feature is that the oblasts in which agricultural enterprises are relatively small display the poorest performance. For example, the average size of an agricultural enterprise in the Western oblasts that rank the last in terms of TFP growth is about 565 hectares, while that of the enterprises in the South-Eastern oblasts (Kirovograd, Kherson, Mykolaiv, Zaporizhya) that experienced the highest growth in TFP is roughly 2000 hectares. This finding supports large-scale production and it appears that the benefits of size such as easier access to credit and modern technology and more efficient utilization of resources due to economies of scale outweigh the transaction costs that increase with farm size. This contradicts the claim made by some researchers that in transition countries small farms are more technically efficient and experience higher productivity growth than large farms.

Summarizing, in general average annual growth in agricultural productivity was only modest and was primarily attributed to technological improvements. Technical efficiency as well as its components declined from year to year. These findings contradict our a priori expectations, but they are consistent with other studies (see Mao & Koo, 1996).

6 Conclusions and policy implications

In this paper we measure productivity changes and provide a comprehensive analysis of the factors determining the observed development paths in Ukrainian agriculture. The Malmquist index, a measure of TFP based on DEA analysis, was used for this purpose. The results obtained from this study have important implications for Ukrainian agriculture.

First, half of the oblasts in Ukraine experienced a decline in TFP between 1996 and 2000, which was primarily due to a decline in technical efficiency. This indicates that Ukraine has a great potential to increase its agricultural output through improving technical efficiency. Six Western oblasts (L’viv, Ternopil, Rivne, Ivano-Frankivsk, Chernivtsi and Transkarpathian) experienced technological regress over the entire period. This implies that these are low-technology regions and for agricultural production to be fostered they require
increased investments in modern technology. Generally, if technological change is largely a question of catching up, then one would expect that improving technology is closely related to foreign direct investment as a means of transferring innovations and know-how from other countries to Ukraine. However, foreign technologies cannot be adopted one to one, but rather must be adapted to Ukrainian conditions. So, the government could contribute by increasing investment in research and education. Investments especially in education could help to ensure that managers make the best possible use of the available technology and capital stock.

Second, TFP growth is positively related to farm size. Large agricultural enterprises appear to experience greater improvements in technical efficiency and technological progress. This finding runs counter to other in the literature and suggests that there is no justification for a pro-small farm bias in agricultural policy in Ukraine.

Technical, allocative and economic efficiencies of Ukrainian farms have also been estimated. The results reveal that farms have a great potential to expand output by simply improving management and choosing more efficient output combinations. Furthermore, farms of all forms of ownership appear to succeed more in using resources efficiently than in allocating outputs. In this respect a few policy recommendations may be warranted. First, a more competitive environment in output markets should be created, since competitive markets are the most flexible and efficient mechanism for allocating resources. Second, market information systems should be developed. This would help farmers predict market conditions and adjust their output mixes accordingly, which would increase average allocative efficiency.

Of the three forms of ownership, agricultural companies are found to be most efficient. This, however, may be due to the fact that the most efficient agricultural companies are effectively operating as private farms. Nevertheless, the best cooperatives perform as well as private farms, which implies that what matters most is management and not organizational structure. Agricultural companies are the most heterogeneous category, which is explained by the large variation in the number of owners among agricultural companies.

Technical efficiency is positively related to an enterprise’s capital intensity. Farms have a huge potential to expand their output by better equipping workers. On the policy side, this requires facilitation of farmers’ access to public services and capital markets. Furthermore, farm size and specialization have positive and significant impacts on technical efficiency.

A final important point is that our analysis at the farm level considers agricultural enterprises in five central Ukrainian oblasts. In Western and Eastern oblasts, climatic and soil conditions are different. Therefore, while our inferences about the efficiency of enterprises in Central Ukraine are valid, they cannot necessarily be extended to the country as a whole.

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2 See Chapter 11 on *Farm Management Challenges in Ukrainian Agriculture* for a further discussion.
7 References


Appendix

Appendix Table 9.1: Estimation of production function (dependent variable – sales revenue)

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Private enterprises</th>
<th>Agricultural companies</th>
<th>Cooperatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant a_11</td>
<td>1.36 (0.32)</td>
<td>a_21 1.40 (0.19)</td>
<td>a_31 0.92 (0.34)</td>
</tr>
<tr>
<td>Seeds b_11</td>
<td>0.13 (0.04)</td>
<td>b_21 0.04 (0.02)</td>
<td>b_31 0.07 (0.06)</td>
</tr>
<tr>
<td>Forage b_12</td>
<td>0.01 (0.02)</td>
<td>b_22 0.04 (0.01)</td>
<td>b_32 0.04 (0.03)</td>
</tr>
<tr>
<td>Fertilizers b_13</td>
<td>0.05 (0.01)</td>
<td>b_23 0.09 (0.01)</td>
<td>b_33 0.09 (0.01)</td>
</tr>
<tr>
<td>Energy b_14</td>
<td>0.11 (0.03)</td>
<td>b_24 0.10 (0.02)</td>
<td>b_34 0.05 (0.03)</td>
</tr>
<tr>
<td>Fuel and repairs b_15</td>
<td>0.39 (0.06)</td>
<td>b_25 0.42 (0.03)</td>
<td>b_35 0.40 (0.07)</td>
</tr>
<tr>
<td>Land b_16</td>
<td>0.00 (0.06)</td>
<td>b_26 0.02 (0.03)</td>
<td>b_36 0.07 (0.08)</td>
</tr>
<tr>
<td>Labour b_17</td>
<td>0.29 (0.05)</td>
<td>b_27 0.27 (0.03)</td>
<td>b_37 0.38 (0.08)</td>
</tr>
</tbody>
</table>

H_0: a_11=a_21, b_11=b_21, b_12=b_22, b_13=b_23, b_14=b_24, b_15=b_25, b_16=b_26, b_17=b_27

H_0: a_11=a_31, b_11=b_31, b_12=b_32, b_13=b_33, b_14=b_34, b_15=b_35, b_16=b_36, b_17=b_37

H_0: a_31=a_21, b_31=b_21, b_32=b_22, b_33=b_23, b_34=b_24, b_35=b_25, b_36=b_26, b_37=b_27

0.01 (p-value)

0.00 (p-value)

0.00 (p-value)

Note: All variables are in logarithms; standard errors are in parentheses.

Source: Own calculations.

Appendix Figure 9.1: Kernel density of efficiency scores for private enterprises

Appendix Figure 9.2: Kernel density of efficiency scores for agricultural companies
Appendix Figure 9.3: Kernel density of efficiency scores for cooperatives

Appendix Figure 9.4: Capital intensity for different efficiency categories

Appendix Figure 9.5: Returns to capital

Appendix Figure 9.6: Returns to labour
### Appendix Table 9.2: Average annual change in Total Factor Productivity and its components

<table>
<thead>
<tr>
<th>Region</th>
<th>Malmquist index</th>
<th>Efficiency change</th>
<th>Technical change</th>
<th>Pure efficiency change</th>
<th>Scale change</th>
</tr>
</thead>
<tbody>
<tr>
<td>L'viv</td>
<td>0.914</td>
<td>0.930</td>
<td>0.983</td>
<td>0.933</td>
<td>0.996</td>
</tr>
<tr>
<td>Rivne</td>
<td>0.914</td>
<td>0.927</td>
<td>0.987</td>
<td>0.932</td>
<td>0.995</td>
</tr>
<tr>
<td>Ternopil</td>
<td>0.914</td>
<td>0.920</td>
<td>0.993</td>
<td>0.921</td>
<td>0.999</td>
</tr>
<tr>
<td>Khmelnytskiy</td>
<td>0.925</td>
<td>0.925</td>
<td>1.000</td>
<td>0.931</td>
<td>0.994</td>
</tr>
<tr>
<td>Ivano-Frankivsk</td>
<td>0.938</td>
<td>0.951</td>
<td>0.986</td>
<td>0.984</td>
<td>0.966</td>
</tr>
<tr>
<td>Chernivtsi</td>
<td>0.961</td>
<td>0.965</td>
<td>0.996</td>
<td>0.988</td>
<td>0.977</td>
</tr>
<tr>
<td>Vinnytsya</td>
<td>0.977</td>
<td>0.947</td>
<td>1.032</td>
<td>0.990</td>
<td>0.956</td>
</tr>
<tr>
<td>Sumy</td>
<td>0.983</td>
<td>0.965</td>
<td>1.019</td>
<td>0.955</td>
<td>1.011</td>
</tr>
<tr>
<td>Volyn</td>
<td>0.986</td>
<td>0.948</td>
<td>1.040</td>
<td>0.924</td>
<td>1.026</td>
</tr>
<tr>
<td>Transkarpathian</td>
<td>0.988</td>
<td>1.008</td>
<td>0.981</td>
<td>1.000</td>
<td>1.008</td>
</tr>
<tr>
<td>Zhytomyr</td>
<td>0.990</td>
<td>0.972</td>
<td>1.019</td>
<td>0.973</td>
<td>0.999</td>
</tr>
<tr>
<td>Kiev</td>
<td>0.999</td>
<td>1.000</td>
<td>0.999</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Cherkasy</td>
<td>1.001</td>
<td>0.981</td>
<td>1.021</td>
<td>0.983</td>
<td>0.998</td>
</tr>
<tr>
<td>Poltava</td>
<td>1.002</td>
<td>1.000</td>
<td>1.002</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Chernivtsi</td>
<td>1.010</td>
<td>0.972</td>
<td>1.040</td>
<td>0.974</td>
<td>0.998</td>
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Source: Own calculations.
10 The Balanced Scorecard as a New Strategic Management Instrument for Ukrainian Agricultural Enterprises

ALEXEJ LISSITSA

1 Introduction

Several empirical studies that analyse agricultural developments in Ukraine highlight the drastic reduction in productivity in the sector since independence in 1991 (KÖESTER 1999; LISSITSA 2002; CSAKI et al., 2002; GALUSHKO et al., 2003). The primary cause of this reduction in productivity is declining efficiency. Interestingly, research indicates that efficiency is positively related to farm size in Ukraine, although heterogeneity is significant and the differences between more and less successful large farms have grown. Similar results have also been observed in Russia (STANGE & LISSITSA, 2003). These findings are partly supported by the current trends particularly in Russia – but also in Ukraine – to establish so-called agriholdings or vertically structured agro-industrial corporations with tens of thousands hectares of land and hundreds of employees. Comparable tendencies are observed not only in transition countries but also in the USA and Australia (PLUMMER & ROLFE, 2002; MILLER et al., 1998; BOEHLJE, 2003 & 2004).

The explanations for the greater efficiency of large farms include, inter alia: ability to make better use of new technologies in agriculture; advantages on credit markets and in risk diffusion; and many central management aspects such as personnel and strategic management which have been and are still ignored on small farms, but which can successful implemented on large farms. Especially strategic management can play a noteworthy role in efficiency improvements in agribusiness (BOEHLJE, 2003). With continued emergence of agro-industrial corporations in Ukraine and Russia, the importance of clear management strategies will grow.

Strategic decisions are associated with such things as an enterprise’s product mix, its marketing linkages and its financial structure. For example, the use of contract production increases the importance of carefully selecting partners, since payments for products will depend on the financial situation of the partner rather than the market. Agricultural enterprises in Ukraine could increase their efficiency in the long run if they were better able to choose appropriate strategies and organise their structures and operations to these strategies.

In this paper a strategic management tool called the Balanced Scorecard is presented. Experience with and the first results of the implementation of this tool in Agro-Soyuz, a Ukrainian closed joint-stock agricultural enterprise, are outlined and discussed.

2 The Balanced Scorecard approach

The Balanced Scorecard (BSC) was first introduced in the early 1990s through the work of ROBERT KAPLAN & DAVID NORTON of the Harvard Business School (KAPLAN & NORTON, 1992). Since then, the concept has become well known and its various forms widely adopted around the world. Recognising some of the weaknesses and vagueness of previous management approaches, the balanced scorecard approach provides a clear
prescription of what companies should measure in order to 'balance' the financial perspective. The original concept of the BSC was based on the assumption that the efficient use of investment capital is no longer the sole determinant of competitive advantage. Instead, flexible factors such as intellectual capital, knowledge creation or excellent customer orientation have become increasingly important. As a reaction, KAPLAN & NORTON suggested a new performance measurement approach that focuses on four perspectives of corporate strategy. The BSC aims to make the contribution and the transformation of soft factors and intangible assets into long-term financial success explicit and thus controllable. The four perspectives of original BSC can be briefly described as follow:

- The **financial perspective** indicates whether a strategy leads to improved economic success. Typical financial goals are profitability, growth and shareholder value. Relevant measures in agricultural sector may include return on investments, sales growth, operating income etc.

- The **customer perspective** asks the question "How do existing and new customers view and value us?" This perspective may not feature prominently in many farm business plans, yet it could be a key question to address to ensure that a farm business becomes a preferred supplier to its customer(s). The development of quality assurance systems on-farm would be a strategy aimed at improving the supplier-customer relationship. Similarly, the development of some contractual arrangements and strategic alliances also addresses this perspective by exploring how a farm can develop and improve its relationships with customers.

- The **internal business perspective** asks the question “What must we excel at?” It focuses on the skills, competence and technology that matter in a particular business, and an enterprise’s ability to meet the needs of its customers and its potential to add value to customers’ businesses. This area is generally adequately covered in many farm business plans. It covers the farm’s ability to deliver and produce to specification, thus concentrating on the production process (e.g. feed production for livestock, crop production, staffing etc.).

- Finally, the **learning and growth perspective** describes the infrastructure that is necessary for the achievement of the objectives of the other three perspectives. It covers an enterprise’s ability to change, improve and adapt its products and processes, as well as the ability to develop and introduce new improved products and services (KAPLAN & NORTON 1992). The importance of including goals that fall under this heading in a farm’s business plan cannot be overemphasised. The goals in this area are non-financial and aimed at ensuring that an enterprise’s greatest assets, its people, are being developed and nurtured to deliver the innovations that are crucial to success. This is an area that does not always have the prominence it deserves in farm business plans.

A core element of the BSC approach is the “linking together of the measures of the four areas in a causal chain which passes through all four perspectives” (NORREKLIT, 2000, p.67). The causal relationship chain is assumed to commence at the learning and growth perspective and flow upwards through the internal business perspective to the customer perspective and finally to the financial perspective (KAPLAN & NORTON, 1996). The performance measures in one perspective become the drivers of the measures in the next perspective in this chain (NORREKLIT, 2000). A good BSC should have a mix of core
outcome measures (lag indicators) and performance drivers (leading indicators) (KAPLAN & NORTON, 1996a).

Lag indicators and long-term strategic objectives are formulated for strategic core issues for each perspective based on an enterprise’s strategy. Lag indicators signal whether the strategic objectives in each perspective have been achieved. In contrast to lag indicators, leading indicators tend to be very firm-specific. They express the specific competitive advantages of an enterprise (e.g. farm) and establish how the results reflected in the lag indicators should be reached. Based on an enterprise’s specific strategy, the key performance drivers that have the greatest influence on the achievement of the core strategic objectives (measured by lag indicators) are identified for each perspective. The combination of the indicators in the four perspectives is achieved by defining goals and appropriate lag and leading indicators (KAPLAN & NORTON, 1996a). In this way, a BSC translates strategy into objectives, measures and targets in the four perspectives. Rather than representing strategy as a loose collection of indicators and measures, these are linked by cause and effect relationships. By formulating and defining the strategic targets and measures down to the financial perspective through the other perspectives, it becomes clear which influence factors have the greatest impact on the lag indicators and, thus, ultimately an enterprise’s success. These strategy-specific influence patterns are mirrored through cause-effect chains which directly or indirectly link all the targets, indicators, and measures of the BSC perspectives hierarchically towards the financial perspective with its long-term financial goals.

It is significant that the causal linking of leading and lag indicators not only occurs within individual perspectives, but also by constructing effect chains through the four perspectives of the BSC. This means that lag indicators of lower-level BSC perspectives act as leading indicators or performance drivers for indicators at higher-level perspectives. Proceeding in this way results in a situation in which the lag (financial) indicators are combined with the leading indicators/performance drivers through the four perspectives leading to a hierarchical cause-effect network which reflects the fundamental assumptions for successful translation of the strategy (KAPLAN & NORTON, 1996a, 2001, 2004). This strategy-focused hierarchical approach ensures the identification of the major strategic issues of a farm business and assigns them their particular strategic relevance – as strategic core issue or performance drivers. This enables an orientation of all business resources and activities towards the implementation and communication of the strategy.

To date, thousands of firms around the world have implemented the BSC, and there are many case studies describing the BSC as an effective method of strategic management. The most famous examples of the successful use of the BSC approach are firms such as Mobil, British Airways and Volvo (KAPLAN & NORTON, 2001, 2004; OLVE et al., 2001). In the agri-food sector the following companies have successful implemented the BSC: Nordzucker in Germany (DEPPE-LEIKEL, 2003); agricultural grain marketing cooperatives in Australia (PLUMMER & ROLFE, 2002), Zeneca Ag Products in the USA (KAPLAN & NORTON, 2001), and Farm Credit Canada1.

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1 Farm Credit Canada is a federal Crown Corporation, reporting to Parliament through the Minister of Agriculture and Agri-Food (see http://www.fcc-fac.ca)
However, the BSC is by far not an easy-to-develop management accounting tool. A number of authors and even the originators of the concept have pointed out that successful implementation in specific, real settings requires significant adaptations and modifications. Frequently repeated points of criticism include the following (Norreklit, 2000; Noell & Lund, 2002):

- The assumption of cause-effect relationships across the four major perspectives is problematic. Often the links between the performance variables are ambivalent (e.g. the relation between customer satisfaction and financial success), merely statistical (covariance, but no clear causality), purely logical (e.g. relationships developed from neoclassical reasoning) or simply nonexistent.

- The assumption of a hierarchical relationship among the four major perspectives is also questioned. For example, management development might lead to increased profits, but sufficient profits are needed to finance management development. Thus, interdependence rather than unidirectional relationships among the measurement variables may be the appropriate characterization.

This list could be continued. For a comprehensive discussion of the strengths and weaknesses of the BSC approach, see among others Olve et al. (2001). Nevertheless it should also be mentioned that some criticism of the approach is misleading. First, the performance and scope of the original BSC concept are often overtaxed. Second, it is sometimes forgotten that any application of the BSC to a real enterprise is part of a comprehensive and repeated process of strategy development, implementation and control (Noell & Lund, 2002). The BSC, like any major change, must be constantly nurtured for a significant period before it takes root in an enterprise’s culture and ongoing management practices.

As mentioned above, there only few examples of BSC implementation in the agri-food sector. This could be due to the fact that agriculture in most industrialised countries is primarily based on family businesses. However, even though the literature on BSCs focuses on the corporate sector, this does not preclude its application to agriculture. Furthermore, due to the increasing complexity of the business of farming that is resulting from increasing farm sizes and the specialisation of production, the need for strategic management at the farm level is increasing. This has led in recent years to an increased interest in the BSB approach on the part of agricultural economists, managers and consultants (Plummer & Rolfe, 2002; Noell & Lund, 2002; Fritz, 2003; Pietrzak, 2003; Hernández et al., 2003, 2004). However, these applications mostly deal with the theoretical possibilities of applying the BSC approach in the agri-food sector. In this paper we present a case study of BSC implementation in Ukraine.

