

Der Open-Access-Publikationsserver der ZBW – Leibniz-Informationzentrum Wirtschaft
The Open Access Publication Server of the ZBW – Leibniz Information Centre for Economics

Brosig, Stephan (ed.); Hockmann, Heinrich (ed.)

Research Report

How effective is the invisible hand? Agricultural and food markets in Central and Eastern Europe

Studies on the agricultural and food sector in Central and Eastern Europe, No. 31

Provided in cooperation with:

Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO)

Suggested citation: (2005) : How effective is the invisible hand? Agricultural and food markets in Central and Eastern Europe, Studies on the agricultural and food sector in Central and Eastern Europe, No. 31, urn:nbn:de:gbv:3:2-4087 , <http://hdl.handle.net/10419/45948>

Nutzungsbedingungen:

Die ZBW räumt Ihnen als Nutzerin/Nutzer das unentgeltliche, räumlich unbeschränkte und zeitlich auf die Dauer des Schutzrechts beschränkte einfache Recht ein, das ausgewählte Werk im Rahmen der unter

→ <http://www.econstor.eu/dspace/Nutzungsbedingungen> nachzulesenden vollständigen Nutzungsbedingungen zu vervielfältigen, mit denen die Nutzerin/der Nutzer sich durch die erste Nutzung einverstanden erklärt.

Terms of use:

The ZBW grants you, the user, the non-exclusive right to use the selected work free of charge, territorially unrestricted and within the time limit of the term of the property rights according to the terms specified at

→ <http://www.econstor.eu/dspace/Nutzungsbedingungen>
By the first use of the selected work the user agrees and declares to comply with these terms of use.

**Studies on the Agricultural and Food Sector
in Central and Eastern Europe**

**How Effective is the Invisible Hand?
Agricultural and Food Markets
in Central and Eastern Europe**

Edited by
Stephan Brosig and Heinrich Hockmann



How Effective is the Invisible Hand?
Agricultural and Food Markets in Central and Eastern Europe

Studies on the Agricultural and Food Sector
in Central and Eastern Europe

Edited by
Institute of Agricultural Development in Central and Eastern Europe
IAMO

Volume 31

**How Effective is the Invisible Hand?
Agricultural and Food Markets
in Central and Eastern Europe**

**Edited by
Stephan Brosig and Heinrich Hockmann**

IAMO
2005

Bibliografische Information Der Deutschen Bibliothek

Die Deutsche Bibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.ddb.de> abrufbar.

Bibliographic information published by Die Deutsche Bibliothek

Die Deutsche Bibliothek lists the publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the internet at: <http://dnb.ddb.de>.

Diese Veröffentlichung kann kostenfrei im Internet unter
<www.iamo.de/dok/sr_vol31.pdf> heruntergeladen werden.

This publication can be downloaded free from the website
<www.iamo.de/dok/sr_vol31.pdf>.

IAMO Forum 2005 was made possible through the financial support of the German Research Foundation (DFG) and the German Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL).

© 2005

Institut für Agrarentwicklung in Mittel- und Osteuropa (IAMO)

Theodor-Lieser-Straße 2

06120 Halle (Saale)

Tel. 49 (345) 2928-0

Fax 49 (345) 2928-199

e-mail: iamo@iamo.de

<http://www.iamo.de>

ISSN 1436-221X

ISBN 3-938584-03-3

ACKNOWLEDGEMENTS

In 2003, the Institute of Agricultural Development in Central and Eastern Europe (IAMO) has initiated a series of events, the *IAMO Forum*. Its aim is to enhance discussion and exchange on issues relevant for the agri-food sector and rural areas with a specific focus on Central and Eastern Europe. The *IAMO Forum* brings together scientists and decision makers from numerous countries. The themes of *IAMO Forum* since its beginning are:

- 2003 Large Farm Management
- 2004 The Role of Agriculture in Central and Eastern European Rural Development: Engine of Change or Social Buffer?
- 2005 How effective is the invisible hand? Agricultural and Food Markets in Central and Eastern Europe

This volume of proceedings, available both as hard copy and pdf <http://www.iamo.de/dok/sr_vol31.pdf>, is a compilation of selected contributions to the *IAMO Forum 2005*, which will be held in Halle (Saale), Germany, at the Institute of Agricultural Development in Central and Eastern Europe from June 16-18, 2005.