### 3 The Balanced Scorecard in the closed join-stock company *Agro-Soyuz*

As mentioned above, the heterogeneity of the efficiency of production on large farms in Ukraine has grown considerably in the course of transition. Some farms have survived the transition process relatively successfully, although not to the extent expected by many. The closed joint-stock company *Agro-Soyuz* used the reserves initially at its disposal for structural adjustments in the first transition phase to establish itself as an agribusiness enterprise. The agricultural primary production division of *Agro-Soyuz*, located in the
village Mayskoe, was established on the basis of the former collective agricultural enterprise (kolkhoz) ‘Drushba’ in 1997. In contrast to most Ukrainian agricultural enterprises, which still concentrate on surviving through low-intensity agricultural production, Agro-Soyuz has consequently searched for new technologies and management strategies in order to increase efficiency.

The managers of Agro-Soyuz knew that they needed to transform the way in which they strategically thought about, measured, and managed their business. After considerable research and also as a result of participation in the EFQM management quality network, they decided that using a Balanced Scorecard approach would be the best way to develop and implement their enterprise’s strategy. However, this belief was not founded on experience with the BSC approach in other agricultural enterprises in transition countries. This lack of experience made the implementation process more difficult than initially assumed.

A BSC project team, comprised of members from key areas of the enterprise, worked with consultants to develop a customised BSC for the company to translate its business strategy into specific strategic objectives. Agro-Soyuz’s mission has been formulated as combining “a constructive influence on society with the satisfaction of the intellectual and material needs of its own personnel and partners using implementation and distribution of innovations in production, agriculture and service”. Essentially, a BSC strategy map provided the management team with a high-level depiction of what needs to be done if the corporation is to live up to this mission. The strategy map achieved this by tracing the cause and effect relationships between the various strategic objectives contained within the scorecard segments. In contrast to Kaplan & Norton’s approach, Agro-Soyuz found it more appropriate to consider six company-specific perspectives instead of the four traditional perspectives: financial; customer; internal business; learning and growth or human resources; innovations; and society. The formulation of the two additional perspectives ‘innovations’ and ‘society’ was connected with Agro-Soyuz’s specific objective of being the most innovative agricultural enterprises in the country. It was also related to the fact that agricultural enterprises traditionally play an important role in rural development in Ukraine and are expected to provide a variety of services under the heading ‘social sphere’ (Lisitsitsa, 2002; Biesold, 2004). With formulation of the ‘society’ perspective, Agro-Soyuz underlined its commitment to contributing to the positive development of the sector and country as a whole using new technologies.

Monthly management meetings were organised according to the six BSC perspectives. At these meetings the managers discuss written summaries of what has happened during the last period, and the progress of each measure is discussed.

The first results of the implementation of the BSC approach in Agro-Soyuz are:

- A balanced and more efficient use of available resources.
- The introducing of a new monitoring and measurement system which helps to control and to manage the achievement or objectives.
- The simplification of management and organisation systems in the enterprises; and,

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2 For more information see www.efqm.org.
• A situation in which every employee understands his/her role in achieving business success.

• Significant insights gained by implementing the BSC approach in Agro-Soyuz include:
  
  • The BSC is used to communicate strategic objectives to employees, not to order them what to do. Everyone understands the enterprise’s strategy and helps to achieve its strategic objectives.

  • The BSC is a strategic management tool that could not be adopted one-to-one in the classical form proposed by Kaplan & Norton. Rather it could be adjusted to the specific conditions in agriculture in transition countries such as Ukraine; and,

  • The BSC management process is a continuous process. It is not directly concerned with an enterprise’s specific mission, but rather with its internal processes and external outcomes. This process is based on performance metrics that are tracked continuously over time to identify trends, best and worst practices, and areas for improvement. It delivers information to managers that can help to guide their decisions.

4 Conclusions and perspectives for the BSC approach in Ukrainian agriculture

The BSC is essentially a ‘network’ of linked indicators that articulates an enterprise’s strategy around a set of cause-effect relationships. A well-built scorecard reflects the intrinsic connections between each aspect of the strategy and each of the measures chosen to assess it. Also, the BSC has the advantage that it provides managers with both leading indicators and lag indicators about their companies. Hence the term Balanced Scorecard: it balances and links financial and non-financial indicators, tangible and intangible measures, internal and external aspects, performance drivers and outcomes.

The successful development of agricultural enterprises plays a significant role in the economic and social stability of rural areas in Ukraine. The combination of financial and non-financial indicators in BSCs allows agricultural companies to develop enterprise-specific strategies that are adjusted to the business environment in Ukrainian agriculture. The implementing of the BSC approach can help farms to develop, implement and monitor their restructuring strategies. It can also help to increase efficiency, allowing farm enterprises to contribute to the positive development of rural areas.

However, the following points should be considered when implementing the BSC approach in Ukrainian agriculture:

• The BSC approach can help an enterprise to implement its strategy, but is not designed to create such strategies. This is the task of the management team. Successful BSC implementation is impossible without a well-defined strategy.

• Many managers in Ukraine will believe that they can reap the benefits of the BSC by using a wide range of non-financial measures. However, care should be taken to identify not only lag measures that describe past performance, but also leading measures that can be used to plan future performance.
• Farm accounting practices should be adapted to the needs of strategic management and the BSC.

• It is usually not sufficient simply to copy the measurement system used by other successful firms. Each agricultural company should make the effort to identify the measures that are appropriate for its own strategy and competitive position; and,

• The first steps in implementing the BSC approach should be done with a help of a consulting firm or research institution.

The implementation of the BSC approach in many countries has demonstrated that competent advisory service is required. Consultants in existing agriculture advisory services in Ukraine do not have the necessary competence and methods to provide farmers with feedback on their strategies and to help them test the assumptions and expectations that their strategy is based on. Another point is that many agricultural enterprises in Ukraine feel that they are not able to pay for consulting services. Summarising, the BSC approach can be adjusted to the special business environment in Ukrainian agriculture and broadened to incorporate a number of factors that go beyond the purely financial.

Acknowledgment

The author is grateful to the closed joint-stock company Agro-Soyuz for the assignment of the data and for helpful suggestions.

5 References


11 Farm Management Challenges in Ukrainian Agriculture

GOTTFRIED LISCHKA

1 Introduction

Ukraine has some of the most fertile agricultural land resources in the world. This land is famous worldwide and the foundation of Ukraine’s reputation as Europe’s breadbasket. However, almost seventy years of Communist rule as well as the ensuing years of transition to a modern, market economy have left their marks on Ukraine not only in a material sense, but also in the minds of a population that was previously subjected to decades of oppression. Ukrainian agriculture suffered together with other sectors and activities, of course, and continues to suffer from this legacy today.

This chapter focuses on the situation in agriculture and especially crop production in Ukraine. On the one hand, it describes the economic situation of the production of grain, oilseeds and sugar beets as defining agricultural activities in Ukraine. At the same time, it discusses the challenges facing farmers and agricultural entrepreneurs in Ukraine, challenges that are arising in an increasingly globalised world of exchange in goods, services and information.

This chapter is based on information and impressions gathered by the author during a series of short-term consultancies in the years 2001-2004. The aim of these consultancies was to provide members of the DUAP (German-Ukrainian Agricultural Project) team in Ukraine with advanced training in farm management skills. In the process, the author was able to visit a number of farms on a regular basis. Together with the farm extension specialists working for the private consulting firm AKT Vinnytsya – a firm that emerged out of the DUAP project in 2002 – it was possible to acquire detailed knowledge of agriculture in that region.

2 Initial conditions

The situation of agriculture in Ukraine is characterized by the following factors:

- Increasing incidence of abandonment and insolvency of farm enterprises.
- Insufficient motivation of those employed in agriculture.
- A difficult legal environment (corruption, frequent breach of contract and legal insecurity).
- Declining yields since Soviet times and soils that have been depleted of organic matter and basic nutrients.
- An increasing proportion of fields are either fallow or weed-infested.
- Insufficient technical equipment at all stages of the production chain.
- Insufficient use of biological and technical innovations; and;
- Insufficient use of available information in all the areas of production, marketing, procurement, organization and economic management.
This in many regards sobering depiction of the current situation in Ukrainian agriculture will be studied in greater detail on the basis of economic calculations in the following sections. These calculations are, in turn, based on data collected by the author with the intensive and valuable support of the team of extension specialists working for AKT Vinnytsya.

3 The economic situation in crop production in the forest-steppe zone

Intensive calculations made by the author in the course of training missions for agricultural extension specialists in Ukraine between 2001 and 2004 generated data and insights into agricultural enterprises in the country. In-depth analyses of farm operations made it possible for Ukrainian and German extension specialists to draw conclusions regarding the economic situation of farm enterprises as well as the competitiveness of grain, oilseed and sugar beet production in the so-called forest-steppe zone. The forest-steppe zone is regarded as the most productive agricultural region in Ukraine. It extends in a broad belt from southwest to southeast of Kiev and includes most of the oblasts Cherkasy, Vinnytsya and Khmelnytskyi, as well as parts of the oblasts Ternopil and Zhytomyr. The high productivity in this region is due to uniform good soils combined with relatively advantageous climatic conditions (the volume and seasonal distribution of precipitation and low rates of evaporation) in comparison to most other parts of Ukraine. The relative proximity to Kiev is also an advantage.

According to our analysis, crop production in the region can be categorized into four distinct levels of intensity.

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<th>Enterprises of highly questionable viability</th>
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<td>Own production of seed in the second and third generation, no adherence to crop rotation, insufficient management of crop and livestock residues, no applications of lime.</td>
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<tr>
<td>3</td>
<td>Soil pH-value less than 5.5, soil organic matter &lt;2%, soil water balance and aeration poor.</td>
</tr>
<tr>
<td>4</td>
<td>&lt;20 kg/ha nitrogen, &lt;10 kg/ha phosphorus and 0 kg/ha potassium, only sporadic use of pesticides and herbicides. Yields: 25 dt/ha wheat, 150 dt/ha sugar beet, 2000 kg of milk per cow and year.</td>
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In contrast to the emerging situation in the Russian Federation, where it is estimated (and openly admitted) that roughly 30% of the farm enterprises are in danger of bankruptcy, it remains politically inopportune to label similar farms in Ukraine as unviable. We estimate that up to one half of all the farm enterprises in Ukraine can be classified as belonging to Level I and that these farms are severely threatened.
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<tr>
<td>2</td>
<td>Own production of seed in the first and second generation. Crop rotations planned but not always implemented. Attempts to manage crop and livestock residues, insufficient applications of lime.</td>
</tr>
<tr>
<td>3</td>
<td>Soil pH-value &gt;5.6, soil organic matter &gt;2.5%, soil water balance and aeration still insufficient.</td>
</tr>
<tr>
<td>4</td>
<td>&gt;40 kg/ha nitrogen, &lt;20 kg/ha phosphorus, &lt;10 kg/ha potassium, insufficient applications of pesticides and herbicides. Yields: 30 dt/ha wheat, 250 dt/ha sugar beet, &gt;2500 kg of milk per cow and year.</td>
</tr>
</tbody>
</table>

According to experience and the estimates of the extension specialists working with *AKT Vinnytsya*, roughly 40% of the agricultural enterprises in Ukraine can be categorised as belonging to Level II.

<table>
<thead>
<tr>
<th>Level III</th>
<th>Relatively stable enterprises with future potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Machinery up to 50% depreciated, quality machinery in a well-maintained condition with sufficient capacity.</td>
</tr>
<tr>
<td>2</td>
<td>Purchase of elite seed, on-farm reproduction up to the first generation. Crop rotations are planned and for the most part implemented. Crop and livestock residues are managed, regular applications of lime.</td>
</tr>
<tr>
<td>3</td>
<td>Soil pH-value &gt;5.8, soil organic matter &gt;3%, soil water balance and aeration generally acceptable.</td>
</tr>
<tr>
<td>4</td>
<td>&gt;60 kg/ha nitrogen, &gt;30 kg/ha phosphorus, &gt;20 kg/ha potassium, targeted applications of pesticides and herbicides. Yields: 40 dt/ha wheat, 350 dt/ha sugar beet, &gt;3000 kg of milk per cow and year.</td>
</tr>
</tbody>
</table>

According to the experience and estimates of the extension team with *AKT Vinnytsya*, roughly 10% of the farm enterprises in Ukraine can be categorized as belonging to Level III.
Level IV Top farms often with an external investor

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regular investment in machinery, top-quality machinery in excellent condition and readiness.</td>
</tr>
<tr>
<td>2</td>
<td>Purchase of high-quality seed varieties suited to regional conditions with on-farm reproduction. Crop rotations planned and implemented. Optimal crop and livestock residue management, regular applications of lime according to soil analysis.</td>
</tr>
<tr>
<td>3</td>
<td>Soil pH-value &gt;6, soil organic matter &gt;3.5%, optimal soil water balance and aeration.</td>
</tr>
<tr>
<td>4</td>
<td>&gt;80 kg/ha nitrogen, &gt;40 kg/ha phosphorus, &gt;30 kg/ha potassium, precise applications of pesticides and herbicides. Yields: &gt;45 dt/ha wheat, 400 dt/ha sugar beet, &gt;4000 kg of milk per cow and year.</td>
</tr>
</tbody>
</table>

At most perhaps 2% of the farm enterprises in Ukraine can be classified as belonging to Level IV.

For the ensuing analysis of the economic situation in crop production in Ukraine, a typical, hypothetical 1000 has model farm has been conceived. We abstract from livestock production to simplify the analysis and discussion. Prices, yields, costs, etc. are taken from typical farms in the region around Vinnytsya and are based on observations in the year 2003.

Table 11.1 presents information on the long-term average yields that can be attained by farms in the four intensity categories presented above. Since sugar beet production plays an important role in the region but also places special demands on farm machinery, table 11.1 also illustrates the average share of sugar beet in the crop area for each of the four categories. The average-share of sugar beets on farm enterprises in Ukraine ranges from 10 to roughly 25%. Enterprises belonging to categories I and II use low-quality domestic, unpelleted seed. The resulting crowding leads to depressed yields of 100 to at most 150 dt/ha.

Table 11.1: Crop yields for different levels of intensity

<table>
<thead>
<tr>
<th>Unit</th>
<th>Sugar beet share</th>
<th>Sugar beet yield</th>
<th>Wheat yield</th>
<th>Summer barley yield</th>
<th>Winter rape 00 yield</th>
<th>Sunflower yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I Local management</td>
<td>%</td>
<td>dt/ha</td>
<td>dt/ha</td>
<td>dt/ha</td>
<td>dt/ha</td>
<td>dt/ha</td>
</tr>
<tr>
<td>Level II External investor</td>
<td>10</td>
<td>100</td>
<td>30</td>
<td>25</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Level III</td>
<td>10</td>
<td>100</td>
<td>40</td>
<td>32.5</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Level IV</td>
<td>25</td>
<td>250</td>
<td>50</td>
<td>45</td>
<td>21</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: Own calculations based on farm enterprise analyses in 2003.

Wheat yields range from 30 to 55 dt/ha, although in some years top yields of up to 80 dt/ha can be realized. Summer barley yields (winter barley is a very risky proposition under the agro-climatic condition prevailing in Ukraine and therefore almost non-existent) range from 25 to 50 dt/ha depending on production intensity. Winter rape can attain yields
of between 9 to 27.5 dt/ha, provided that it is not subject to winter kill. Although foreign experts agree that increased rapeseed production would make a valuable addition to the crop rotation in Ukraine, the share of rape is likely to remain quite low due to the relatively high capital requirements associated with this crop. Stable and high yields remain illusive under Ukrainian conditions. The sunflower – the traditional oilseed in Ukraine for agronomic reasons – will continue to be considerably more important than rapeseed. Sunflower production is being increasingly neglected, however, as its high potash requirements are increasingly not met ostensibly due to ‘lack of capital’. Sunflower yields range from 12 to 30 dt/ha. Sufficient levels of potash fertilization are, however, a prerequisite for high yields. For the ensuing calculations of profitability, the following crop shares/crop rotations were assumed for the four intensity levels (table 11.2). Table 11.2 also lists the prices for each of the main crops.

Table 11.2: Crop rotation assumption in the forest/steppe zone of Ukraine for each intensity level (in ha)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
<th>Price (UAH/tonne)</th>
<th>Price (€/tonne)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>450</td>
<td>75</td>
</tr>
<tr>
<td>Summer barley</td>
<td>250</td>
<td>250</td>
<td>200</td>
<td>200</td>
<td>400</td>
<td>67</td>
</tr>
<tr>
<td>Peas</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>550</td>
<td>92</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>100</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>1000</td>
<td>167</td>
</tr>
<tr>
<td>Sugar beets</td>
<td>100</td>
<td>100</td>
<td>250</td>
<td>250</td>
<td>150</td>
<td>25</td>
</tr>
<tr>
<td>Sunflowers</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>1000</td>
<td>167</td>
</tr>
</tbody>
</table>

Source: Own calculations based on farm enterprise analyses in 2003.

Table 11.3 presents the results of the profitability calculations for the four intensity levels. Regarding the method used to calculate profitability, note the following:

- Sales are calculated using the yields, crop shares and prices listed above.
- Specific variable costs include seed, fertilizer, pesticides and herbicides.
- Variable labour and equipment costs include wages (without management), machinery rental, repair and depreciation as well as the costs of fuel and oils.
- Fixed costs include maintenance and depreciation of farm buildings, indirect wages for excess labour, the costs of management and extension, insurance, taxes, land rents and energy; and,
- Interest costs are incurred on the loans used to purchase variable production factors such as seed and fertilizer. These costs are high because credits are provided for interest rates in the neighbourhood of 20% per annum in Ukraine.
Table 11.3: Profit/loss calculations for each intensity level (€/ha)

<table>
<thead>
<tr>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local management</td>
<td>External investor</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>233</td>
<td>326</td>
<td>546</td>
</tr>
<tr>
<td>Special variable costs</td>
<td>58</td>
<td>76</td>
<td>163</td>
</tr>
<tr>
<td>Variable labour and machinery costs</td>
<td>87</td>
<td>95</td>
<td>129</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>74</td>
<td>72</td>
<td>68</td>
</tr>
<tr>
<td>Interest costs</td>
<td>17</td>
<td>22</td>
<td>52</td>
</tr>
<tr>
<td>Total costs</td>
<td>236</td>
<td>265</td>
<td>411</td>
</tr>
<tr>
<td>Profit</td>
<td>-3</td>
<td>61</td>
<td>135</td>
</tr>
<tr>
<td>New investments</td>
<td>0</td>
<td>50</td>
<td>306</td>
</tr>
<tr>
<td>Capital stock</td>
<td>211</td>
<td>229</td>
<td>339</td>
</tr>
</tbody>
</table>

Source: Own calculations based on farm enterprise analyses in 2003.

The results in table 11.3 illustrate that farms operating at intensity level I generate net losses even though their total costs are the lowest of all four groups at 236 €/ha. The corresponding farms will remain unviable as long as they continue to operate without using certified seed, fail to compensate for the nutrients that are extracted from the soil with each year’s harvest, fail to apply appropriate herbicides and pesticides, and fail to carry out important steps in crop production at the appropriate times.