We would like to thank all those persons and organisations who contributed to the realisation of the *IAMO Forum 2005* and the volume in hand. First of all, we thank all lecturers, whose commitment and papers made both the conference and the publication possible. Furthermore, we appreciate the financial support provided by the Federal Ministry of Consumer Protection, Food and Agriculture, the German Research Foundation (DFG) as well as the support of our excursion by Sachsenmilch AG, Leppersdorf, Saxony.

The conference would not be successful without the active engagement of such a large number of colleagues from IAMO, that we cannot mention them here. We wish to express our deepest gratitude to all of them.

For improving the book languagewise and supporting us in its technical production our thanks go to JAMES CURTISS, MARGOT HEIMLICH and SILKE SCHARF.

Halle (Saale), May 2005

Stephan Brosig and Heinrich Hockmann

CONTENTS

| | |
|--|-----|
| Acknowledgements | I |
| Agricultural and food markets in Central and Eastern Europe: An introduction..... | VII |
| <i>Stephan Brosig, Heinrich Hockmann</i> | |
| Selected agrifood markets in CEEC | |
| Agricultural markets in CEE – An overview | 3 |
| <i>József Popp</i> | |
| Regoverning agrifood markets in CEEC – Poland's pork and apple markets | 22 |
| <i>Jerzy Wilkin, Małgorzata Juchniewicz, Dominika Milczarek</i> | |
| Regoverning markets in the Hungarian dairy sector..... | 40 |
| <i>Imre Fertő, Csaba Forgács, Anikó Juhász, Gyöngyi Kürthy</i> | |
| Analysis of competitiveness, economic efficiency and distortions in the Estonian milk sector | 57 |
| <i>Piret Hein</i> | |
| Institutional framework for markets | |
| Building sustainable supply chains: The role of institutions | 77 |
| <i>Jill E. Hobbs</i> | |
| How effective is the invisible hand on technological and institutional change and the reduction of transaction costs in the food sector?..... | 95 |
| <i>Ernst-August Nuppenau</i> | |

Analytical approaches for measuring market efficiency

How effective is the visible hand of the government in stabilising the wheat and flour price relation in Ukraine?..... 115

Bernhard Brümmer, Sergiy Zorya

Marketing margins and price transmission on the Hungarian pork market.... 134

Lajos Zoltán Bakucs, Imre Fertő

Slovenian retailing market structures, retail prices, and size of marketing margins for food staples 150

Štefan Bojnec

Scarcity and preferences (Data Envelopment Analysis of Moscow region corporate farms) 168

Nikolay Svetlov

Organisational choice

Buying or renting in? Selling or renting out? Exploring contract choice on the Polish land market 185

Annette Hurrelmann

The organisation of buyer – Supplier relations in the food chain: The case of the German fruit processing industry and Polish farmers 201

Kai Maack

Supply Chain Networks: Analysis based on strategic management theories and institutional economics 214

Jon H. Hanf

Dynamics of labour market participation: What drives Chinese farmers into and out of off-farm employment? 232

Thomas Glauben, Thomas Herzfeld, Xiaobing Wang

Market channels and commercial orientation in Romania..... 249

Borbala Balint

Policy intervention

- Land reform and the development of agricultural land markets in Russia..... 269
Zvi Lerman, Natalya Shagaida
- Public quality schemes – Helping ensure well-functioning agri-food
markets in Central and East European countries?..... 303
Eckhard Benner
- Competition, market power and antimonopoly policy: A Hayekian
perspective 314
Jürgen Wandel
- An ex-ante analysis of a minimum price system for Ukraine..... 333
Oleg Nivyevs'ki, Arnim Kuhn

AGRICULTURAL AND FOOD MARKETS IN CENTRAL AND EASTERN EUROPE: AN INTRODUCTION

*STEPHAN BROSIG, HEINRICH HOCKMANN**

Since the seminal work of Adam Smith, markets have been considered an efficient tool for co-ordinating the behaviour of economic agents. The basic characteristic of a market economy is that the complex system of interaction among individuals is not centrally coordinated. Under the assumption of profit and utility maximisation (and a whole set of assumptions about the institutional framework), relative prices and their change over time provide the signals that guide, like an invisible hand, the allocation of resources, i.e., the structure of production and the intensity of input use in the various production processes. They do this by co-ordinating the activities of economic agents, i.e., of resource owners, producers, intermediaries, traders, and consumers.