The farms operating at the second level of intensity generate moderate profits and also earn enough to cover the depreciation costs associated with their low level of investment. The higher levels of intensity vis-à-vis the farms in level I lead to a disproportionate increase in yields for the farms operating at the level II. Compared to level II, costs per ha on the farms at level III are 55% higher. As a result, profits increase by roughly 120%. To attain these profits, investments of 645 €/ha are required. On the farms operating at level IV, total costs increase by a further 8% while profits are 27% higher than at level III. However, attaining this level of profitability requires 132% more investment in modern, primarily western, technology than at level III.

Table 11.4 presents more information on the results that are calculated for the four groups of farms. The farms operating at intensity level I are characterized by a high labour intensity of 11.5 labour equivalents per 100 has, and the other indicators for this category of farms are all negative, which underlines the fact that these farms are not viable.

Although the labour intensity is only slightly lower on the farms operating at level II, the indicators in table 11.4 are considerably better than for level I. The high rate of return on equity of 44% should, however, be interpreted with caution as it is based on an overall low level of capital intensity which makes it ‘easier’ to attain high rates of return. As the results for level III illustrate, sustainable competitiveness requires higher levels of investment and capital intensity. The rate of return on equity, at 42%, is only slightly lower than at level II. At 24%, the ratio of labour and variable machinery costs to sales, which provides a good indicator of labour productivity, is, however, considerably better than at level II (29%).

Farms operating at the highest level of intensity (IV) realize a slightly higher rate of profitability (28 as opposed to 25%). However, the rate of return on equity is somewhat lower at 34 as opposed to 42%. The ratio of labour and variable machinery costs to sales falls only slightly to 22 as opposed to 24% at level III. Hence, the significant reduction in
labour intensity to roughly two full-time labour equivalents per 100 has only results in small increases in productivity.

Table 11.4: Crop production indicators for each level of intensity

<table>
<thead>
<tr>
<th>Unit</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of farms in category</td>
<td>%</td>
<td>50</td>
<td>38</td>
<td>10</td>
</tr>
<tr>
<td>Labour intensity</td>
<td>Labour equivalent/100 ha</td>
<td>11.5</td>
<td>10.3</td>
<td>8.7</td>
</tr>
<tr>
<td>Profit per ha</td>
<td>€/ha</td>
<td>-3</td>
<td>61</td>
<td>135</td>
</tr>
<tr>
<td>Profitability</td>
<td>%</td>
<td>-1</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>Ratio of profits to total cost</td>
<td>%</td>
<td>-1</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>Rate of return on equity</td>
<td>%</td>
<td>-3</td>
<td>44</td>
<td>42</td>
</tr>
<tr>
<td>Ratio of labour and variable machinery costs to sales</td>
<td>%</td>
<td>37</td>
<td>29</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: Own calculations based on farm enterprise analyses in 2003.

In summary we can draw the following conclusions:

1. Without a significant increase in the intensity of crop production, Ukrainian agriculture cannot be sustainably competitive.
2. Increases in the use of variable inputs and capital are required.
3. Capital can take the form of local machinery and equipment or western machinery and equipment that is in good repair.
4. The various stages of production should be organized as efficiently as possible, i.e. with as little use of labour and machinery as possible so as to reduce the risks associated with breakdowns and the complexity of management.
5. While it is not necessary to attain the highest levels of capital intensity, modern technology must be applied in core areas such as seedbed preparation, seeding, the application of fertilizers, pesticides and herbicides as well as in harvesting; and,
6. The highest levels of capital intensity are not necessarily profitable as illustrated by a comparison of the results for farms at intensity levels III and IV above.

4 Unit cost calculations

The following unit cost calculations for selected crop products cast light on the international competitiveness of Ukrainian agriculture. These calculations are based on a comprehensive consideration of all costs including a 16% interest rate allowance for the
capital used in production. The results in table 11.5 confirm the main results of the profitability analysis carried out above.

**Table 11.5: Unit costs at different levels of intensity (€/tonne)**

<table>
<thead>
<tr>
<th></th>
<th>Market price</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Local management</td>
<td></td>
<td></td>
<td>External investor</td>
</tr>
<tr>
<td>Winter wheat</td>
<td>75</td>
<td>79</td>
<td>64</td>
<td>67</td>
<td>71</td>
</tr>
<tr>
<td>Sugar beet</td>
<td>25</td>
<td>17</td>
<td>13</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Sunflower</td>
<td>167</td>
<td>177</td>
<td>147</td>
<td>140</td>
<td>119</td>
</tr>
<tr>
<td>Winter rape 00</td>
<td>117</td>
<td>217</td>
<td>247</td>
<td>201</td>
<td>180</td>
</tr>
<tr>
<td>Summer barley</td>
<td>67</td>
<td>88</td>
<td>74</td>
<td>67</td>
<td>70</td>
</tr>
</tbody>
</table>

Source: Own calculations based on farm enterprise analyses in 2003.

Winter rape is included in table 11.5 to complete the presentation and to illustrate first, that market prices for rape remain unattractive in Ukraine, and second that unit costs lie considerably higher than market prices regardless of the level of intensity.

At the average market prices listed in table 11.5, farms operating at the lowest level of intensity are only able to produce sugar beets at a unit cost that lies below the market price. The quality of the sugar beets on these farms is so low, however, and the amount of labour required for thinning out the beet plants so high, that sugar beet production cannot be increased. Crop rotation requirements and the timing of key stages in field work reinforce this limitation. The other crops such as grain and sunflower can only be produced at unit costs that lie above the average attainable market prices. Hence, the production of these crops leads to financial losses even in the short run.

Enterprises operating at intensity level II achieve somewhat better results. However, these farms are also not in a position to make necessary long-term investments in important soil nutrients and modern technology. Hence, the fact that these firms are able to produce winter wheat, sugar beets and sunflowers at unit costs that are slightly lower than the prevailing market prices simply implies that they are faced with protracted economic decline and loss of equity, unless they quickly adopt more sustainable strategies.

At intensity level III, all products with the exception of summer barley and rapeseed can be produced at unit costs that are lower than the prevailing market prices. On farms operating at intensity level IV, unit costs increase somewhat vis-à-vis intensity level III except for sugar beets and sunflower seeds. This is due to the increased use of more expensive modern technology. Unit costs for sugar beet are somewhat lower than at intensity level III as the use of modern technology makes it possible to reduce labour costs for thinning and weeding considerably. Unit costs for sunflower seeds are lower in particular due to improved seeding technology that leads to better spacing and correspondingly higher yields.

The unit costs presented in table 11.5 clearly demonstrate that Ukrainian farmers are able to produce at costs that are quite low in international comparison and, hence, that Ukrainian agriculture does indeed have a significant potential for the profitable production of agricultural commodities.
5 Opportunities and challenges for international investors

The analysis presented above would appear to make Ukrainian agriculture a very interesting object for international investors. Since early 2000, the climate for foreign investment in Ukraine has improved slowly but noticeably.

Generally it is recommended that potential investors plan and implement their investments with the aid of an experienced, local farm consultant firm. Realistically, roughly one year can be expected to elapse between the initial conception of an investment and the first practical farming activities. Given enough time and a competent partner, the following steps can be taken in a constructive and dependable manner:

- Establishing an enterprise in the form of a limited company under Ukrainian law can take place quickly and without difficulty with the help of a local consultant.
- With the help of a competent local consultant it is generally also not difficult to seek and find suitable land for long-term lease. The sale and purchase of land is not permitted under Ukrainian law at the moment. Land lease contracts with the many shareowners of formally collectivized enterprises – or in some cases with limited companies that they have established – require painstaking negotiations based on personal contacts and presentations made by the investor with the aid of the local consultant. Regional (oblast) and county (rayon) administrations are generally willing to cooperate in this regard. Importing and implementing Western technology is much easier nowadays than it was prior to 2000.
- Land lease prices including land taxes amount to roughly 30 €/ha and year. However, investments in basic soil fertility and combating accumulated weed infestations are often required in the first 2-3 years of an investment project.
- As illustrated in table 11.3, establishing and operating a crop production enterprise in Ukraine requires initial investments of roughly 700 to over 1000 €/ha. Loans can be secured provided the investor is able to present a convincing business plan as well as 30 to 40% equity capital. A number of foreign banks such as the German Hypo-Vereinsbank have opened branches in Ukraine.
- Taking legal action in the event of conflicts over contracts such as land lease agreements generally remains a not very promising proposition. The civil courts in Ukraine do not function effectively, making it difficult to secure and enforce claims.
- When selecting workers it is important quickly secure a core group of competent individuals. These must be paid well to ensure that they are properly motivated from the outset.
- As a rule, investors will not, for social reasons, be able to avoid employing additional workers for more simple tasks. To pay these workers it is imperative that the enterprise based on the core staff begin to generate profits within at most 2 to 3 years.
- In the past it has often proven very beneficial when investors provide some financial support for local, village projects (renovation of the church or the fire hall).

Pioneers – the word pioneer is very appropriate in this context – who are committed to an investment in Ukraine, who seek the aid and advice of a competent local consulting
firm, and who come to terms with the local authorities and population, will find that they are able to realize the corresponding Schumpeterian pioneer profits.

6 Challenges facing Ukrainian farm managers

Many of the problems that currently characterize Ukrainian agriculture and that were described above in section 2 can be traced back to insufficient training and management skills on the part of farm managers. When farm managers in Ukraine are asked to list the most pressing problems facing their enterprises, most will mention a lack of capital. It is true that Ukrainian agriculture is extremely undercapitalized. However, the following 2 examples illustrate that typical responses to this lack of capital are generally inappropriate and counterproductive.

- Even taking into account the fact that soil preparation for the seeding of winter grains takes place with old and outdated machinery, insufficient care and diligence when ploughing has led to many fields becoming more and more uneven as time goes by. This makes the ensuing seedbed preparation difficult and expensive. On top of this, managers insist on excessive seeding densities of up to 500 seeds/m², which increase costs further. Seeding does not take place at an even depth, and this increases the risk of winter kill. The resulting problems become apparent when the crops re-emerge after the winter. Either extremely dense, sod-like stands of grain emerge that cannot be raised to generate anything close to the economic optimum. Or a severe winter has wreaked havoc on the unevenly sown seed, leading to significant yield losses and in some cases necessitating complete re-seeding. In this way, poor management exacerbates the prevailing shortage of capital.

- Feed production for dairy cows on Ukrainian farms generally takes place on a very extensive basis, ostensibly due to shortage of capital. As a result of this extensive production, land requirements of 0.8 to 1.0 ha per animal equivalent are common. Since optimising feed production for dairy cows could reduce the corresponding land requirements by 30 to over 50%, and since the land unnecessarily bound in this manner is taken out of potential cash crop production, the opportunity costs of this poor management in feed production are high. The result, again, is to exacerbate the shortage of capital. Many farms continue to use the old, one-dimensional communist full cost accounting system. This obscures the sort of hidden cross-subsidization of farm activities within enterprises described above (i.e. as milk production that takes place at the expense of crop production). As a result, necessary decisions are not taken that would be indicated by modern methods of farm accounting that are standard in western countries.

Both of these examples illustrate that the main challenge facing Ukrainian farm managers is to adapt their production and management methods to the new conditions prevailing in Ukraine. If farm managers resist modern methods and their implementation, Ukrainian agriculture will only be able to make very slow progress and it will take 15 to 20 years before it is able to play the role on international commodity markets that it could given its natural endowments.

Ukrainian farm managers must reconcile themselves to the fact that they will only have access to long-term loans if they are able to demonstrate at least 2 years of significantly improved results in terms of profitability, liquidity and stability. No bank will
be interested in providing long-term credits to farms that have consistently underperformed and are manifestly poorly managed. This also means that Ukrainian farm managers will have to make increased use of external consultancy and farm extension services to help them define strategic goals, develop plans for attaining these goals, and compare goals with actual results to identify remedial actions on a regular basis. Only when farm managers in Ukraine accept that they can and must benefit from this sort of assistance will Ukrainian agriculture be able to take off and experience truly sustainable growth.
Part III:
Developments on Key Agricultural Markets in Ukraine
1 Introduction

Futures markets can provide an efficient tool for farmers, traders and processing companies to reduce the price risk associated with the trade of agricultural commodities. Even more important, a well functioning futures market increases the price transparency on agricultural commodity markets and provides valuable and inexpensive information for all market participants, including those who do not trade on the commodity exchange. Futures markets for agricultural products have gained considerably in importance over the last 20 years, and have been established in an increasing number of countries – for example Hungary and Germany in the 1990s, and China in recent years. This paper provides an introduction to the functioning of futures markets for those who are not familiar with this risk-management tool. It is structured as follows: section 2 explains the nature of futures markets, and in section 3 an overview is given on how futures markets are organised. How farmers can profit from the existence of futures markets is discussed in section 4. Section 5 specifies the policy requirements for a functioning futures market in Ukraine.

2 The nature of a futures market: Trading risk – not grain

When the idea of establishing an agricultural commodity exchange for the trade of agricultural futures contracts was discussed in Germany in the early 1990s¹, many farmers, journalists and even scientists had a wrong perception:

1. A first concern was that the establishment of a futures exchange might have a negative impact on small producers. In fact, many people believed that futures only benefit big players, and that these markets can worsen the situation of farmers.

2. Second, many people believed that futures markets provide for another marketing channel, i.e. that the existence of a futures market means that farmers can sell their products not only to the local elevator or processor, but also at the futures exchange.

Both assessments are wrong. In fact, futures markets provide valuable and inexpensive information for everybody in the market, especially for farmers, who are normally not able to maintain their own market information systems. This means that they especially improve the information available to farmers, thus strengthening their competitive position relative to big players. Second, futures markets do not provide a new marketing channel. In fact, the basic idea is that of trading risk, not agricultural commodities such as grain. The scepticism futures markets are viewed with is probably due to the fact

¹ Futures markets for agricultural commodities have existed since 1860 in the US. For a variety of historical reasons, commodities futures were forbidden in Germany for many decades, and it was not until the early 1990s that policy makers decided to legalise them again.
that they are complex and their functioning requires some explanation. This is provided in the following:

2.1 The forward contract

The nature of a futures contract can probably best be explained by its historical development out of forward contracts, which are widely used also in Ukraine. In such a contract, two partners typically agree on the future delivery of a certain amount of a commodity: for example, in March a farmer signs a contract in which he promises to deliver 100 tonnes of 3rd class wheat to a trader in August of the same year. This is a private contract and the contract partners have to agree on many details individually, including among others the quality of the grain, the delivery date and location, and appropriate sanctions in case one of the parties does not fulfil the contract. Such a contract is concluded voluntarily and has many advantages for the contractors. Both of them know about the price and the quantity delivered in advance. This enables farmers to plan their production and processors to use their storage and processing facilities more efficiently, and can, therefore, reduce their costs (processors have to provide less storage facility due to in-time delivery of the grain, etc.).

On the other hand, once such a contract has been signed, it is difficult to step back from it even if the farmer cannot deliver (for example due to crop failure). This has to be distinguished from the enforceability of forward contracts. Often a situation arises in which the price has dropped compared to the expected price. In this case the buyer has an incentive not to take delivery of the commodity under the terms of the forward contract but rather to buy it on the market at the prevailing (lower) spot price. The seller, on the other hand, has an incentive to breach the forward contract if the market price has increased. If one contract partner breaches the contract, the other can take legal action. But this costs time and money for lawyers for example, and there is no guarantee that the legal action will be successful. Even if it is, the losses incurred (for example due to a production standstill etc. caused by the breach of contract) may not be fully compensated.

2.2 Contract enforcement

This is the reason why a system was developed in the 1860s in Chicago that ensures contract enforcement in a simple way. Actually, this so-called clearing system is at the core of any exchange world-wide. If two partners have signed a contract in March for the delivery of 100 tonnes of grain in August for the price of 500 UAH/tonne they employ a third and independent party. This party, called the clearinghouse, ensures contract enforcement. When the contract is signed, both contractors make a deposit – the so-called margin – with the clearinghouse. If the margin is for example 10% of the contract volume\(^2\), it amounts to 5 000 UAH for the contract outlined above (10% of 100 tonne \(\times\) 500 UAH/tonne).

When the contract is due in August, several situations can arise (table 12.1):

The market price is 500 UAH/tonne (see the third to last row in table 12.1). This means that neither the buyer nor the seller have lost any money in comparison to the market

\(^2\) How the margin is set is explained in greater detail below.
price they expected. The clearinghouse transfers the initial margin back to the two contractors after the contract is fulfilled.

If the price has risen – for example to 550 UAH/tonne – the buyer is better off (see the second to last row in table 12.1). According to the contract he pays 500 UAH/tonne for grain that is worth 550 UAH/tonne on the spot market. Hence, he pays 50 000 UAH instead of 55 000 UAH, which is to his advantage. But the seller is disappointed. He is obliged by the contract to deliver grain for 500 UAH/tonne that he could sell for 550 UAH/tonne. So the seller has an incentive to breach the contract. However, if he does so, the clearinghouse will not return his 5 000 UAH margin but transferred to the buyer. Hence, the buyer gets his margin back (5 000 UAH), plus the seller’s margin (5 000 UAH). Even though he is forced by the seller’s breach of contract to purchase his grain on the spot market for 55 000 UAH, the receipt of the seller’s margin leaves him with a net payment of 50 000 UAH; as if the contract had been fulfilled. Similarly, the seller receives 55 000 UAH for his grain on the spot market, but he forfeits his 5 000 UAH margin. In the end he too is faced with the same conditions as stated in the original contract.

Table 12.1: How the margin system functions

<table>
<thead>
<tr>
<th>Date</th>
<th>Price in UAH/tonne</th>
<th>Sellers position</th>
<th>Buyers position</th>
<th>Clearinghouse accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seller and buyer conclude on a contract, delivery August</td>
<td>5000</td>
<td>5000</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>500 UAH/tonne</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The total contract volume amounts to 50 000 UAH</td>
<td></td>
<td>5000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contractors deposit 10% of the contract volume at the clearinghouse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>450</td>
<td>5000</td>
<td>5000</td>
<td>10 0000</td>
</tr>
</tbody>
</table>

The opposite holds if the price has dropped. In the last row of table 12.1, it is assumed that the price has fallen to 450 UAH/tonne. In this situation the buyer has an incentive to breach the contract, but since he forfeits his margin as a result, at the end of the day both he and the seller face an effective price of 500 UAH/tonne. The function of the clearinghouse is thus to compensate the parties for the losses and profits that have occurred. And if each contract partner deposits a certain percentage of the total contract volume at the clearinghouse, contract enforcement is ensured as long as the price does not change by more than this percentage. A margin of 10% (20%) enables the clearinghouse to level out profits and losses up to a price change of 10% (20%).

Of course, prices can change by more than 10% or even 20%. So it might appear reasonable for the clearinghouse to demand a much higher margin. However, it would be quite expensive for the contract partners to deposit 50% or even more at the clearinghouse. Therefore, over time exchanges developed the so-called margin-call system. If the price on the market drops (rises) by more than 10% during the contract span, the clearinghouse asks the buyer (seller) for an additional margin. This so-called margin call ensures that at any time the clearinghouse can compensate the other party if one party breaches the contract. Changing market prices automatically trigger margin calls, and therefore profits and losses are levelled out during the contract span. This is a major difference to forward contracts, where profits and losses are levelled out on the date of delivery.

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3 In practice, the collection and management of margin calls is more complicated. For an overview see for example Chicago Board of Trade (1997).
2.3 The standardisation of futures contracts

A second important feature of a futures market is the standardisation of contracts. The specification of a futures contract is not individually negotiated by the contract partners. Instead, the partners purchase contracts that have been standardised by the exchange. A typical contract at the Chicago Board of Trade (CBoT)4 is the wheat contract. The so-called contract specifications are the size (5000 bushel of wheat, where one bushel of wheat is 27.216 kg), the deliverable grades (No. 2 Soft Red, No. 2 Hard Red Winter and other varieties), the delivery location (for example one or more ports on the Mississippi river) and the delivery month (July, September, December, March and May). The latter means that different contracts for the same commodity are traded at futures exchanges; these contracts are identical in all but one respect, the delivery date. Hence, somebody who wishes to use futures contracts has to decide on the delivery month and then buy or sell a contract at the exchange at the prevailing price.

2.4 Actual delivery: The exception, not the rule

The future contract certifies a commitment to deliver (seller) or to accept (the buyer) a certain amount of a certain product at a certain place and point in time (the delivery month). One can easily imagine that this commitment can be traded. It does not matter for the buyer A whether seller B or C is the contract partner. And for the seller D of a contract, it does not matter whether buyer E or F promises to take delivery. Hence, once concluded, futures contracts can be traded.

Furthermore, buyers and sellers are seldom interested in actually fulfilling their contracts; they rarely use futures markets as a means of trading physical commodities. Instead, they use futures markets as a risk management tool5. A farmer who in the month of March sells a September wheat contract for 500 UAH/tonne knows that he will end up receiving 500 UAH/tonne for his wheat, regardless of how the spot price develops in the interim. Even if the spot price has fallen and he only receives 450 UAH/tonne, he will be reimbursed by the mechanism described above for the difference of 50 UAH/tonne. So selling a futures contract is a means of ‘locking in’ a price. This reduces risk and allows the farmer to concentrate on doing what he does best (farming), rather than worrying about prices. The same holds true for the buyer, and thus the demand side of the market such as compound feed producers or flour mills.

Note that both the buyer and the seller will end up trading the actual physical grain on the spot market. To cancel their respective commitments to sell on the futures market, a farmer will buy the offsetting futures contracts at the same time as he sells his grain on the spot market. The farmer will thus hold two contracts at the exchange, one in which he promises to deliver, and another one in which he promises to take delivery. These commitments offset one another, leaving the farmer with no net commitment or ‘open position’ on the futures market. The buyer will do the opposite to cancel his commitment. Actually, on most futures exchanges world-wide less than 2% of all the contracts are concluded with physical delivery. Hence, the futures exchange is not a new marketing

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4 See www.cbot.com.

5 This process is called ‘hedging’ and explained in detail in section 4.
channel for commodities but rather a place where the risk of falling or rising prices is traded.

2.5 **Summary: The difference between a forward and a futures contract**

The differences between forward contract and futures contracts are summarised in table 12.2. They include standardisation, tradability, integrity (how contract enforcement is ensured), payment, fulfilment, transaction costs (all costs that are accompanied with the search for a contract partner, negotiations, concluding a contract and contract enforcement), and risk.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Forward contract</th>
<th>Futures contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardisation</td>
<td>Not necessarily standardised, but mostly concluded among the contractors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quantity, quality, place and time of delivery are standardised</td>
<td></td>
</tr>
<tr>
<td>Tradability</td>
<td>Almost no tradability, i.e. contracts cannot be traded on the market</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contracts can be traded. Tradability depends on the trade volume at any exchange</td>
<td></td>
</tr>
<tr>
<td>Integrity (contract enforcement)</td>
<td>The same as in any other trade contract</td>
<td>Is guaranteed by the exchange, i.e. the clearinghouse</td>
</tr>
<tr>
<td>Payment</td>
<td>Normally with delivery</td>
<td>During the duration of the contract via the margin mechanism</td>
</tr>
<tr>
<td>Fulfilment</td>
<td>Physical</td>
<td>Settlement, i.e. taking out an off-setting position</td>
</tr>
<tr>
<td>Transaction costs</td>
<td>Individually negotiated</td>
<td>Brokerage fee and interest rates on margins</td>
</tr>
<tr>
<td>Risk</td>
<td>Contract fulfilment</td>
<td>The so-called basis risk and some others</td>
</tr>
</tbody>
</table>

Source: **NELSON** (1985, p. 17)

Nevertheless, futures contracts are not perfect substitutes for forward contracts. Instead, a functioning futures market can complement the forward market. A trader, for example, might be reluctant to offer a forward contract to a farmer for the purchase of a certain amount of grain after the harvest, because he does not know what the price will be following the harvest. He is confronted with a price risk. If the price after the harvest is lower than was concluded in the forward contract, the trader will incur a loss. A functioning futures market enables him to reduce this price risk, as outlined above, and this will make him less reluctant to offer forward contracts to farmers, other things being equal. Hence, offering forward contracts to farmers is less risky with a functioning futures market than without.

3 **Futures markets organisation**

An exchange where futures contracts are traded is essentially organised like any other exchange. Its heart is the trading place where offers are made by so-called brokers\(^6\). A contractor (for example farmer, food processor or trader) who wants to conclude a contract at the exchange first has to approach a registered broker. The broker is responsible for the contractor’s margin and has to ensure *vis-à-vis* the clearinghouse that all margins and margin calls are paid in time. The broker then enters a corresponding offer on the exchange. A typical order is, for example, that the farmer asks the broker to sell a contract (e.g. wheat,  

\(^{6}\) Brokers are sometimes called traders. The word ‘trader’ used in this sense should not be confused with trader in the sense of a commodity trader such as Cargill or Nibolon.
delivery March) within a certain price range – e.g. from 480 UAH/tonne to 500 UAH/tonne – or not to sell at a price lower than 500 UAH/tonne. The broker then looks for another broker who wants to buy a March wheat contract within the same price range. The brokers meet and trade contracts in a so-called ‘pit’ at the CBoT. In Hannover in Germany, on the other hand, a computerised trading platform was established. The computer system matches two offers if the brokers have put the same price or price range into the system. If so, a contract is automatically concluded.

**Figure 12.1: How a futures exchange is organised**

Those who trade on an exchange can be divided into two major groups:

- **Hedgers**, as discussed above, are those market participants who have the physical agricultural commodity at some future date and who are interested in reducing the associated price risk (hedging). Their aim to buy or sell futures contracts to offset the risk of changing prices on the spot market. In agriculture, farmers, traders and processors use futures to protect themselves from changing spot market prices.

- **Speculators** take on the risk that hedgers wish to avoid. Speculators buy or sell contracts based on their beliefs that prices will either rise or fall; speculators believe that they know ‘where the market is going’. Driven by potential profits, speculators provide the marketplace with an essential element – liquidity – enabling hedgers to buy or to sell contracts whenever they wish. This liquidity is important because it guarantees that hedgers will always be able to buy or sell offsetting contracts and thus close any open position on the futures market. Furthermore, to make sound forecasts of future price developments, speculators have an incentive to collect as much information as possible on the agricultural market in question.

This behaviour is very important, because whenever a speculator manages to find a new piece of information, his subsequent trading activity on the futures market effectively makes this information public. If, for example, speculators receive plausible new information that the next wheat harvest in China will be smaller than anticipated, they will
expect world market prices to increase. Hence, they will buy futures contracts today in the
hope of selling them later at higher prices. These purchases, however, will drive up the
prices of those futures contracts. In effect, therefore, the speculators’ information will be
incorporated into prices on the futures market, making it accessible to all. The price of a
futures contract can therefore be seen as a sort of forecast that at any given point in time
incorporates all the relevant information available on the market in question.

Trading on futures exchanges is not free of charge. First, the broker and the exchange
have to be reimbursed for their services. They change fees that generally amount to some
0.5% of the contract volume, but can differ depending on the size of the orders and the
market structure. Furthermore, the hedgers and speculators have to deposit the margin. As a
rule, this deposit does not bear any interest payments. Hence, the margin and margin calls
reduce liquidity and profitability in form of the foregone interest payments. At some
exchanges the clearinghouse accepts bank or other securities such as shares as deposits.

4 Futures markets – a useful tool for farmers and others

4.1 Futures markets increase market transparency

Futures markets are efficient tools for all market participants that increase market
transparency and provide price forecasts that would not otherwise be available in this form.
EU farmers, for example, who sell rapeseed to a Co-operative or private trade, often use the
price quotation at the MATIF, the exchange in Paris. The MATIF quotation is readily
available via telephone or internet, and the availability of this information to all participants
reduces the information advantage that larger companies would otherwise have vis-à-vis
small farmers. Futures markets also help farmers to make better price forecasts. Farmers can
use this information to plan their production. Brazilian farmers, for example, have any
incentive to increase their soybean acreage when prices for future contracts at harvest time
in Brazil quote high, and vice versa. In general, such information enables farmers to make
more efficient decisions on input use and, therefore, the amount of grain to produce. It helps
mills and other processing companies in their price negotiations with traders and farmers,
and provides banks with useful information on the revenue farms can earn and, therefore, on
their creditworthiness. Indeed, in some cases in Western countries, banks will insist that a
farmer hedge his crop on a futures market as a precondition for providing this farmer with
credit.

However, it is important to consider:

- Futures markets do not have a systematic impact on the price volatility on
  agricultural commodity markets. By improving the information basis available to all
  market participants they can lead to more efficient production, storage and marketing
decisions. While this might have the effect of levelling out some price peaks, the
extent of this effect is difficult to assess. But the existence of futures markets
definitely does not change key market fundamentals that determine spot prices such
as Ukraine’s net trade position, the size of the crop, or the level of world market
prices.

- Futures markets do not provide anything resembling an intervention price system.
The situation on the grain market in 2004 is a good example. A futures market would
probably have ‘predicted’ the price decrease after the 2004 crop earlier, but it would have done nothing to stop this collapse.

4.2 Hedging or how to reduce price risk from the farmers perspective

As outlined above, hedging is the most important motive for using futures markets. A typical hedge will be explained in the following using a simple example. Assume that after the harvest in October 2004, prices for wheat are rather low at 545 UAH/tonne. A Ukrainian farmer therefore decides not to sell but rather to store 100 tonne of wheat until next year, in the hope that prices will climb. Of course, in October 2004 he does not know what price will prevail next March, for example. Hence, by deciding to store his wheat the farmer is actually speculating. Since storage is costly, the farmer will incur a profit only if the price increase between October and March is higher than his costs of storing, the opportunity cost of the capital that is tied up in the stored wheat, and the risk that pests etc. might damage this wheat. Since there is no way of knowing for certain that prices will increase by at least this amount, storage is risky.

One option that the farmer could use to reduce this risk is to conclude a forward contract, delivery March 2005, with all the accompanying advantages and disadvantages. Another option would be to sell a futures contract. Assume that a well functioning futures exchange exists in Ukraine. This exchange offers a contract for 100 tonnes of 3rd class wheat, delivery date March 2005. At the end of October 2004, the domestic milling wheat price in Ukraine was quoted at 545 UAH/tonne. Assume that the price quoted at the end of October for the March contract is higher – 650 UAH/tonne. According to the farmer’s calculations, this price is high enough to cover all his storage costs and provide him with a reasonable profit. Hence, via his broker he sells a March futures contract on October 25. Of course, the farmer has to deposit a margin. For simplicity the margin is assumed to equal 10% of the contract volume. Hence, the farmer deposits 6 500 UAH with the clearinghouse.

Time goes by and prices change. At first, in November and December, prices increase, reaching 700 UAH/tonne. This means that the spot price (700 UAH/tonne) has increased to a level that exceeds the price at which the farmer has committed himself to deliver in March (650 UAH/tonne). However, since the difference between these two prices (50 UAH/tonne) is less than 10% of the futures price (50 equals only 7.7% of 650 UAH), it is covered by margin.

In January the government decides to cancel the import duty on grain due to an emerging shortage of milling wheat. As a result, the domestic wheat price falls back to 600 UAH/tonne where it remains for the next few months. At the end of February the farmer decides to sell the wheat he has stored. At the prevailing spot price of 600 UAH/tonne, his revenue amounts to 60 000 UAH. However, he still owns the March 2005 futures contract; this contract commits him to delivering 100 tonnes of wheat in March for a price of 650 UAH/tonne. To cancel this commitment he now buys an offsetting contract. This contract now costs 600 UAH/tonne, the prevailing spot price of wheat7. Since he originally sold for 650 UAH/tonne and now buys for 600 UAH/tonne, the farmer realises a profit of 50 UAH/tonne on the futures market. This translates into an additional 5 000 UAH of revenue, leaving him with total revenue of 65 000 UAH (60 000 from the

7 We explain why this is the case below.
sale of grain and 5 000 from the clearinghouse). This is exactly what the farmer expected when he ‘locked in’ the price of 650 UAH/tonne on the futures market in October. Of course, since he has no open commitment on the futures market, the exchange returns the margin of 6 500 UAH originally deposited in October. Table 12.3 provides an overview of the transactions associated with the hedge.

**Table 12.3: A typical hedge transaction using futures**

<table>
<thead>
<tr>
<th>Month</th>
<th>Transaction Description</th>
<th>Price on the spot market</th>
<th>Price of the March 2005 futures contract</th>
<th>Futures price minus spot price (basis)</th>
<th>Revenue (costs) in UAH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 2004</td>
<td>Sell futures contract</td>
<td>545</td>
<td>650</td>
<td>105</td>
<td>(6500) margin deposit</td>
</tr>
<tr>
<td>Mar. 2005</td>
<td>1) Buy futures contract</td>
<td>600</td>
<td>600</td>
<td>0</td>
<td>1) 5000 futures price difference</td>
</tr>
<tr>
<td></td>
<td>2) Sell wheat on spot market</td>
<td></td>
<td></td>
<td></td>
<td>2) 60000 sales revenue</td>
</tr>
</tbody>
</table>

Source: Own presentation.

In this example we have assumed that as the expiry date of the futures contract approaches (in other words, as this contract approaches so-called ‘maturity’), the price of this contract will equal the prevailing spot price (600 UAH/tonne). The difference between the price of a futures contract on its date of maturity and the spot price on this date is referred to as the maturity basis (see table 12.3). The maturity basis will tend to equal 0 because if it does not, market participants will either buy or sell futures contracts with a view to delivering them with physical commodities that have been sold or bought on the spot market, respectively. For example, if the spot price equals 600 UAH/tonne and the futures price equals 650 UAH/tonne shortly prior to maturity, a trader can sell futures contracts and deliver them with wheat purchased on the spot market, making a profit of 50 UAH/tonne (minus transaction costs). Since many traders will want to take advantage of this risk-free opportunity to make profits (this is referred to as arbitrage), the demand for grain on the spot market and the supply of futures contracts will both increase. This will drive the spot price up and the futures price down until, in equilibrium, these prices are equal and the maturity basis is 0.

If the spot price had risen to 700 UAH/tonne (i.e. a level above the futures price he ‘locked in’ in October), the farmer would have had to buy his offsetting contract for 700 UAH/tonne (based on a maturity basis of 0). He would have thus realised a loss of 50 UAH/tonne (= 700 – 650) or 5 000 UAH on the futures market. However, he would have received 70 000 UAH on the spot market. Again, he would have ended up with net revenue of 65 000 UAH from selling 100 tonnes of wheat. Regardless of how the spot price develops, by hedging his wheat on the futures market in October, the farmer is able to guarantee himself the price of 650 UAH/tonne. In retrospect he might regret having hedged, because the spot price is higher than 650 UAH/tonne, but *ex ante* (i.e. in October 2004) it is just as likely that the price might fall below 650 UAH/tonne, leaving him with a loss. If he does not wish to speculate, hedging provides a rational and efficient alternative.

### 5 Preconditions for functioning futures markets in Ukraine

The previous sections have explained the functioning of a futures exchange in general and how traders, processors and farmers can use it to hedge their price risks on the
spot market. The basic mechanism is that gains and losses on the spot and futures market cancel out each other. However, this mechanism function only works adequately under certain conditions, which are currently not fulfilled in Ukraine.

5.1 The role of basis risk and domestic price formation

Perfect hedging has been demonstrated in table 12.3 above. This example is repeated in table 12.4 below in the first scenario. In the first scenario the hedge functions perfectly because the price difference between the spot and the futures market (generally called the basis; and maturity basis at the moment of contract fulfilment) is equal to zero. If this is not the case, hedging will not work perfectly. Let’s assume that the farmer who wishes to hedge a grain sale lives in Sumy, while the futures market is located in Kiev. Kiev is a deficit region where prices are usually higher than in regions with surpluses such as Sumy. This price difference is not a problem per se, as scenario 2 demonstrates. The hedge works perfectly despite the price difference of 30 UAH/tonne. The decisive factor is that the basis has not changed over the duration of the futures contract.

Table 12.4: Hedging price risks at a hypothetical Ukrainian futures exchange under various scenarios of price formation on domestic agricultural markets

<table>
<thead>
<tr>
<th>Month</th>
<th>Transaction</th>
<th>I: Price on local spot market</th>
<th>II: Price on futures market</th>
<th>II - I (Basis)</th>
<th>Revenues on futures and spot market</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Sale of wheat on spot market</td>
<td>600</td>
<td>600</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>March 2005</td>
<td>1. Purchase of futures contract</td>
<td>515</td>
<td>650</td>
<td>135</td>
<td>-6500 Margin</td>
</tr>
<tr>
<td></td>
<td>2. Sale of wheat on spot market</td>
<td>570</td>
<td>600</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own presentation.

Scenario 3, however, demonstrates that hedging becomes less effective the more the difference between the spot and futures markets becomes unpredictable. This phenomenon is called basis risk. We assume that the initial price difference is 30 UAH/tonne, but that this may change over the duration of the futures contract. If, for instance, the Sumy oblast administration decides (as has often been the case in Ukraine) to ban all grain shipments beyond the oblast border in February, the prices in Sumy will be lower than expected, and the price difference to Kiev will widen, in scenario 3 to 60 UAH/tonne. As a result, hedging does not work perfectly any more, as the farmer does not realise the expected combined revenue of 62 000 UAH (650 UAH – 30 UAH * 100 tonnes) as in scenario 2, but only 57 000 UAH.
Nevertheless, the farmer is still better off with hedging as long as the spot market price fluctuations are larger and move in the same direction as the changes of the basis. The degree up to which hedging in Ukraine may be efficient therefore hinges upon the degree to which regional prices within Ukraine are integrated, i.e. move in the same direction. The frequent barriers to domestic trade in agricultural commodities in Ukraine therefore constitute a serious obstacle to the development of a futures exchange.

### 5.2 Political obstacles to a Ukrainian futures exchange

From the above considerations substantial consequences for Ukrainian agricultural policy can be derived. Generally, a futures market cannot function in a country where the state actively tries to influence market outcomes, as this creates a policy risk which is difficult to estimate, particularly for small futures market participants. More specifically:

- Any plans for the creation of a market intervention system with minimum prices are fundamentally at odds with a functioning commodity exchange. The two systems cannot properly co-exist. European experience shows that futures contracts are only successful for commodities that are not subject to active price and market interference (pigs, potatoes, and rapeseed). Futures contracts for products subject to the intervention system have not been successful so far, e.g. the wheat contract in Hanover or at the MATIF in Paris.

- Granting import quotas on a discretionary basis, as has happened in the area of raw sugar, offer the importers the opportunity to influence domestic prices and thus realise risk-free rents at the futures exchange. More generally, this triggers the question whether the Ukrainian market is not too small to avoid the influencing of market prices by big public or well-connected private actors.