After system change in the former Soviet Union and in Central and Eastern Europe (CEE) central economic planning had to be replaced by other forms of co-ordination. The general direction in all transition countries was towards a market economy, but the speed and depth of reforms towards an environment in which markets can evolve differed largely between countries, sectors and between different phases during the past 15 years. IAMO Forum 2005 focuses on this development and discusses the functioning of markets, the requirements for this, and the advantages and disadvantages of other co-ordination mechanisms under different environments in the agricultural and food sectors in Central and Eastern Europe.

CEE agri-food markets deserve researchers' and policy makers' attention for several reasons. Two of them regard the high demand for support to policy decisions that aim to stimulate economic and social development in the region. In most CEE countries, the significance of the agricultural and food sector is relatively high with respect to income and employment. In particular, rural areas

* Institute of Agricultural Development in Central and Eastern Europe (IAMO), Theodor-Lieser-Str. 2, 06120 Halle (Saale), Germany, Tel: 0049-(0)345-2928222, Email: brosig@iamo.de; Tel: 0049-(0)345-2928225, hockmann@iamo.de.

can benefit from the development of this branch of the economy. Also, there is marked indication that agri-food markets in CEE are not ensuring exchange as frictionless as possible. This means that large benefits can be expected if potential improvements of the economic environment are implemented and if individual agents adapt optimally to that environment.

Another motivation for economic research on transition countries is that we are looking at a huge region that started almost as a vacuum with regard to institutional settings. This means that a wide range of substantially different settings were introduced in the respective countries, and were only weakly confined by political rigidities or path dependencies. From a distant perspective, the repeated fundamental shifts in recent economic policies almost evoke the impression of a trial and error approach. The consequences of distinctively different options (across countries and periods) can be observed in a way almost similar to a laboratory situation. Such unique opportunity has attracted economists, particularly those interested in institutional economics, to conduct research on CEE. However, this also means that the experiences made in CEEC can enhance the general understanding of what markets can do and what the limitations of market coordination are.

This volume contains selected contributions presented at IAMO Forum 2005 and gives an overview of the major topics discussed there.

Partial analyses of specific economic problems usually abstract from the general economic framework which is assumed to be more or less constant as expressed in *ceteris paribus* clauses. Oftentimes, the set of institutional conditions is even assumed to be sufficiently well-described by the framework used in neoclassical models. Particularly for transition countries, this has frequently led to spurious results because crucial aspects of the framework actually in place were not considered, and sometimes were not even thought of. An extreme and very obvious example is the neglect of the effects of the replacement of monetary by non-monetary exchange in phases of a barter economy. There is no generic approach to avoid unintended omission of crucial framework conditions, but it must generally be emphasised that a broad look at the various interdependent markets and at the entire socioeconomic context of a country is needed before going into detail. Descriptive analyses of the situation in various markets form part of such a broad look. The contributions of POPP, FERTÖ et al., WILKIN et al., and HEIN in the chapter **Selected analyses from CEEC** provide excellent examples, and focus on market developments in new EU member countries. On the one hand, the papers show the heterogeneity of problems e.g. due to largely differing farm structures. On the other hand, several common patterns can be observed: The market shares and power of large processors and retailers (hypermarkets, etc.) are increasing. Also, international (especially intra-EU) trade in commodities has increased in response to CAP-induced price harmonisation. Both tendencies weaken the market position of farmers, particularly small entities which cannot supply in volumes sufficient for large processing and trade firms. Within the

food industry concentration increased as many smaller firms could not comply with EU processing standards and had to quit the market. The increased size and specialisation of large producers, as well as of large processors, made many of those firms co-ordinate business with each other through long-term contractual agreements rather than by relying on spot markets. This tendency is very distinct in the fruit and vegetable sector, as WILKIN's contribution describes.