- Generally, the frequent discretionary interference on markets by regional or national policy is a serious obstacle to functioning futures contracts. For instance, Ukrainian policymakers are often not happy with price changes for food products as a consequence of low harvests, and react by imposing maximum prices and trade margins, as for instance in the aftermath of the failed wheat harvest in 2003.

- A strong and completely independent legal system is a prerequisite for avoiding insider trading that would quickly discredit and cripple any futures market in Ukraine. As long as the legal instruments and independence needed to punish such behaviour – regardless of who is the perpetrator – are not developed, Ukraine should not pursue the development of a futures market.

A fundamental and open question is whether Ukraine needs its own futures exchange in the first place, or whether contracts which are specified for Ukraine could be traded at larger and better established exchanges in Europe. There are indications that international grain markets are becoming increasingly complex and diversified. The existing exchange in Hungary is now inside the EU, where agricultural markets remain insulated from some world market influences. Hence, there may be too much basis risk associated with contracts on the Budapest Exchange from a Ukrainian market perspective. In recent years, US markets have repeatedly ‘disconnected’ from the rest of the world, and Chicago futures have therefore lost some of their power as a hedging tool in international agricultural trade. At the same time, the Black Sea region is emerging as a major ‘driver’ of international grain markets in its own right. Hence, establishing future contracts with Black
Sea region specifications on established exchanges elsewhere in the world or perhaps even on a new exchange in Ukraine deserves careful consideration in the coming years.

6 Summary

As in other countries where futures markets were unknown until recently – Germany is a good example – the nature and the functioning of future markets are often not well understood in Ukraine. In this paper we have presented a brief overview of how futures markets work and what they can and cannot be expected to provide. The most important points are summarised in the following:

1. Futures markets do not provide a new marketing channel. In fact, the basic idea behind the use of futures markets is that of trading risk, not physical agricultural commodities. On futures markets risk is transferred from those who are not willing to bear it, such as farmers, processors or traders, to speculators who are.

2. Futures exchanges provide farmers, traders and processors with a tool for reducing the price risk associated with dealing in agricultural commodities. This mechanism is called hedging. Hedging on futures markets costs some 0.2 to 0.5% of the contract volume. Furthermore, since hedgers are required to deposit margins, hedging does reduce their liquidity.

3. Futures markets provide valuable and inexpensive information for everybody in the market – especially for farmers, who are normally not able to maintain their own market information systems. Futures markets therefore tend to improve the relative competitive position of farmers and other ‘small players’ on agricultural markets, even if these small players do not actively use the futures market for hedging themselves.

4. Futures markets do not systematically reduce price volatility on agricultural commodity markets. They also cannot provide anything resembling an intervention price system. Hence, the existence of a futures market in Ukraine would not have prevented any of the major price fluctuations that have occurred on Ukrainian grain markets due to harvest fluctuations in recent years, for example.

5. Establishing a futures exchange in Ukraine would require a lot of time and careful planning. Any mistake made during this process has the potential to endanger the viability of this project.

6. Well-integrated commodity markets are a very important prerequisite to make Ukraine an attractive location for a futures exchange. The question is whether the government is ready to abstain from political interventions which hamper the formation of well-interlinked markets, both within Ukraine and between Ukraine and the rest of the world.

7. An open question is whether Ukraine needs its own futures exchange, or whether contracts which are specified for Ukraine could be traded at larger and better-established exchanges in Europe. There are increasing indications, however, that international grain markets are becoming increasingly complex and diversified. The Black Sea region is emerging as a major ‘driver’ of international grain markets in its own right, and this suggests that the possibility of establishing a futures exchange in
the region (or at least trading contracts with Black Sea region specifications on other exchanges) deserves careful consideration.

7 References

13 The Oilseed Export Tax Revisited

ARMIN KUHN & OLEG NIVYEVSKIY

1 Introduction

Sunflower seed (sunseed) is a crop for which Ukraine definitely has a comparative advantage. Over the last decade Ukraine has accounted for 10-16% of the total world production of sunseed and for 5-39% of the total world trade in this product. Sunseed is also the basis for the country’s vegetable oil industry, which had a market share of about 16% on the world sunflower oil (sunoil) market in 1999-2000. Of course, while producers are interested in higher domestic sunseed prices, sunoil producers (crushers) prefer lower prices and sufficient supply of cheap raw materials. As a consequence, it is no wonder that Ukrainian policy makers have repeatedly been confronted with the issue of export taxes for oilseeds. In October 1999, a 23% export tax was introduced. In July 2001 this tax was cut to 17%. A further cut has been proposed, but this proposal has encountered fierce resistance from the sunseed crushing lobby which has proposed instead the introduction of a production subsidy for farmers that would compensate for the losses caused by depressed domestic prices for sunseed.

The aim of this paper is to first give an overview of recent developments in the sunseed sector in Ukraine, and then to empirically analyse policy options regarding the export tax. Our analysis uses employs the recently devised partial equilibrium ‘Regionalised Agriculture Sector Model for Ukraine’ (RASMU). Our main finding is that the proposed production subsidy for sunseed producers would compensate them for the losses they incur as a result of the export tax, but at a considerable cost. It would also perpetuate the rents received by sunseed crushers.

2 The sunseed sector in Ukraine

2.1 Sunseed production

Sunseed is one of the major crops produced in Ukraine, and among the world’s largest producers Ukraine is ranked third, after Argentina and Russia (figure 13.1). World sunseed production has been increasing over the last decade, from 23.5 mill. tonnes on average in the mid-1990s to 26.26 mill. tonnes in 2003/2004. Ukraine has followed this trend as, over the period 1990-2003, its sunseed production grew modestly. The volume of production increased from 2.72 mill. tonnes in 1990 to 4.25 mill. tonnes in 2003, but for the remaining years was comparable to 1990.
The best growing conditions can be found in the steppe climatic zone, and almost 90% of Ukrainian sunseed production is concentrated in the eastern and southern oblasts and on large farms. Sunseed accounted for only about 15% of the total harvested area in Ukraine in 2003. However, in the main producing regions this share is much higher (e.g. 32% Dnipropetrovsk and 42% in Donetsk) and clearly higher than the recommended maximum share in crop rotations (20-25%). Indeed, many producers grow sunseed every two years on the same plot. If this practice continues, declining yields will probably constrain further production growth. The 1990s have already witnessed a decline in average yields.

Although sunseed yields less gross revenue per hectare than winter wheat or barley, it is still said to be more profitable than competing crops. According to FAO estimates, average gross revenue for sunseed in 2001 and 2002 was 173 US$/ha, compared with 187 US$/ha for winter wheat. After subtracting average variable costs, gross profits were 101 US$/ha for sunseed and 82 US$/ha for winter wheat. The difference is mostly to the lower seed costs for sunflower (26 US$/ha for sunseed versus 55 and 50 US$/ha for winter wheat and barley, respectively). Net profits for sunflower seed and winter wheat were 46 and 9.1 US$/ha, respectively.

While Ukraine is one of the three largest sunseed exporters, Ukraine’s world market share is not stable due to widely fluctuating harvests at home and abroad (figure 13.2).

---

1 Actual revenues, costs and profits will vary across regions, farms and time. In Chapter 10 on *Farm Management Challenges in Ukrainian Agriculture* data on the profitability of different crops in Ukraine is also presented.
Figure 13.3 provides a monthly retrospective on Ukrainian exports and prices of sunseed between 1998 and 2003. After the introduction of the 23% tax, a differential between domestic and world market prices emerged in late 1999-2000 (16% on average) which, however, faded in the course of 2001 due to loopholes in the administration of the tax. The lowering of the tax rate to 17% in 2001 was accompanied by the closing of these loopholes, and a gap between domestic and international prices (13% on average) emerged in 2002.

Table 13.1 summarises sunseed commodity balances over the period during which the oilseed export tax was in force. It is characterised by two developments. First, despite the introduction of the export tax, sunseed production tended to increase throughout the period, probably because of the bullish world market trend. Second, while production grew, exports fluctuated around a more or less constant trend as domestic crushing of sunseed expanded. This may be interpreted as a result of the export tax which helped the crushing industry to acquire raw materials for lower prices than would have prevailed without the tax.
2.2 Overview of the crushing industry development

The volume of sunseed processing in Ukraine has followed a U-shaped trend with little net change over the last decade. The volume of sunoil produced dropped from 0.92 mill. tonnes in 1992/93 to 0.45 mill. tonnes in 1996/97, and then recovered to 1.2 mill. tonnes in 2002/03. In the mid-1990’s, producers and traders found exporting more lucrative than selling sunseed to domestic crushers, who could simply not compete with foreign rivals. Low processing efficiency was a key feature of domestic crushers at this time (VON CRAMON-TAUBADEL, 1999), as due to outdated technology and high energy consumption processing costs varied between 29 and 60 US$/tonne, compared with 27 US$/tonne in Western Europe. Due to a lack of liquidity, 80% of sunseed processing was conducted under tolling schemes, according to which crushers took 20% of the sunoil yield as their processing charge. Crushers only paid cash for 16% of the sunseed they procured,
and the rest was bartered. Hence, producers and traders preferred to sell abroad for cash. However, sunseed processing and production of sunoil increased significantly after the export tax on oilseeds was introduced.

Table 13.2 shows that production of sunoil gradually increased from 1998/99 onwards, 2001/02 was an exception due to the bad harvest in 2001. About 50% of Ukrainian sunoil is consumed domestically, and the rest is exported. According to FAO estimates, bottled sunoil accounts for about ¾ of total domestic vegetable oil consumption.

### Table 13.2: Sunoil balances in Ukraine (1998-2004)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crush</td>
<td>1300</td>
<td>2100</td>
<td>2330</td>
<td>2070</td>
<td>2800</td>
<td>3200</td>
</tr>
<tr>
<td>Beginning Stocks</td>
<td>9</td>
<td>7</td>
<td>12</td>
<td>15</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Production</td>
<td>530</td>
<td>840</td>
<td>970</td>
<td>850</td>
<td>1200</td>
<td>1300</td>
</tr>
<tr>
<td>Imports</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Supply</td>
<td>569</td>
<td>847</td>
<td>982</td>
<td>865</td>
<td>1210</td>
<td>1319</td>
</tr>
<tr>
<td>Exports</td>
<td>205</td>
<td>430</td>
<td>550</td>
<td>423</td>
<td>911</td>
<td>950</td>
</tr>
<tr>
<td>Industrial Use</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Food</td>
<td>345</td>
<td>380</td>
<td>400</td>
<td>417</td>
<td>270</td>
<td>339</td>
</tr>
<tr>
<td>Other uses</td>
<td>2</td>
<td>15</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Domestic Consumption</td>
<td>357</td>
<td>405</td>
<td>417</td>
<td>432</td>
<td>280</td>
<td>349</td>
</tr>
<tr>
<td>Ending Stocks</td>
<td>7</td>
<td>12</td>
<td>15</td>
<td>10</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>


Figure 13.4 shows that before the 23% export tax was implemented, the domestic sunoil price was significantly higher than the world price. Since implementation of the export tax, domestic sunoil prices have fluctuated in line with world market prices. Some imports occurred in 1998/99, but Ukraine was a net exporter over the entire period in question (see table 13.2). As figure 13.4 shows, sunoil production peaks in September-May, i.e. during and after the harvest period. Currently, crushers sign contracts with producers and purchase most sunseed from October till January. Independent traders also participate on the market, purchasing sunseed from producers or through elevators and then selling it to crushers.

The total oilseed crushing capacity in Ukraine is currently estimated at 3.9 mill. tonnes. Sunseed is processed by more than 200 enterprises in Ukraine, but 19 large sunseed processors united in the Association of Ukrainian Sunflower Seed Crushers UkrOliyaProm account for 85% of total vegetable oil production. The remaining 15% is produced by small-scale processing enterprises with low capacities and outputs.

Although crushing costs in Ukraine were very high in international comparison in the 1990s (see above), they have since fallen. For 2001/02, the FAO reports average costs of 20-40 US$/tonne, which is approaching Western European levels of efficiency. Of course, if (at least some and particular the largest) crushers have become cost-competitive, the rationale for the export tax becomes questionable. In this case the tax simply provides efficient domestic crushers with windfall profits, in economic terms ‘rents’.
A by-product of sunoil production is sunflower meal (sunmeal), a livestock feed. Production of sunmeal has also increased over the years (table 13.3). The protein content of sunmeal is 35-37%, but sunmeal is not considered as good a source of protein for livestock as, for example, soybean meal. The development of the poultry meat industry in Ukraine may lead to an increase in domestic demand for sunmeal.

Table 13.3: Sunmeal balances in Ukraine

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crush</td>
<td>1300</td>
<td>2100</td>
<td>2330</td>
<td>2070</td>
<td>2800</td>
<td>3200</td>
</tr>
<tr>
<td>Beginning Stocks</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Production</td>
<td>520</td>
<td>850</td>
<td>950</td>
<td>820</td>
<td>1150</td>
<td>1300</td>
</tr>
<tr>
<td>Total Supply</td>
<td>520</td>
<td>850</td>
<td>950</td>
<td>820</td>
<td>1150</td>
<td>1300</td>
</tr>
<tr>
<td>Exports</td>
<td>190</td>
<td>338</td>
<td>600</td>
<td>597</td>
<td>848</td>
<td>950</td>
</tr>
<tr>
<td>Feed use</td>
<td>330</td>
<td>510</td>
<td>350</td>
<td>223</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>Total Domestic Consumption</td>
<td>330</td>
<td>510</td>
<td>350</td>
<td>223</td>
<td>300</td>
<td>350</td>
</tr>
</tbody>
</table>


3 Possible justifications for the oilseed export tax

The aim of this chapter is to scrutinise the plausibility of several arguments in favour of the oilseed export tax. We first consider the so-called infant industry argument, whereby...
the Ukrainian crushing industry needs temporary help so that it can attract investment and become competitive. We then analyse the claim that Ukraine has market power in the world market for sunseed, which opens the possibility of an optimal export tax.

A last argument should not go unmentioned. Some advocates of the export tax claim that many regions in Ukraine already produce too much sunseed from an agronomic perspective, which has detrimental effects on soil fertility and long-term productivity. According to this argument, the tax may hurt farmers, but it is for their own good. Aside from the fact that this is a rather paternalistic argument, it certainly does not justify taxing all sunseed farmers in the country, regardless of their crop management skills. Furthermore, policy makers should ask themselves whether the excessive production of sunseed is not due to excessive direct and indirect taxation of other crops, which forces farmers to (over)produce the only crop that is a reasonably dependable and intervention-free source of cash revenues.

3.1 The infant-industry argument

The so-called infant industry argument claims that an industry needs certain duration of public support in order to become internationally competitive. It has been used to justify industrial protectionism in the 19th century in the USA and Germany, and more recently import-substitution policies in developing countries. The subsidisation of the European aircraft industry (Airbus) is another example of subsidisation which is designed to help an industry to emerge and become competitive. The core of the infant industry argument is that a domestic industry cannot become competitive because its costs are too high initially, even though they could be lower and competitive in the long run. This may be due to economies of scale or other barriers to market entry (e.g. know-how or monopoly power of competitors). Potential competitiveness is seen as justifying initial protection of the domestic industry to help it ‘over the hump’ until it can withstand competition on its own. The initial protection may lead to welfare losses in the short run, but it is assumed that these are outweighed by the long run benefits generated by the competitive industry later on.

In our context the sunseed crushing industry is the ‘infant’, and support is provided in the form of low-priced raw materials (sunseed) due to the 17% export tax on oilseeds. Oilseed crushers in Ukraine were inefficient and operating under capacity in the 1990s, while huge amounts of sunseed were exported to be crushed abroad. Under these circumstances, the justification for an export tax sounds compelling: the state supports a struggling industry, helps to maintain jobs and keep value added in Ukraine, and attracts FDI, and all this at virtually no cost to the national economy.

While these arguments do sound compelling, the following points should not be overlooked:

- First, the oilseed export tax does create very real costs in the form of significantly reduced revenues for domestic sunseed producers. Given a world price of 250 US$/tonne, the 17% export tax on oilseeds means that producers get 42.5 US$/tonne less than they otherwise would. Sunseed production averaged 3.05 mill. tonnes between 1998 and 2004 (table 13.1), so a simple ‘back of the envelope’ calculation shows that total annual losses to sunseed producers due to the tax amount to roughly 130 mUS$ or 700 mUAH (see the detailed simulation results
in section 4). Policy makers in Ukraine constantly stress that they are committed to supporting farmers, but the oilseed export tax tells a very different story.

- Second, it was pointed out above that as early as 2001/02, domestic crushing costs had fallen considerably compared with the mid-1990s. As investment has continued, the current competitiveness of the crushing industry in Ukraine will be even stronger. The ‘infant’ has grown up and should stand on its own feet now. Hence, if there ever was a justification for infant industry support, that justification is no longer valid.

Indeed, the fact that the oilseed export tax continues to be applied is a classic example of what economists call ‘rent-seeking’. Firms that receive infant industry support get accustomed to this support and work to maintain it long after they stop needing it. The irony of the situation is that the support that they receive – the so-called rents – are a very convenient source of money that can be used to legally – and perhaps even illegally – persuade policy makers to maintain the flow of support. This is perhaps the most important reason why many economists are so sceptical of the infant industry argument; even in cases where it does seem economically plausible, it is likely that it will be misused.

3.2 The market-power argument

Import tariffs tax the consumer to the benefit of producers and the budget, and export taxes burden producers and benefit consumers and the budget. What both have in common is that the losses outweigh the benefits, leading to a net welfare loss for the country as a whole. According to the theory of optimal tariff setting, however, a country with a large share in world trade can increase its welfare by setting import or export taxes (CORDEN, 1997). When an importer imposes an import tariff, domestic prices will rise and domestic demand will fall. If the importer is large, the fact that it demands less from the world market will depress the world market price. The resulting reduction in the price of its imports can outweigh the welfare losses induced by the tariff, provided that the tariff is set at a rate equal to the inverse of the world supply elasticity. In the case of a large exporter, this mechanism works in the opposite direction, and overall welfare is maximised at an export tax rate $te$ (ad-valorem of the f.o.b. price) that is given by:

$$te = \frac{-1}{\eta^w} \cdot s_{EXP}$$

where $\eta^w$ is the price elasticity of world import demand, and $s_{EXP}$ is the exporter’s world market share.

If we apply this to Ukraine’s sunseed exports, $s_{EXP}$, according to FAO figures, averaged 16.6% between 1995 and 2002. Assuming that the price elasticity of world import demand equals -1.5, Ukraine’s optimal export tax would equal 11.1%. However, the instability of Ukrainian sunseed yields caused $s_{EXP}$ to range from 2.5% in 1995 to 25.7% in 1997. In the former year the optimal export tax would have been 1.7%, in the latter 17.1%. Obviously, a tax that is calculated using the average market share will be too low in years of large export surpluses, and too large in years of small export surpluses.