Two contributions draw attention to the **institutional framework** itself, mainly by looking at circumstances which prevent market allocation from leading to an optimal outcome. HOBBS describes factors that impede investment and growth by drawing on transaction cost economics. Situations typical for transition countries are highlighted where e.g. transparency is not sufficient or the existence and reliable enforcement of contract or corporate law are not guaranteed. NUPPENAU stresses the need for the appropriate and precise formulation of land property rights, which should evoke a balance between governance and exclusion. The importance of appropriate and reliable institutions to avoid flaws is emphasised. But even with suitable institutions, transaction costs cannot be reduced to zero. The main reason for this is that since agents may gain from a head start of information, incentives to reveal their knowledge are quite restricted. Furthermore, some of the information required to make correct decisions is not available. This especially concerns information regarding all future contingencies. An uncertain future and the asymmetric distribution of information impose special problems when decisions have long-term effects and agents are linked together through investment decisions. This offers possibilities for opportunistic behaviour, i.e., when an agent behaves in a way that allows him to extract rents from the partners' activities. The friction induced in such situations may result in a market outcome that is biased by transaction costs. Mitigating this bias should be a goal of public policy but it is also in the interest of (at least some of the) private agents involved. This issue is discussed in more detail in the papers dealing with alternative governance structures.

A number of contributions to IAMO Forum highlight approaches for measuring the well-functioning of markets. While studies that aim to directly measure transaction costs are very rare and are necessarily limited to comparing only very specific portions of transaction costs, most studies focus on indirect indicators. These usually start from the idea that in a well-functioning, competitive market any supply or demand shocks are reflected in price changes, not only in the particular market where the shock occurs but also in other, related markets, i.e., in different locations or at different stages of the production and marketing chain. Consequently, an approach for assessing the functioning of markets is to compare price differentials with processing-, marketing- or transfer-costs, or – since these costs are usually difficult to quantify – to observe price differentials over time. Accepting the assumption that the costs reflected by price differentials are more or less constant (or stationary) over the observed time span, any additional price changes or a lack of price co-movement is interpreted as an indication

for insufficiently connected or insufficiently functioning markets. Three contributions in the chapter **Analytical approaches for measuring market efficiency** describe analyses which mainly focus on the vertical dimension, i.e., between-market stages. BOJNEC, in his descriptive price analysis for several agricultural products in Slovenia since 1991, finds a heterogeneous development of the farm gate/consumer price spread: The processing and marketing margins increased for wheat and beef while they declined for grapes (processed to wine), sugar and poultry. BRÜMMER and ZORYA, as well as BAKUCS and FERTÖ, use cointegration analysis to describe the degree and nature of vertical price integration in the Ukrainian wheat market and the Hungarian pork market, respectively. Both studies find that price changes are transmitted vertically, that there is a tendency to "correct" any deviations from some underlying equilibrium price-relationship. However, such error correction mechanisms are found not to be a constant, universal force. In the Hungarian paper, it could only be found for a sub-period of the observed time span, excluding the highly volatile early 1990s. Also, equilibrium was found to be achieved by adjustment of farm gate prices only while the retail prices were found to be exogenous, i.e., not responding to any disequilibrium. The paper on Ukraine shows that adjustment processes between wheat and wheat flour prices cannot be sufficiently described by a constant error correction mechanism for the period 2000 to 2004. In fact, four different regimes of adjustment processes were found to have been in force, reflecting particular phases of largely differing market situations and political interventions.

The functioning of markets depends on several crucial conditions. One of these conditions concerns the availability of information. Only if agents have perfect and complete information will the exchange lead to an outcome in which no individual can be better off without reducing the welfare of others. However, in the real world this condition regarding information is not fulfilled. Information is not perfect, since the future cannot be predicted with certainty. Incomplete information results from, first, not all information being revealed, and second, individuals not possessing the mental capacity to collect and process all information. Moreover, because of its asymmetric distribution, information can be regarded as a resource that can be exploited by agents. This means that there are incentives to hamper the diffusion of information to the public domain. In general, the more uncertain the future is and the more information is tacit, the worse markets will function, and the more beneficial become alternative mechanisms of coordination. Three papers dealing with this issue of **organisational choice**. HANF focuses on governance structures within supply chain networks that are appropriate for allowing an optimal flow of information between the involved individuals while retaining the necessary hierarchy for efficient implementation of strategic decisions. MAACK's analysis shows that there is strong mutual interest between producers and processors of berry fruits to reduce marketing and procurement risk, respectively. This can be achieved by switching from spot market exchange to contractual supply agreements. A prerequisite for such

agreements is that a well-balanced distribution of risks and risk premiums between the farmer and processor is implemented. This means that processors, who – facing a multitude of small producers – are used to opportunities for exerting market power, have to agree to cover part of the production risk through appropriate contractual clauses. Finally, BALINT looks at the various marketing channels used by Romanian farmers and finds that a self-enforcing dualism exists. For commercially-oriented farmers who can supply large quantities, marketing directly to traders, wholesalers and processors is most favourable and involves relatively low transaction costs. Although this form of supply-relationship is usually not based on contractual agreements, it can still be characterised by a certain stability over time. In contrast, small farmers whose production does not considerably exceed the subsistence level incur relatively high (per unit) transaction costs in selling their produce on local markets and to other farmers.

Another aspect of organisational choice is the question of whether ownership of production factors is transferred or only the right to use them temporarily. The uncertainty of future developments implies that the possession of resources cannot be only regarded from the point of view of income generation at a certain point in time. With perfect foresight, there is no difference whether a factor is rented or purchased, because the remuneration would be the same. This perfect substitutability is no longer given when the future is uncertain. Income generation, then, is only one feature of ownership. Additional aspects such as insurance, wealth, and speculation as motivations for possession affect the value of ownership and thus shift the demand and supply curves of the factor. HURRELMAN picks up this issue in her analysis of the Polish land market and shows the impact of additional grounds for valuing property on the decision to rent or to buy land.

Uncertainty may also affect the specialization of factor use. Allocating a factor of production to different production activities reduces the risk of income instabilities, but at the cost of specialization gains through economics of scale. Moreover, the decision on income combination is – besides risk – affected by a complex interaction of other determinants. GLAUBEN et al., analyse these interactions for the case of part-time farming in China and show how the decision of income combination is affected by household characteristics, human capital and other variables.

Incomplete and imperfect information not only causes individuals to choose optimal governance modes, often it is also understood as a call for government intervention. The selected papers in the chapter on **policy intervention** plead for careful selection and coherent implementation of policy instruments. BENNER, as well as KUHN, highlight the significance of information diffusion and argue in favour of government intervention in this area. However, both emphasise that these interferences should be used carefully and be adjusted to specific market failures. Both argue that setting up information systems would improve the

functioning of markets. BENNER also discusses possible negative impacts if governments that engage in setting up and enforcing product and process standards try, at the same time, to foster a sector like agriculture through support in marketing. The latter activity affects the government's (crucial) credibility in the first activity. KUHN points to negative welfare effects and budgetary requirements of an intervention system which is implemented to increase price stability.

Moreover, when a government intervenes in market allocation or intends to provide rules that should facilitate the exchange on markets, it has to take into account that the new regulation has to be implemented in a coherent manner. This requires the various policy regulations and institutional settings to be complementary and not cause frictions which hamper the functioning of the system. LERMAN and SHAGAIDA highlight this aspect in their discussion of the Russian land market, where bureaucracy and high costs for the registration of property rights can be regarded as a major cause of the low number of land transactions.

However, since economic activities take place in a dynamic environment, the comparative static point of view may lead to inappropriate policy formulation. WANDEL discusses this aspect in the context of competition policy. From a comparative static point of view, market power has to be assessed negatively because of the distortions of resource allocation. However, monopoly profits are an indicator of extra rents and thus provide incentives for market entry. On the one hand, this threat may lead to special pricing schemes and/or to the accelerated development of technological change so that a monopolist can consolidate its market position. But it is possible, on the other hand, that market entry may in fact happen. In this case, one would observe structural change, which would be accompanied by an improved use of resources. This in turn means that competition policy should not be oriented towards an optimal market structure but towards the facilitation of market entry so that competition can discover market opportunities and determine the optimal structure of the market.