The problem, as WARR (2001) demonstrates, is that the welfare losses that result from setting an ‘optimal’ tax too high by far outweigh the welfare gains that are realised when the tax is set too low. In other words, ‘getting it right’ on average is not good enough and will lead to net welfare losses. Since Ukraine’s sunseed production fluctuates
considerably and cannot be estimated with any accuracy until well after the harvest and exports have begun, determining a truly optimal export tax is next to impossible (even if we make the very heroic assumption that it is possible to obtain perfectly accurate forecasts of the other critical ingredients in equation (13.1), namely the elasticity of world import demand and the levels of competitors’ exports"). Therefore, attempts to apply an optimal export tax on Ukraine’s sunseed exports will most likely lead to net welfare losses rather than gains, and the optimal export tax argument is not a convincing justification for Ukraine’s current oilseed policy. This is especially true given that Ukraine appears destined to become a net importer of sunseed in the 2004/05 marketing year. In a net import situation, consideration of optimal export taxes is a purely academic exercise.

4 Empirical assessment of the oilseed export tax

4.1 A simulation of policy options

Cutting or abolishing the oilseed export tax is currently being debated in agricultural policy circles in Ukraine. The Association of Ukrainian Sunflower Seed Crushers UkrOliyaProm has instead proposed the introduction of a production subsidy for farmers that would compensate them for the losses that they incur as a result of the export tax. According to this proposal, crushers would continue to benefit from low priced sunseed due to the export tax, while production subsidies would ensure that farmers continue to produce enough sunseed to keep crushers operating at capacity. As crushing capacities have grown in recent years (presumably due to the protection afforded by the export tax), ensuring sufficient supply of sunseed has become a concern. After all, if Ukraine had to become a net importer to satisfy capacities in the crushing industry, sunseed prices would jump considerably from FOB to CIF levels.

In this section we use an agricultural sector model (RASMU, Regional Agricultural sector Model for Ukraine, see KUHN, 2004) to assess the economic costs and benefits of these policy alternatives. The following scenarios have been simulated using RASMU:

- The base (status quo) scenario with the 17% export tax;
- Scenario I without the 17% export tax; and
- Scenario II with the 17% export tax and compensation of farmers with a production subsidy.

The simulation results are displayed in table 13.4. For reasons of the availability of regional statistical information, RASMU has been calibrated to reflect an average of the situations in the years 2001 and 2002.

2 Information on competitors’ exports is required to calculate sEXP.
3 See e.g. UKRAGROCONSULT, Agrinews No. 40 (2004).
4 Curiously, it would appear that the proponents of the oilseed export tax have forgotten their old argument that production of sunseed should be reduced for agronomic reasons!
Table 13.4: Simulation results for the sunseed and sunoil sectors

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>Scenario I</th>
<th>Change from I to Base (%)</th>
<th>Scenario II</th>
<th>Change from II to Base (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17% export tax</td>
<td>No export tax</td>
<td>17% export tax plus prod. subsidy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunseed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area in 1000 ha</td>
<td>2613</td>
<td>3000</td>
<td>14.8</td>
<td>3015</td>
<td>15.4</td>
</tr>
<tr>
<td>Production, thd. tonnes</td>
<td>2961</td>
<td>3399</td>
<td>14.8</td>
<td>3416</td>
<td>15.4</td>
</tr>
<tr>
<td>Processing, thd. tonnes</td>
<td>2014</td>
<td>1536</td>
<td>-23.8</td>
<td>2014</td>
<td>0.0</td>
</tr>
<tr>
<td>Net trade (export), thd. tonnes</td>
<td>840</td>
<td>1772</td>
<td>111.0</td>
<td>1291</td>
<td>53.7</td>
</tr>
<tr>
<td>Producer price, US$/tonne</td>
<td>192</td>
<td>235</td>
<td>22.6</td>
<td>237</td>
<td>23.6</td>
</tr>
<tr>
<td>Market price, US$/tonne</td>
<td>192</td>
<td>235</td>
<td>22.6</td>
<td>192</td>
<td>0.0</td>
</tr>
<tr>
<td>Producer surplus, mUS$</td>
<td>138</td>
<td>144</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunoil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production, thd. tonnes</td>
<td>951</td>
<td>725</td>
<td>-23.8</td>
<td>951</td>
<td>0.0</td>
</tr>
<tr>
<td>Dom. consumption, thd. tonnes</td>
<td>472</td>
<td>472</td>
<td>0.0</td>
<td>472</td>
<td>0.0</td>
</tr>
<tr>
<td>Net trade (export), thd. tonnes</td>
<td>479</td>
<td>253</td>
<td>-47.2</td>
<td>479</td>
<td>0.0</td>
</tr>
<tr>
<td>Producer margin, US$/tonne</td>
<td>155</td>
<td>63</td>
<td>-59.4</td>
<td>155</td>
<td>0.0</td>
</tr>
<tr>
<td>Domestic price, US$/tonne</td>
<td>468</td>
<td>468</td>
<td>0.0</td>
<td>468</td>
<td>0.0</td>
</tr>
<tr>
<td>Producer surplus in mUS$</td>
<td>-77</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Including subsidy payments in scenario II.
Source: RASMU simulations.

When the export tax is abolished (scenario I), area and output of sunseed increase due to higher producer prices, while production of sunoil falls due to the reduction in the processing margin. As long as sunoil is exported, its domestic price remains tied to the world market price and, thus, unchanged. This is why consumers are not directly affected by the elimination of the export tax. As domestic processing of sunseed falls, exports of sunseed increase and exports of sunoil decrease. However, the latter remain significantly positive.

If the export tax is maintained but farmers receive a production subsidy per tonne of sunseed (scenario II), sunseed area and output react more or less as in scenario I; eliminating the export tax or compensating for it have the same basic impact on farmers. The difference between scenarios I and II, of course, is that in the latter the crushing industry continues to benefit from artificially inexpensive sunseed, and there are no changes in sunoil production and exports, etc., compared with the status quo.

Comparing the results of the two policy alternatives, one might conclude that scenario II is superior to scenario I, as it makes farmers better off while leaving crushers unaffected. However, so far our calculations have ignored the taxpayer, i.e. the rest of the national economy. In table 13.5 we see that budget expenditures increase in scenario I as export tax revenues are lost. But they increase much more in scenario II to cover the costs of the production subsidy. This increase more than compensates for increased export tax revenues in scenario II (due to increased sunseed exports). Altogether, eliminating the export tax produces an annual net welfare gain of roughly 24 mUS$, with sunseed
producers gaining 138 mUS$, crushers losing 77 mUS$ and taxpayers losing roughly 36 mUS$.  

Table 13.5: Overall welfare changes compared with the base scenario (mUS$)

<table>
<thead>
<tr>
<th>Scenario I (abolishing the export tax) versus base</th>
<th>Scenario II (17% export tax plus production subsidy for farmers) versus base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed users</td>
<td>-9.89</td>
</tr>
<tr>
<td>All producers and processors</td>
<td>70.22</td>
</tr>
<tr>
<td>Consumers</td>
<td>-10.05</td>
</tr>
<tr>
<td>Taxpayers (budget)</td>
<td>-36.34</td>
</tr>
<tr>
<td>Total national welfare</td>
<td>23.82</td>
</tr>
<tr>
<td>Northern regions</td>
<td>-5.76</td>
</tr>
<tr>
<td>Western regions</td>
<td>-7.74</td>
</tr>
<tr>
<td>Central regions</td>
<td>13.36</td>
</tr>
<tr>
<td>Southern regions</td>
<td>23.96</td>
</tr>
</tbody>
</table>

Source: RASMU simulations.

In the final analysis, simply abolishing the export tax and paying a subsidy per tonne of sunseed directly to the crushers would have the same impact as maintaining the tax and paying a subsidy per tonne of sunseed to farmers. Of course, crushers have proposed the latter option and not the former, because a subsidy to crushers that is disguised as support to farmers is much easier to sell politically.

*RASMU* also offers a view on the regional distribution of welfare changes. Table 13.5 demonstrates that the Centre and South of Ukraine would gain most from either policy change. North and West – where neither sunflower seed nor oil is produced in major volumes – are hardly affected directly. However, the North and West lose indirectly when we consider the reduction in export tax income for the public purse on a per capita basis. However, losses in these regions are more pronounced if the production subsidy is introduced, as the budget cost of this subsidy must also be distributed on a per capita basis, and this amounts to more than the export tax revenues.

Note that these calculations do not consider the administrative costs of collecting taxes and paying subsidies, etc. The combined export tax/producer subsidy proposal made by *UkrOliyaProm* would involve the most administration and, hence, the highest costs of all the scenarios considered above, especially since the producer subsidy would have to be applied at the farm level which would involve a great deal of bureaucracy (and presumable give the authorities yet another lever and excuse for interfering in farm management decisions).

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5 Introducing the compensating subsidy also leads to a welfare gain (almost 10 mUS$ compared to the current situation). This is due to the fact that the distortion on the sunseed supply side is eliminated by compensation payments, while sunseed crushing remains distorted. In a sense, the compensation payments act as a sort of second-best correction of a small part of the distortions caused by the export tax.
4.2 Impact on international trade relations

As swift accession to the WTO is a broadly accepted policy goal in Ukraine, the question arises as to whether Ukraine’s trade regime is broadly in line with WTO rules. Surprisingly, export taxes are not explicitly ruled out by the WTO, as the disciplines on this instrument are not clearly defined (OECD, 2003; PIERMARTINI, 2004). There are several explanations for this:

- Most industrialised countries have bilateral or regional agreements with each other which ban the use of export taxes. Therefore there has been no pressing need to take this issue before the WTO so far.
- Industrialised countries rarely have dominant positions on world markets for raw products that could be taxed in a reasonable way. Moreover, the farm lobbies in the OECD countries would not tolerate export taxes on agricultural commodities.
- Many developing countries rely to a considerable extent on export taxes applied to raw commodities such as cocoa, etc., because their fiscal systems are too weak to allow proper taxation of incomes or sales, etc. As developing countries are granted many exceptions under the WTO, there is no formal pressure on them to abandon their export taxes.

Hence, if Ukraine were a member of the WTO already, it would probably not encounter problems related to its oilseed export tax. However, matters are different for countries that apply for WTO membership. As pointed out in a report by the OECD (2003), Russia is currently under pressure to either schedule or eliminate export taxes on various raw materials. Similar disciplines were imposed on China as a precondition for accession. Ukraine’s WTO accession would thus probably require a plan to phase out its export taxes.

5 Conclusions

In the five years that the oilseeds export tax has been in force in Ukraine, significant investment into oilseed processing (crushing) capacities has taken place. In effect, farmers have paid for a considerable share of these investments, as they have received lower prices for their sunseed, leading to roughly 130 mUS$/year in reduced revenues. Only the lucky coincidence of rising world market prices for sunseed has prevented this policy from turning into a disaster. Nevertheless, the oilseed export tax is a tax on agricultural production and, as such, contradicts the repeated claims by policy makers in Ukraine that their top priority is helping farmers.

We therefore recommend that the oilseed export tax be phased out over a period of at very most three years. The crushing industry’s proposal to maintain the export tax and subsidise sunseed producers is not a reasonable alternative. Indeed, it would actually represent a continuation of the current subsidy to crushers, disguised as support for farmers and paid for by taxpayers. Many crushers in Ukraine, especially the ‘big players’, have heavily invested in new capacities and more efficient technologies in recent years. They are internationally competitive and ideally located in one of the world’s major sunseed production regions and close to important import markets. Hence, they should be able to stand on their own and no longer need support from farmers and/or taxpayers in Ukraine.
6 References

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14 The 2003 Wheat Crisis and Food Security

VIKTORIYA GALUSHKO, ARNIM KUHN & OLEG NIVYEVSKIY

1 Introduction

While Ukraine harvested roughly 20 mill. tonnes of wheat in both 2001 and 2002, the harvest in 2003 yielded only about 5 mill. tonnes. Assuming that the average production of wheat is 16 mill. tonnes and the average wheat price in Ukraine is about 105 US$/tonne (derived from a world market price of 155 US$/tonne), this was equivalent to an economic loss of 1.16 bUS$ (6.16 bUAH), or approximately 2.5% of Ukrainian GDP.\(^1\)

There is no way to make such a loss simply ‘disappear’. It was not the fault of bureaucrats, politicians, grain traders, farmers, consumers, or evil foreign powers, but rather solely attributable to bad weather conditions during the 2002/2003 winter. What matters in such a situation is how the economic damage is distributed, and what groups of the society should be protected from excessively severe consequences, since bread made from wheat is an important staple food for poor people in Ukraine.

In times of food shortfalls and escalating food prices, food relief for vulnerable groups is especially important. Competitive well-functioning markets are the most efficient mechanism for ensuring food availability and protecting low-income consumers during periods of food crisis. However, many policy makers in Ukraine seem to be convinced that markets alone do not react appropriately, or react too slowly, and that administrative intervention is therefore necessary. Even though government interference on Ukrainian food markets was reduced during the initial reform period in 1999-2000, the government remains an important player on food markets in times of ‘crisis’.

To guarantee low prices and the availability of staple foods to consumers following the bad harvest in 2003, the Ukrainian government intervened directly by setting price ceilings for staple foods, by regulating the profitability of food-producing enterprises and the mark-ups of retail stores, and by providing subsidies to bread producers. Unfortunately, these policies are inefficient and often even ineffective in protecting poor consumers, and they undermine important market mechanisms that would otherwise contribute to improving the situation. What use is it to a poor consumer that bread prices are kept low when the size of the bread loaves sold in the shops shrinks, or private bakeries close down because they cannot operate profitably any more, leading to supply shortages reminiscent of the times of the planned economy?

Instead, three things had to happen in response to such a shortfall in domestic wheat production:

1. Enough wheat had to be imported in order to meet at least food wheat demand.
2. Wheat prices had to increase in order to make imports profitable; and,

\(^1\) Even worse, the imports necessary to cover the domestic food wheat deficit are estimated at 4 mill. tonnes of wheat at import parity prices of at least 190 US$/tonne EXW. This sums up to 760 mUS$ or 4.05 bUAH, which was equal to 7% of the Ukrainian state budget for 2004.
3. Poor consumers should have been compensated for higher prices to a certain extent and in a targeted manner.

In this chapter we discuss these issues and the question of food security in Ukraine. The chapter is organised as follows. First, we discuss the probability of a deficit situation in Ukraine such as the one experienced in 2003. Then, the risk profiles of groups exposed to under-nutrition in Ukraine are presented. In section 4 we provide some evidence on the effectiveness of public food security measures, and evaluate Ukrainian food policy against this background. In the final section we discuss alternatives to the policies that were pursued following the bad harvest in 2003. The chapter closes with concrete recommendations and a brief epilogue on how the wheat crisis ended in 2004.

2 How likely is a food wheat deficit in Ukraine?

There can be no doubt that the wheat production shortfall caused by winterkill in early 2003 followed by drought in many regions of the country was serious, and it is natural to think about measures to ease the economic impact of such a shortfall. The ensuing grain deficit was absolute in a sense that production plus stocks could not even cover human consumption needs, let alone feed and other uses. When considering policy responses to such a situation its frequency or likelihood should be taken into account. If similar deficits could be expected to occur every three years, a permanent intervention mechanism to stabilise markets could be more easily justified economically (given that market participants are risk-averse) than if they could be expected to occur only two or three times in a century.

Figures 14.1 and 14.2 put things into perspective for grain in general and wheat, the most important staple crop for human consumption, respectively. Figure 14.1 shows that Ukraine experienced an overall grain deficit in seven out of the 42 years under consideration. On average, the deficit was 2.2 mill. tonnes; one each occurred in the 1960s, the 1990s, and in 2003; and four occurred between 1979 and 1983.

The following conclusions can be drawn:

- The probability of a deficit is one in six years during the observed period.
- There is no indication that the probability of grain deficits is increasing, despite the overall reduction in production that has accompanied transition.
- The average size of a deficit is such that public emergency reserves of roughly 2 mill. tonnes could (at least theoretically) prevent serious overall grain shortages; and,
- The elastic component of grain demand is presumably feed demand, through which consumption adapts to production.
For wheat in particular (figure 14.2), the number of deficits is lower over the period in question if we define a food wheat deficit as a situation in which wheat production falls short of wheat consumption for food purposes, i.e. total consumption minus feed use. Two wheat deficits between 1961 and 2003 made imports of food wheat into Ukraine absolutely necessary; in 1963 and 2003. The conclusions are as follows:

- True food wheat deficits are relatively seldom.
- Grain and wheat demand adjust to changing conditions through decreased feed use of grains and wheat in particular. Feed use therefore acts as a ‘hidden grain silo’.
- To the extent that a wheat deficit can be offset by a reduction in feed use and the substitution of feed wheat by other feedstuffs, food wheat imports are not necessary.
- Prices for food wheat need not increase to the import parity price level (world market price plus tariff, transport costs from port to elevator, etc.) in the event of a poor harvest as long as feed wheat is available to be substituted.
- Public wheat storage is not necessary to keep prices within a tolerable range as long as production plus existing private stocks are higher than food consumption; and,
- Major public stocks of food wheat would be useful only once every 25 years on average. It is questionable under these circumstances whether the costs of extensive public storage are justified, given the long average periods over which grain would have to be stored for no use.

In summary, there would appear to be more justification for feed grain storage than for food grain storage in Ukraine.
3 Food security: The identification of vulnerable groups

Food security cannot be measured in a meaningful way at the national or regional level. Even if a country is a net exporter of food, some vulnerable low-income groups within the population might still suffer from malnutrition. Thus, adequate grain production in a certain region is neither a sufficient nor a necessary condition for the food security of all households and individuals in that region. The food security of an individual crucially depends on his or her endowments, working capacity and other production factors, and his or her exchange entitlements, i.e. the ability to exchange these endowments for food. Hence, food security can be endangered by a decrease in a person's endowment (e.g. loss of access to land, or loss of ability to work due to health problems), or due to an unfavourable shift in exchange entitlements caused by a loss of employment, a fall in wages, a rise in food prices – for which a bad harvest is just one possible reason –, a drop in the price of

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2 It was the pioneering work of Indian Nobel Laureate AMARTYA SEN in his book “Poverty and Famines – An Essay on Entitlement and Deprivation” (1981) that gave us a different and much broader view of the notion of food security. SEN introduced the so-called entitlement approach. According to this approach the food consumption of individuals, families or social groups depends on what they are able to acquire by whatever legal ways. Although this seems to be rather obvious, it had in the past all too often been forgotten in the analysis of the causes of under-nutrition. SEN demonstrated that some of the worst famines in history occurred in the midst of plentiful or at least sufficient production, and could not be attributed to production shortfalls at all.
goods or services the person sells, or a decline in self-production. The failure of any of these entitlements can threaten the food security of an individual or household.

What might characterise a vulnerable household in the Ukrainian context? It is obvious that poor people are more vulnerable to under-nutrition. But official poverty lines are mostly based on the concept of relative poverty. A household which is officially poor in Germany has still a real income that is far above the Ukrainian average. But what, then, are the characteristics of an absolute poverty level which makes household members vulnerable to under-nutrition? The following factors contribute to risk:

- Dependence on low wages or pension earnings: According to the Ukrainian law, there is both a minimum wage and a minimum pension. But it cannot be taken for granted that employees or pensioners always manage to really receive this amount. The results of the household surveys on which official statistics are based suggest that the lower income strata receive wages below the official minimum level.

- Members of households with only one earner: As a legacy of its socialist past, Ukraine has a high share of labour market participation. However, increasing unemployment and women ‘returning to the kitchen’ mean that an increasing number of households depend on single incomes. Single parent households are a related problem, because good nutrition and health also depend on care, especially for children.

- Children or elderly people without pensions in low-income households: The lowest income group in rural areas according to national expenditure statistics has the highest average number of household members (4.7). Most likely, these are households with children. Families with many children (or with elderly members who are not entitled for a pension for whatever reasons) thus face an increased poverty risk.