The present volume shows the wide range of interesting and controversial topics that are concerned when looking at co-ordination, particularly on markets in CEE agri-food sectors. It remains a hope that the heterogeneity and dynamics of the developments will decrease as successful constellations of framework conditions, organisational choices and individual behaviour become more and more obvious and widespread in the region. Conversion to sustainable, balanced patterns might take place, but this cannot be taken for granted. However, chances for such development are better the more stable and balanced political developments, as well as international co-operation, become. We hope that the academic community will contribute towards such goal.

SELECTED AGRIFOOD MARKETS IN CEEC

AGRICULTURAL MARKETS IN CEE – AN OVERVIEW¹

JÓZSEF POPP*

ABSTRACT

The paper analyses the impact of EU enlargement on the agricultural markets in the New Member States (NMS). A high level of market integration in the EU-25 was achieved prior to enlargement. Sixty-five percent of all agricultural exports of the NMS and 69 % of all imports went to EU-25 destinations in the years immediately prior to accession. The intensity of production and productivity are relatively low in the NMS as compared to the EU-15. This means that agricultural potential can be only gradually used and that structural adjustment will continue. The market impact of enlargement seems to be positive for the NMS and will lead to the stabilisation of agricultural production, particularly in the area of cereal and meat production. Agricultural markets will benefit from the trade creation effects of integration into the single market and from the support of the CAP.

Keywords: Enlargement, production, agricultural market, trade, integration of markets.

1 MARKET DEVELOPMENTS AFTER ENLARGEMENT

Following a historical agreement on enlargement, 10 New Member States (NMS) acceded to the European Union on May 1, 2004. Although the European Union (EU) has expanded its membership in the past, this enlargement is unique in terms of its scope, diversity, and number of countries, area, population and large rural sector. The NMS add about 38 million ha of utilised agricultural area to the 130 million ha of the old Member States, which represents an increase of 30 %, while production in the EU-25 increases by about 10 % to 20 % for most

* Agricultural Economics Research Institute, Budapest, e-mail: poppj@akii.hu.

products. The NMS add 52 % to the agricultural work force of the EU, illustrating the low productivity as compared to the old Member states.

The Common Agricultural Policy (CAP) as applied in 2003 or planned under Agenda 2000 will never be implemented in the new Member States (NMS). Farmers from NMS have access to CAP market measures, but direct payments (*Single Area Payment Scheme: SAPS*) will be phased in over 10 years. The Act of Accession provides for a transitional period for the progressive introduction of the CAP direct payments in the NMS. In 2004, NMS received 25 % of the full EU-15 payment rate from EU budget, a number that will gradually rise to 100 % by 2013. Direct payments are divided equally over all eligible hectares, with no distinction between sectors. Two-thirds of the direct payments are allocated for Poland and Hungary, followed by the Czech Republic and Slovakia (Table 1).

Table 1: Allocation of direct payments in the EU-10

(Million EUR)

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------|-------|-------|---------|---------|---------|---------|---------|---------|---------|
| Czech Republic | 227.9 | 265.7 | 342.4 | 427.8 | 513.2 | 598.5 | 683.9 | 769.3 | 854.6 |
| Estonia | 23.4 | 27.3 | 40.4 | 50.5 | 60.5 | 70.6 | 80.7 | 90.8 | 100.9 |
| Cyprus | 8.9 | 10.4 | 13.9 | 17.4 | 20.9 | 24.4 | 27.8 | 31.3 | 34.8 |
| Latvia | 33.9 | 39.6 | 55.6 | 69.5 | 83.4 | 97.3 | 111.2 | 125.1 | 139.0 |
| Lithuania | 92.0 | 107.3 | 146.9 | 183.6 | 220.3 | 257.0 | 293.7 | 330.4 | 367.1 |
| Hungary | 375.4 | 408.7 | 495.1 | 618.5 | 741.9 | 865.2 | 988.6 | 1 111.9 | 1 253.3 |
| Malta | 0.67 | 0.78 | 1.59 | 1.99 | 2.38 | 2.78 | 3.18 | 3.57 | 3.97 |
| Poland | 724.3 | 845.0 | 1 098.8 | 1 373.4 | 1 648.0 | 1 922.5 | 2 197.1 | 2 471.7 | 2 746.3 |
| Slovenia | 35.3 | 41.4 | 55.5 | 69.4 | 83.3 | 97.2 | 111.0 | 124.9 | 138.8 |
| Slovakia | 97.6 | 113.6 | 144.5 | 180.5 | 216.6 | 252.6 | 288.6 | 324.6 | 360.6 |