- Members of a household where the earner is jobless, or suffers from wage arrears: The level of unemployment in Ukraine is modest by international standards, which may be due to the low levels of unemployment benefits. Nevertheless, poor families with unemployed earners will tend to have difficulties mobilising the monetary resources for sufficient food. The same holds true for employees faced with wage arrears.

- Households in remote areas: Given that a production shortfall in a remote region makes imports of food necessary, the cost of shipping food to these areas may increase prices tremendously compared with a situation in which the region produces

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3 See STRIEWE et al. (2001).

4 The most common definition of a poor household in Germany is a household with an income level of less than one-half the average national monetary household income. This is far above the average income of a Ukrainian household. Social welfare programmes in Germany prevent net household incomes from falling below a certain level (roughly 1500 € per month). Hence, according to Ukrainian standards, there should be only rich households in Germany. Only a very small share of individuals earns less, particularly homeless people with mental disorders who simply do not manage to comply with the bureaucratic procedures of the existing social welfare system.
staple foods in sufficient quantities. Moreover, the transport of self-produced non-staples to the next market (where they can be turned into cash which then can be used to buy staples) is more costly.

- **Rural households without land titles among the members:** Lease payments from land shares of former collective or state farms constitute an important source of income for rural households. These lease payments are either paid in cash or in-kind, for example wheat⁵.

- **Households which have no access to a garden plot or dacha:** There are two major staple crops in Ukraine, wheat and potatoes. While wheat is produced predominantly on large farms, potatoes are typically produced in private gardens. The same is true for fruits, vegetables, and small livestock. The access to such a production resource still represents the most important insurance against food shortages that exists in Ukraine today⁶. Generally, it can be expected that it is the urban poor who are at a higher risk to have poor access to food, while the rural poor suffer more from lacking access to health service and education.

- **Individuals with low incomes and no support from relatives:** The family is still an important safety net for elderly or disabled persons. Grandparents often receive support from their working children or grandchildren, especially when their pensions are low or late. Pensioners without children or with disrupted family ties are at high risk. The typical beggar on Ukrainian streets is a female pensioner.

- **Poor households in poor regions with an under-developed system of social welfare:** It is obvious that poor households in poor regions run a higher risk of significantly depressed purchasing power for food. Moreover, poor regions often cannot afford sufficient welfare programs to protect the poor.

This list could be continued. The more of these characteristics an individual or a household combines, the more this household will be prone to nutritional problems. It is important to recognise that this is not only the case when there is a grain shortage in the region. According to official Ukrainian statistics for the year 2002 (a year with abundant grain and very low grain prices), individuals in the lowest income category (average expenditure per household member lower than 60 UAH per month) consumed only 1530 calories per day. Even if we account for the probability that there are small children among the members of these households, this nutritional level is insufficient. This is surprising, since chronic hunger does not seem to be an obvious problem in Ukraine. Only biometric measurements among the members of vulnerable groups can determine whether under-nutrition is a widespread fact and not simply a statistical artefact due to under-reporting of food intake during household surveys.

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⁵ In the case of a food shortage, payments in the form of wheat have the advantage that they are not dependent on the wheat price. However, it is likely that the tenant will try to reduce his lease payment obligations in the event of a harvest shortfall. Hence, the food security enhancing function of wage payments in kind may be less than expected.

⁶ THO SEETH et al. (1998) find that the access to a garden plot tremendously decreases the risk of extreme poverty for households in Russia.
Biometric studies that have been carried out in Ukraine in 1999 by UNICEF have shown that the most widespread malnutrition indicator among children was stunting, which means a reduced height for age. 15.4 percent of the children were classified as stunted by this study. But the reason for this is generally not a caloric deficiency, but rather weaknesses in feeding practices in young children. Ukraine still follows Soviet recommendations which underestimate the importance of breastfeeding in the early months of a child’s live (SEDIK et al., 2003). According to these authors, there are no further indications of widespread undernutrition in Ukraine. Only 5% of the population have inadequate diets due to deficient calorie intake.

From a political perspective, this finding is fundamental because it refutes the common notion that half of the population are so poor that they need low bread prices for survival. It is only a relatively small fraction of the population that is at risk, and this group also suffers when bread prices are low, and not just in years of shortage such as 2003.

4 Do existing policies help the poor?

The large share of food in total per capita expenditures in Ukraine engenders vulnerability not only in terms of ability to purchase food when it is available in the market, but also to price shocks and temporary downturns in income. In times of food shortfalls and escalating food prices, food relief is especially important for the most vulnerable households. To achieve its food security goals, the Ukrainian government has adopted a highly interventionist approach to grain markets and undertakes the following activities: releasing grain and staple food products from the State Reserve at subsidised prices, administering farm-gate and retail prices, fixing maximum profitability rates and maximum mark-ups for food-processing enterprises. Theses policies are all intended to ensure low food prices. However, given their economic costs, this set of policies is an extremely ineffective means of reaching and helping the poor. Because these policies ensure low food prices for all, and since the rich consume more of all food products than the poor, these policies yield more benefits to high-income population groups, while often providing an insignificant food relief to the poorest. This argument is briefly discussed in Box 1 below.
Box 1: Brazil’s experience with staple food subsidies

Between 1966 and 1982 the government of Brazil attempted to achieve self-sufficiency in wheat production and at the same time provide cheap wheat to its consumers. As part of its attempt to achieve these goals, the government became the sole seller and buyer of both domestically produced and imported wheat. The prices of wheat were rigidly controlled throughout the economy. Farmers were encouraged to increase wheat production through a price-support subsidy, and millers were provided with wheat at a price substantially below that paid to producers, with the government paying the difference out of the general budget.

In their study of the Brazilian wheat policy, CALEGAR & SCHUH (1988, p. 9-10 & p. 43-45) determined that 86% of the subsidy went to consumers, while 14% went to administration or were lost through slippages such as manipulations by the millers. Only 19% of the total subsidy went to the target group, the low-income consumers. Furthermore, gains in consumer welfare were slightly biased toward high-income consumers because they buy more bread per capita than low-income consumers.


4.1 Subsidising food through administered prices, profitability and mark-up controls

Policies such as explicit or implicit food subsidisation through government procurement (sales) programs and ceiling prices generally result in significant losses in economic efficiency and tend to be poorly targeted. Following the 2003 harvest, the government of Ukraine claimed that under the given fiscal constraints these policies were the only way to help the needy. But were these policies effective?

Figure 14.3 presents information on the correlation between the share of poor people in an oblast in Ukraine (we identify the poor as those living on less than 1 US$ a day) and the level of bread prices in that oblast, the latter often lowered by administrative orders. The positive value of the correlation coefficients between these two variables (r = 0.24) implies that, on average, bread prices were higher in those regions with a high poverty share in 2003. This is the exact opposite of what a rational policy aimed at helping the poor should achieve, and provides evidence that price control measures are an extremely poorly targeted food security policy7.

7 An especially bizarre case is the city of Kiev, where bread prices are among the lowest in the country, even though the share of poor people is only roughly 10%.
Figure 14.3: Correlation between the regional share of individuals living on less than 1 US$ per day and the regional bread price (in UAH/kg) in 2003

![Correlation graph]

Source: STATE STATISTICS COMMITTEE OF UKRAINE.

Implicit subsidisation of food through administered staple food and grain prices does not meet the objective of providing relief to the vulnerable groups. In table 14.1 below we provide estimates of bread, meat and milk consumption for different income strata in Ukraine.

Table 14.1: Bread, meat and milk* consumption by the poor and the non-poor in 2002

<table>
<thead>
<tr>
<th></th>
<th>Consumers living on less than 1 US$ per day</th>
<th>Consumers living on more than 1 US$ per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of consumers, mill.</td>
<td>9.2</td>
<td>39.1</td>
</tr>
<tr>
<td>Per capita bread consumption, kg/month</td>
<td>8.5</td>
<td>11.3</td>
</tr>
<tr>
<td>Bread consumption by the income stratum, tonnes/month</td>
<td>77951</td>
<td>442609</td>
</tr>
<tr>
<td>Per capita meat consumption, kg/month</td>
<td>1.4</td>
<td>2.9</td>
</tr>
<tr>
<td>Meat consumption by the income stratum, tonnes/month</td>
<td>13172</td>
<td>111746</td>
</tr>
<tr>
<td>Per capita milk consumption, kg/month</td>
<td>11.3</td>
<td>18.5</td>
</tr>
<tr>
<td>Milk consumption by the income stratum, tonnes/month</td>
<td>103063</td>
<td>721157</td>
</tr>
</tbody>
</table>

Note: * Bread includes rice, bread, bakery products, flour and cereals; milk includes fluid milk, cheese and butter measured in milk equivalents

Source: Own calculations on the basis of STATE STATISTICS COMMITTEE OF UKRAINE.
As can be seen from the table, consumption of bread, meat and dairy products increases with income. The poor account for 19% of the total population, but 15% of total bread consumption, and only 11% and 13% of meat and milk consumption, respectively. This means that keeping prices for bread, flour and cereals low yields much larger benefits to high-income population groups, and that only a small share of the total food subsidy generated by price controls goes to the poor. Furthermore, the benefits of cheap feed grain largely end up with the wealthy who consume most of the livestock products.

Restricting mark-ups in rural stores can be especially harmful for the rural poor. Due to poor infrastructure, the cost of transporting products is rather high, which is translated into higher retail mark-ups. Limiting the mark-up to a level that makes transportation unprofitable cuts rural residents off from food supplies and forces them to incur additional costs by travelling to neighbouring centres for bread, pasta and other foods or by buying products on informal markets at much higher prices. Thus, the rural poor can end up paying more than they would without the government policy. Further, to ensure that profitability or a mark-up does not exceed the legislatively set level, the government is obliged to organise permanent inspections, which means that the government bureaucracy controlling prices tends to get bigger, more intrusive and more expensive.

Another question that arises is: Were administrative controls over bread, cereals and grain prices really necessary following the poor harvest in 2003? The situation in 2003 and early 2004 can be compared with the situation that occurred in 2000, when the harvest was poor and milling wheat prices increased by 2.1 times. In response to the grain price increase in 2001, retail prices for bread, meat and dairy products increased by 67%, 45% and 35%, respectively. Nevertheless, there was no threat of food insecurity and significant impoverishment of the population. Assuming an increase of bread prices by 67%, and given the share of bread in total consumer expenditures, we can estimate that total consumer expenditures must have increased by roughly 6.6%, which is not negligible, but also not drastic (table 14.2). Price controls can reduce this increase, but in an un-targeted manner as demonstrated above, and only at the cost of creating a dual market for grain and increased incentives for shadow market activity.

Table 14.2: The increase in consumer expenditures due to a 67% bread price increase

<table>
<thead>
<tr>
<th>Impact on consumers</th>
<th>Average consumer</th>
<th>Poor consumer (less than 1 US$/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of food expenditures in total expenditures</td>
<td>65.0%</td>
<td>70.0%</td>
</tr>
<tr>
<td>Share of bread in total food expenditures</td>
<td>8.8%</td>
<td>14.0%</td>
</tr>
<tr>
<td>Increase in food expenditures</td>
<td>5.9%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Increase in total expenditures</td>
<td>3.9%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

Source: Own calculations.

4.2 Subsidising food through non-competitive procurement of grain from farmers

In addition to direct price controls the Ukrainian government undertook a number of measures following the harvest in 2003, including non-competitive procurement of grain from farmers to replenish regional reserves and restrictions on interregional grain shipments. Enforced procurement of grain from farmers at below-market prices represents an implicit taxation of farming that reduces the incentives to produce grain. It also renews
mistrust in grain interventions by the government so that other policy instruments such the pledge price system have even less chance of being accepted by farmers. Policy-makers would be well advised to bear in mind that “the price paid for cheap food today is a lethargic agricultural performance tomorrow”.

4.3 The role of interregional barriers to grain movements

Placing controls on interregional grain shipments has become a common practice to increase a region’s self-sufficiency and control over grain movements and use. However, such controls create wedges between regional grain prices by increasing prices in importing regions and reducing prices in exporting regions. In Ukraine, for example, the Western regions are the poorest and they are net importers of grain. This means that by restricting interregional grain movements the government effectively increases grain prices in the Western regions, thus making food less affordable to the poor. The costs of interregional trade barriers can run very high as illustrated in box 2.

Box 2: Inter-provincial barriers to trade in Canada

There are many barriers to agricultural and non-agricultural trade between the provinces in Canada. Due to the Canadian Agricultural Product Standards Act, for example, Alberta-based fruit and vegetable companies could not make bulk shipments of carrots for processing in British Columbia, Saskatchewan and Manitoba. Under the National Farm Products Marketing Agencies Act, inter-provincial movements of chicken, turkeys, eggs and milk were regulated through quota systems. Inspection regulations and enforcement practices also served as impediments to inter-provincial trade. The costs of such impediments are magnified beyond the farm gate. For example, barriers to the free movement of raw commodities require the processing sector to operate smaller, less efficient plants, which is translated into higher prices to consumers. By contrast, a policy of maintaining an open common market would strengthen competition between regional agricultural and food producers, which would manifest itself in lower food prices and higher per capita incomes. It has been estimated that inter-provincial barriers overall cost Canadians at least 6.5 bill. Canadian dollars in lost income annually, while the potential gains from freeing internal trade in Canada are estimated to be equivalent to a permanent increase in income of 1.5%.

Source: PALDA (1994).

5 Public action to protect vulnerable groups: What can be done?

In the following we discuss a set of more effective and more efficient policies for relieving the hardship of the poor in years of bad harvest. One has to distinguish between short run, emergency measures, and long run measures.

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5.1 Short run measures

5.1.1 Food subsidies for poor people

One of the common means to provide immediate relief to the most vulnerable groups in times of food shortfalls is a subsidised food-rationing system or food stamps that allow a consumer to purchase a specific amount of specified food at a below-market price. Since in urban areas it is mostly pensioners who are poor, pension payments could be supplemented with discount coupons. In rural areas identification of the poor is more difficult and would require greater effort on the part of the authorities.

How costly would such a policy be? According to official statistics, calorie intakes are below the norm in households with less than 120 UAH per capita monthly income. These are the households that should therefore be targeted. Given that there are 4.6 mill. people belonging to the 30-120 UAH income group, and assuming that the government subsidises the bread price by 0.3 UAH/kg (with a monthly bread consumption of 8.1 kg per capita), government expenditure on food stamps would be about 11.2 mUAH per month \[4.6 \times 0.3 \times 8.1\]. If administrative costs added 10% to these costs, the food stamp program would cost Ukrainian taxpayers about 12.3 mUAH per month altogether. Is this cost too high? Let us compare it with an alternative means of keeping bread prices low that was considered by the government in 2003: the elimination of VAT on bread. The elimination of VAT would have reduced bread prices by 0.08 UAH/kg. Assuming a total monthly bread consumption of 286 thd. tonnes (each Ukrainian consumes daily 200 grams of bread on average), the budget would have foregone VAT revenues of approximately 23 mUAH per month \[286 \times 0.08\]. Thus, targeted food relief would have cost the government only half as much as a policy of ensuring low bread prices for all by eliminating VAT on bread. Even though the elimination of VAT may have appeared to be a reasonable policy to keep bread prices low because it does not involve explicit payments from the budget as the food stamp program does, in reality it costs considerably more.

5.1.2 Subsidies to inferior staple foods

Another way to reach the target group is to use what is referred to as a self-targeting policy. An example of such a policy is the subsidisation of foods that are characterised by a negative income elasticity of demand. For example, the government could subsidise the kinds of bread (low-quality bread) that tend to be consumed only by the poorest and are not consumed by consumers in higher income categories.

5.1.3 Food-for-work programmes

To alleviate the hardship of the bad harvest and escalating prices for the unemployed, employment schemes such as food-for-work where workers are paid most of their wages in kind could be launched. Food-for-work measures tend to involve considerable administrative costs, however.

5.2 Long run strategies

To be effective, food rationing and food stamp programmes must be well administrated, which can be costly. Thus, even though these programmes can succeed in providing rapid relief to vulnerable groups, they should be considered short run measures, and priority should be given to other policies that contribute to food security in the long run.
5.2.1 Improving productivity in crop production

Looking at figure 14.2 it is evident that there have been large fluctuations in Ukrainian wheat production over the previous decades. A long-term goal should be to reduce such fluctuations, thus avoiding switches from an import to an export situation and vice versa. Since domestic production plays a major role in the food security of rural households, efforts to improve agricultural technology could have a significant positive impact on food security. Drought-resistant and high-yielding crop varieties could significantly reduce production variability, as could the use of low-tillage methods and other innovations. Investment in research and extension could help diversify production, which would reduce vulnerability to price shocks.

5.2.2 Improvement of rural infrastructure

Food grain price stabilisation policies should be implemented through marketing support services and infrastructure. Investments in transport infrastructure should be the most important component of price stabilisation policies, since improved transportation networks increase farm-gate prices (thus increasing farmers’ incomes), lower input costs (which is manifested in lower prices for consumers) and significantly contribute to a reduction of price fluctuations (which reduces the probability that low-income households will suffer from food insecurity following bad harvests). Furthermore, improved infrastructure increases off-farm employment opportunities, which translates into higher rural incomes, thus improving access to food by rural households.

5.2.3 Public reserves

Trade should be recognised as a potential instrument for increasing food security. At a first glance, holding reserves with a view to stabilising prices in lean years might appear to be a good solution. However, stock-outs in importing periods are unlikely to have a major impact on prices. Instead, they will simply substitute for commercial imports. Furthermore, releasing grains and food from the state reserve at below-market prices will discourage private traders’ and stockholders’ activities.

Instead of trying to play a major role in the grain marketing system the government should boost confidence and encourage the private sector to make the necessary efficiency enhancing investments in the marketing system. Ad hoc government intervention and uncertainty regarding its timing and impact discourage involvement by the private sector, thus contributing to market inefficiency and fragmentation. A government competition policy would also be critical to ensure fair trading practices by the private sector. Competition among domestic producers would stimulate the introduction of cost-reducing technologies, which would inevitably lead to increased supplies and reduced food prices.

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9 Chapter 11 Farm Management Challenges in Ukrainian Agriculture discusses how poor management such as excessively dense rates of seeding in crop production and poor seedbed preparation depress yields and profitability in good years and bad.

10 MARTINEZ et al. (2002).
6 Epilogue: How the wheat crisis ended in 2004

When the government in Ukraine became aware of the impending shortage of food grain, it promised to supply more than 2 mill. tonnes of low-cost wheat from intergovernmental agreements with Russia and Kazakhstan. When the promised quantities of (and prices for) this grain did not materialise, the government conceded that commercial imports would be necessary. In order to make these imports economically feasible, the government temporarily abolished the import duties on wheat and rye. As a result, Ukraine managed to import about 3.4 mill. tonnes of wheat, 0.15-0.2 mill. tonnes of flour, and 0.13 mill. tonnes of rye in the 2003/04 marketing year. Major suppliers of wheat into Ukraine were Kazakhstan (51%), Russia (26%), and Lithuania (8%).