Source: OFFICIAL JOURNAL OF THE EUROPEAN UNION, 30.03.2004.

A large portion of the funds supporting agricultural policy will have to come from non-CAP funds. Implementation of the CAP in the NMS will be concluded after a transition period. During this phase-in period, the NMS may complement EU funds for direct payments by national contribution (*Complementary National Direct Payment: CNDP*) up to 30 % above the applicable phasing-in level for direct payments for the relevant year. CNDP shall be granted for the production of products covered by the CAP support schemes. Bovine animals (beef production) and ewes can be supported exclusively by CNDP. Most support will continue to benefit larger and often richer farms. Area payments granted for the NMS will, by 2013, reach an average 83 % of the level of the EU-15 (Table 2).

Table 2: Area payments granted for the EU-10 [SAPS+CNDP*]/ha (in EUR/ha)

| Country | Reference yield t/ha | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011-2013 |
|---------------------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-----------|
| Czech Republic | 4.20 | 145.7 | 159.0 | 172.2 | 185.5 | 212.0 | 238.5 | 265 | 265 |
| Hungary | 4.73 | 149.5 | 161.0 | 174.3 | 208.6 | 238.4 | 268.2 | 298 | 298 |
| Poland | 3.00 | 104.0 | 113.4 | 122.9 | 132.3 | 151.2 | 170.1 | 189 | 189 |
| Slovakia | 4.06 | 140.8 | 153.6 | 166.4 | 179.2 | 204.8 | 230.4 | 256 | 256 |
| EU-10 | 4.00** | 138.6 | 151.2 | 163.8 | 176.4 | 201.6 | 226.8 | 252 | 252 |
| EU-15 | 4.77 | 300.5 | 300.5 | 300.5 | 300.5 | 300.5 | 300.5 | 300.5 | 300.5 |
| EU-10/ EU-15,% | 83.8 | 46.1 | 50.3 | 54.5 | 58.7 | 67.1 | 75.5 | 83.8 | 83.8 |

Source: DG AGRI, Country Reports.

Notes: * CNDP: From the national budget.

** Author's estimate.

The trade policy regime of the NMS has changed. External duty rates of the NMS are now harmonized with the EU-15; internal rates are set at zero. The impacts on intra-EU-25 trade are driven by changes in production and consumption, rather than by the lowering of intra-EU-25 protection, which was already low before accession. Nevertheless, trade creation effects have been observed since accession in a number of areas where prior to accession barriers to trade existed, in particular between old and NMS themselves, but also between old and new Member States. There are strong indications that membership has been very positive for the trade integration between the NMS.

The situation of agricultural production in the NMS can be considered rather positive than negative. Most NMS have been able to expand trade with the EU both on the import and export side. The precise level of direct payments is one of the farmers' main concerns because of the unclear information and late decisions of most governments. Nevertheless, requests for national and EU funds far outstrip their availability in most countries showing high investment activities.

Land prices have increased in the NMS, particularly in the Baltic countries, despite the fact that land purchases by foreigners and legal entities are generally restricted or forbidden. However, in some countries (Czech Republic, Hungary, and Slovakia) land owners that are not necessarily part of the rural population or

the farming community are quite aware of the amount of payments. Sharp increases of land prices or rental fees have hampered investments and restructuring in some countries.

While prices for most commodities in the NMS were historically below EU-15 prices, accession has led to a moderate decreases in the EU-15 prices, whereas for the 10 NMS, domestic prices for many commodities have increased substantially. Producer prices have generally increased for livestock, meat and dairy products in the NMS.