In addition to various market interventions (e.g. fixed bread prices, maximal trade margins (5%) for bakeries, subsidised flour procurement etc.) the government of Ukraine also made an attempt to target its policy at the poor population. Under the recommendations of the Cabinet Ministers of Ukraine, direct income transfer programs were launched in some regions. The average amount of money transferred was about 6 UAH. For example, local authorities in Kharkiv allocated 1.5 mUAH for this purpose, which corresponded to 4.76 UAH per person and month. If we define all people living on less than 1 US$/day (160 UAH/month) as poor, we can easily calculate whether 6 UAH is enough to compensate for the bread price increase. As demonstrated in table 14.2, a 67% bread price increase translates into a 6.6% increase in total expenditures by the poor. Hence, to counteract this increase and maintain poor consumers’ real income, 10.4 UAH would be required. So the average of 6 UAH that was supplied was probably too little. Nevertheless, it is very positive that – after an initial phase of rather uncoordinated ‘actionism’ that involved much ineffective and even counterproductive market intervention – the government did begin to employ more efficient and targeted policies to cushion the poor and reduce the impact of the 2003 grain harvest on food security.

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11 GERMAN ADVISORY GROUP (2003).


15 The 2003 Wheat Harvest: Crisis! What Crisis?

Stephan von Cramon-Taubadel

1 Introduction

In early 2003 severe winterkill took its toll on grain crops. When this was followed by a prolonged drought in the late spring and early summer of that year, it became apparent that Ukraine was likely to become a net importer of food grain in 2003/04. Concern and alarm deepened when harvest data indicated that a total grain crop of perhaps 20 mill. tonnes had been harvested, down from about 36 mill. tonnes in 2002.

The situation was especially critical for wheat, with roughly 5 mill. tonnes harvested in 2003 as opposed to some 20 mill. tonnes in both 2001 and 2002. After exporting roughly 5.5 and 6.5 mill. tonnes of wheat in the 2001/02 and 2002/03 marketing years, respectively, it was estimated that Ukraine would have to import between 2.8 mill. tonnes (Ukrainian Grain Association) and 3.7 mill. tonnes (UKRAGROCONSULT) of food wheat in 2003/04. As a result, prices for food wheat in Ukraine exploded in mid-2003, surpassing world market prices as they had in 2000 and early 2001 when Ukraine was last a net importer (see figure 15.1).

How did policy makers respond to this situation? The Cabinet of Ministers of Ukraine issued Decree #1150 on July 24, 2003. This decree contained a variety of provisions including personal consequences (several policy makers were relieved of their duties or subject to investigations) as well as a call for a detailed inquiry by the Anti-Monopoly commission. It also empowered regional authorities to “thoroughly monitor food grain movements and prices on regional markets” and “to pay a closer attention to monitoring of staple food prices, mark-ups [and] profitability rates, and undertake measures to keep them from rising if there are no reasons for price increases” (Articles 28 and 33 respectively). Finally, it contained provisions for intervention purchases by the State Reserve Committee.

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1 There is considerable disagreement about grain harvest figures in Ukraine, past and present. Figures from UKRAGROCONSULT are used throughout this paper.

2 Today, we know that a total of 3.4 mill. tonnes of wheat was imported in the 2003/04 marketing year.
Decree #1150 was accompanied by the announcement of agreements to purchase grain from Kazakhstan and Russia as well as plans to introduce an export tax for feed grains. Traders reported that they were subject to intense scrutiny, and the press was full of rumours about new and intensified regulation of grain markets in Ukraine, including reports that the government intended to reintroduce the state order system3.

In the following we evaluate these measures with respect to two important criteria: 1) whether they were well-suited to relieve the current tensions on Ukrainian grain markets; and, 2) what impact they had on the overall direction of agricultural policy making in Ukraine.

2 Crisis! What crisis?

It was a fact that weather conditions devastated the 2003 harvest. Whether or not this amounted to a ‘crisis’ is a matter of semantics. For historical reasons, Ukrainians are understandably very attuned and sensitive to conditions in agriculture and especially grain production. On the other hand, food security in Ukraine was not fundamentally threatened in 2003. Despite what some saw as the worst crop weather of the last century, Ukraine’s

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3 See the Friday September 12, 2003 issue of Kiev Post Daily (p. 2), in which Agriculture Minister Serhiy Ryzhuk is cited as announcing government plans to “return to its previous system of crop management, whereby it instructs farmers to produce specific quantities of each agricultural commodity”
farmers succeeded in producing at least 20 mill. tonnes of grain. Furthermore, the current situation in Ukraine was not unique. The grain crop in Australia, for example, fell to 14.9 mill. tonnes in 2002/03 from 37.5 mill. tonnes in 2001/02, a reduction of just over 60%.

It is not our intention to downplay the gravity of the situation in 2003. However, given agro-climatic conditions in the country, it is clear that Ukrainian grain production was, is and will always be subject to fluctuations. When these occur, policy makers can help most by displaying a steady hand and not unsettling markets further. Unfortunately, the policy response to the 2003 grain harvest heightened the sense of crisis rather than lowering it. Some elements of this response contributed to an atmosphere in which rumours multiplied and individual policy makers and their institutions appeared to be trying to outdo each other in ‘crisis management’. Of particular concern is that this sense of crisis provided anti-reform forces with a pretext for the re-introduction of interventionist measures. As a result, it may be more appropriate to speak of a crisis in agricultural policy making in 2003 than of a ‘crisis’ in Ukrainian agriculture.

3 Evaluating the response so far

A recurring theme in the policy response to the 2003 harvest was that of individual responsibility. Policy makers at various levels were dismissed, and some were subject to criminal investigation. While there is no question that individuals should be held accountable for negligence and wrongdoing, the emphasis on individual responsibility with respect to the situation on Ukrainian grain markets in 2003 did considerable damage in two respects. First, it helped to sustain the myth that people can fine-tune markets. It suggested, falsely, that the right group of individuals pushing the right policy ‘buttons’ could have avoided the situation in 2003. In fact, there is nothing any individual or institution could have done to change weather conditions and significantly increase the 2003 harvest.

Second, the emphasis on personal accountability created an atmosphere in which bureaucrats, especially at the regional level, were very eager to appear ‘active’. Consider Article 28 of Decree #1150, which called on regional authorities to both “thoroughly monitor food grain movements and prices” and at the same time to “eliminate any administrative intervention impeding free grain movement…” Clearly, these instructions were contradictory. With the fate of their former colleagues who had been accused of failing to take appropriate steps in mind, most regional authorities who still had a job emphasised the first instruction and ignored the second. They monitored and controlled very closely, and in the process they did not eliminated but rather expanded and strengthened administrative intervention on grain markets.

As a result, the Ukrainian grain market was effectively fragmented into a collection of regional grain markets. In effect, by giving regional authorities both the power and the incentives to interfere, Decree #1150 effectively eliminated one of the most important mechanisms by which markets can help to absorb or dampen shocks such as a poor harvest. This mechanism is market integration, by which trade and arbitrage between regions can spread the impact of a shock evenly, ensuring that each regional market bears its share of the burden. It is somewhat ironic that Ukrainian policy makers were negotiating a common

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4 See Decree of the Cabinet of Ministry #475 on August 6, 2003 “On creation of the government working group for controlling of the situation on the food market”
market arrangement with other states of the Former Soviet Union in 2003, at a time when Ukraine was taking a big step away from being a common market itself, at least as regards grain.

The only direct policy intervention that might have helped to relieve pressure on food grain markets in Ukraine in 2003 would have been the accumulation of public or private stocks in 2001 and/or 2002. The fact that public stocks were not accumulated in these years is certainly not the fault of any of the individuals who were reprimanded or relieved of their positions. Stocking 2 mill. tonnes of milling wheat – enough to significantly relieve markets in 2003 – would have cost somewhere between 0.8 and 1.0 bUAH in the summer and fall of 2002 when prices ranged between 400 and 500 UAH/tonne. Handling as well as storage costs and losses would have added to this bill. However, despite repeated announcements made in 2001 and 2002 that the Strategic Reserve or other public institutions would accumulate stocks; the required funding was never made available. This was policy failure, not market failure.

The fact that private individuals and firms did not stock enough in the past to relieve markets 2003 also comes as no surprise. Farmers in Ukraine are generally cash-strapped and obliged to sell their crops as soon as possible after the harvest for liquidity reasons. So even if they had the required storage facilities, which they generally do not, they could not be expected to store large amounts of grain. As it is, private individuals or firms generally have no alternative to using public (Khlib Ukrainy) storage facilities, and these are known to be prohibitively expensive. Hence, failure to privatisate Khlib Ukrainy and foster competition on the market for grain storage services in the past reduced the ability of market mechanisms to absorb the shock of the bad harvest in 2003. Again, this was a case of policy failure, not market failure.

Since important reforms in late 1999 and 2000, private traders have begun to invest in grain storage and handling capacity in Ukraine. However, many actions by policy makers in response to the ‘crisis’ in 2003 unsettled traders considerably. Traders were subject to intense scrutiny and threats. For example, they were threatened with a punitive tax of 10% on the previous year’s profits if they did not supply food wheat for 900 UAH/tonne, a price which was certainly unrealistic in late 2003 (see figure 15.1). Some traders were told that their shipments of feed grain exports (for example barley) would only be cleared to leave Ukrainian harbours if the same ships return loaded with wheat within a certain period of time. Added to these specific forms of intervention, traders were confronted with rumours that the government intended to establish a Ukrainian monopoly grain trader. These panic reactions by policy makers threatened to undo the progress that had been made over the previous 3 years and scare off the most important source of new capital and know-how in the Ukrainian grain sector.

These considerations are pertinent to the unfounded allegations that ‘too much’ grain was exported ‘too quickly’ following the 2002 harvest. With no realistic option for storing their grain, farmers were happy to sell it as quickly as possible. The best prices were being paid by traders. The state could have purchased grain for storage itself, but as outlined above it routinely failed to fulfil its announced targets. The pledge price system introduced in 2002 could have helped some farmers withstand the pressure to sell their grain to traders right after the harvest, but this system, too, was under-funded. Moreover, it was also new and untested. After years of experience with confiscatory state orders, many farmers would rather not transact with state agents; they were sceptical that they will have a meaningful
option to reclaim pledged grain at a later date and, hence, they were (and remain) reluctant to pledge their grain to the authorities. With hindsight in 2003 it may seem obvious that less of the 2002 harvest should have been exported and more stored, but hindsight is always perfect. The underlying problem is that Ukrainian agricultural policy had not succeeded in creating an environment that is conducive to public and private grain storage, and this problem remains despite the experience of 2003.

Decree #1150 also called for the purchase of grain by state authorities. It was clear from the outset that this would not help relieve the situation on grain markets in Ukraine in 2003. First, state purchases do not add a single kilogram to grain supply in Ukraine. Instead, they reduce supply in the short run, thus increasing tensions and prices. The argument that these purchases were necessary to correct imbalances in grain supply across regions and time was not convincing; if the authorities had not interfered in regional movements and storage of grain, the market mechanism would have done a much more efficient job of correcting these imbalances than bureaucrats can.

Second, state grain purchases in Ukraine have a history of being unreliable (see above) and opaque. Many announcements are made, but it is never clear to market participants how much really has been and will be purchased, and under what conditions this grain will be released. Hence, state grain purchases have always had the effect of increasing uncertainty rather than stabilising markets. Grain market stabilisation policy should not be seen as something that is ‘strategic’ and therefore secretive, but should rather be carried out in a transparent manner. This means that policy targets (i.e. at what prices purchases will take place and up to what amounts, and at what prices these amounts will be released) should be clearly stated, and the (single!) institution responsible for public stockholding should be obliged to regularly disclose what stocks it is holding. In this way market participants can concentrate on ‘normal’ sources of risk (which are bad enough in agriculture), and do not have to worry about additional risk in the form of erratic policies. Policy makers who would like to try their hands at controlling or out-guessing grain markets (in other words speculation) should apply for jobs as grain traders with Cargill or some other grain trading firm at home or abroad and not play traders with public money. This is a lesson that appears to have been learned as a result of the 2003 ‘crisis’: public stockholding has been carried out in a much more transparent manner in 2004, and while targets have not always been met 100%, execution has been much higher than in earlier years.

The same transparency imperative applies to import and export regimes as well. On the import side, efforts to secure grain supplies from Kazakhstan and Russia could have had the effect of stabilising Ukrainian grain markets. But initial announcements that these countries would supply a combined 2.2 mill. tonnes did not have this effect because they were vague and the stated price (550 UAH/tonne) was quite obviously unrealistic. Why should Russia and Kazakhstan provide Ukraine with food wheat at this price, when world markets were tight and prices correspondingly high (135-140 US$/tonne or roughly 750 UAH/tonne)? Was this essentially a ‘present’ from old friends, or would Ukraine somehow repay the difference between 550 UAH/tonne and the true value of the grain in question. Or would, in the end, less Kazakh and Russian grain than announced be delivered at higher prices? Without clear answers to these questions, the announcement of the deals with Kazakhstan and Russia actually added to uncertainty. Traders were afraid to arrange necessary commercial imports because they were worried that they might have to compete in Ukraine with 2.2 mill. tonnes of inexpensive preferential imports from Kazakhstan and Russia. World market prices continued to increase in the meantime, and in the end Ukraine
had to pay more to satisfy its demand than would have been the case if imports had been arranged sooner.

This situation was exacerbated by the delay in removing import duties for food grain. Indeed, one must question why Ukraine needs such duties in the first place. In an export situation they are certainly not necessary because export parity prices in Ukraine are so much lower than world market prices (see for example the year 2002 in figure 15.1) that no trader would want to import in the first place. And in an import situation when imports are desperately needed, import restrictions make grain more expensive, which is simply counterproductive. Furthermore, the political procedure of removing import restrictions takes time which, as outlined above, had the effect of increasing the cost of Ukraine’s food grain imports. Import restrictions also bind policy making capacity as individuals and firms with influence try to benefit from the rents associated with a partial removal of import restrictions (tariff rate quotas, for example).

4 What should have been done?

By mid-2003 the fact that Ukraine would have to import food grain in the 2003/04 season was inescapable. How much it would have to import was not clear; many different figures were being bandied about, but all were based on a series of unknowns such as the exact size of the 2003 harvest, the exact composition of this harvest (qualities), the qualities and prices of available imports (which influence blending possibilities in Ukraine’s flour mills) and, of course, domestic demand (which is not, contrary to what some experts would have us believe, a universal constant!).

There was no need for policy makers to determine the exact amount of required imports or to somehow manage and control these imports. Their first responsibility was to ensure that imports would be subject to as little friction as possible (no restrictions, no need for approval or the collection of rubber stamps, as little registration and bureaucracy as possible). The only interference that was required was the observation and publication of data on individual transactions (a simple weekly published list of what qualities and quantities or grain arrived at what harbours from what sources, including complete disclosure of any government or inter-government transactions) and, of course, internationally accepted phytosanitary testing at the border. The publication of data on import flows would have helped the market find the right dosage that brings supply and demand in line with one another, and elimination of unnecessary frictions would have ensured that prices in Ukraine increase no more than is absolutely necessary.

Policy makers should have been more candid about the implications of the 2003 harvest for grain prices and, hence, consumers and producers. By the end of 2003, milling wheat cost between 900 and 1 000 UAH/tonne (see figure 15.1). This export parity price made sense, given contemporaneous world market quotes of 140-150 US$/tonne and fobbing and handling costs of roughly 25-30 US$/tonne. Announcements that the domestic price could be stabilised at 750 or 800 UAH/tonne were counterproductive in the sense that they created expectations that could not possibly be fulfilled.

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5 While wheat imports were freed of import VAT in July 2003, a law providing for duty free wheat imports was not passed until November 23, 2003.
The situation in 2003 called for a targeted rather than a blanket approach to protecting consumers. Artificially capping wheat, flour and bread prices benefits all consumers, including the relatively well off. These consumers can afford to pay higher prices for bread without any threat to their food security. This means that in terms of social justice, blanket controls on grain and bread prices result in considerable waste. Policy should instead have focused on identifying and helping those poor consumers for whom the situation in 2003 really did represent a crisis at the household level, for example via a food stamp program for pensioners, the unemployed and those on social security.

Blanket controls on grain and food prices also have the effect of reducing farm earnings. From a Ukrainian farmer’s point of view, grain markets have a built-in stabiliser; when the crop is low, prices are higher, and vice versa. Of course, this stabiliser is not perfect and for those farms that had next to nothing to sell in 2003, the prevailing high prices provided little comfort. But why should farmers who have already been extremely burdened by higher costs (reseeding, wasted inputs etc.) and a lower harvest this year, be burdened even more by indirect taxes in the form of price controls or export restrictions for feed grains? In late 2003 it was obviously imperative that the next harvest in 2004 be better. While weather conditions remain beyond human control, and the government did not have the financial resources to provide significant direct financial support, it should at least avoided unnecessarily adding to the farm sector’s problems by taxing farmers to provide untargeted support to consumers.

Government purchases of grain could not help to improve the situation following the 2003 harvest. If there had been a time to store grain it was 2002, when prices were much lower. Government purchases after the bad harvest could only add to the demand for grain at a time when it was already too high with respect to supply.

5 Conclusions

In essence, the events that unfolded in 2003 provide much support for the prescription that policy makers should adopt the maxim ‘less is more’. Hectic and often counterproductive activity in 2003 did nothing to correct the fundamental problem that Ukraine had brought in a bad harvest, that it must therefore import grain and that this grain was currently expensive on world markets. Indeed, there was nothing that any policy maker or any number of emergency meetings could do to change any of these basic facts. The food grain prices facing Ukraine on world markets were (and still are) beyond its control. Hence, all that agricultural policy could do was to ensure that prices in Ukraine did not increase any more than necessary, and to ensure that as much help as possible was channelled towards those individuals and households for whom exploding prices created true hardship.

By middle of 2003, the impression both within Ukraine and abroad was that Ukrainian agricultural policy making was as much in crisis as Ukrainian agriculture itself. Many of the measures announced and/or implemented cast doubt on Ukraine’s continued commitment to market-driven agricultural reform and restructuring, and many observers were concerned that Ukraine’s agricultural policy makers were beginning to backtrack and re-introduce some of the controls and mechanisms that did such damage in the 1990s.

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Luckily, the worst excesses were corrected in the ensuing months, as commercial imports finally began to arrive and the government began to target aid to needy consumers. When the harvest rebounded in 2004, prices fell back to export parity levels (see figure 15.2), and the 2003 ‘crisis’ became a thing of the past.

**Figure 15.2 Prices for food wheat in Ukraine and on world markets (1999 to late 2004)**

![Graph showing prices for food wheat in Ukraine and on world markets](image)

Source: See figure 15.1.
### Appendix: Statistical Data

**Table 1: Agricultural production in Ukraine (mill. tonnes)**

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Table 2 (continued): The structure of the agricultural sector in Ukraine until 1999

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Note: * The number of public sector farms exceeds the sum of collective and state farms as it also includes the so-called inter-farms, which are not listed here.
Table 3: The structure of the agricultural sector in Ukraine in 2003

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<td>Growth of gross agricultural output (% per annum)</td>
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<td>Share of households and private farms in gross agricultural output (%)</td>
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<td>Share of livestock products in agricultural output (%)</td>
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<td>Share of labour force in total employment (%)</td>
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<tr>
<td>Share of labour force employed by agricultural enterprises in total employment (%)</td>
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Source: INSTITUTE FOR ECONOMIC RESEARCH AND POLICY CONSULTING OF UKRAINE, STATE STATISTICS COMMITTEE OF UKRAINE and UKRAGROCONSULT.
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