High quality beef prices increased significantly due to sustained demand from the old Member States. By contrast, low quality beef prices have continued to decline. On average, beef prices are significantly higher today than before enlargement and domestic demand continues to be very weak. Among the largest agricultural producers, prices in Poland have developed particularly well, while Hungarian prices have remained rather weak or have been very volatile. Poultry prices have increased in a number of NMS due to strong export opportunities to the old Member States. Cereal prices in Hungary have been significantly lower than in the other main net exporting Member States. Czech and Slovak prices have developed more smoothly but have increased less than in other countries. That is the result of a record harvest and high transport costs to markets in the EU and other countries. Milk markets are characterised by strong competition for high quality milk, which is in short supply (Poland, Lithuania and Latvia). The spread between low and high quality milk prices is still very high in these countries. Milk producers face continued burdens of adjustment in the dairy sector (for example in Hungary, Slovakia, Slovenia and Poland).

The situation of the food industry in the NMS is rather mixed. In most countries, consolidation and concentration are ongoing at an increasing pace due to foreign direct and domestic investments. The dairy industry faces challenges due to low standards and marketing difficulties in a number of countries. Favourable market opportunities in the EU, in particular for live animals, have helped to reduce the negative impact of diverging competitiveness of meat processors.

Consumers in the NMS have not been significantly affected by the CAP. In most countries only a limited number of products – sugar, beef, pork and poultry – have experienced significant price increases. Other prices, such as imported, high value-added dairy products, have fallen.

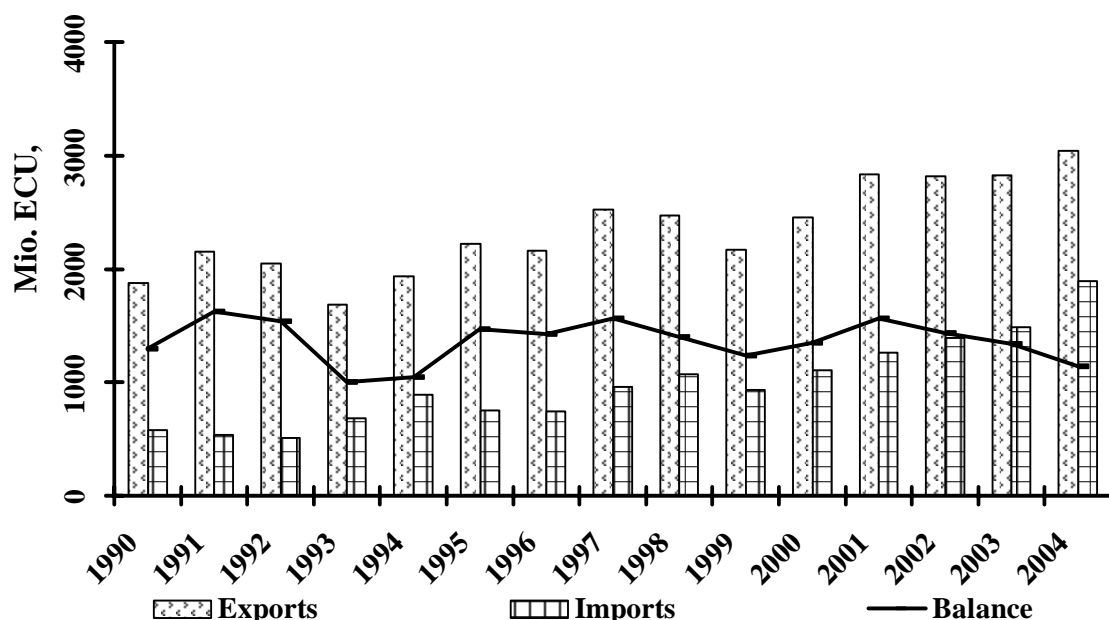
2 DEVELOPMENT IN AGRICULTURAL TRADE OF THE NMS

The relative importance of agricultural trade declined in the NMS over the last decade, and now stands at approximately 8 % of total trade. The agricultural trade balance of the EU-10 remained negative with the world and the EU-15. Trade balance of the EU-15 with the EU-10 amounts to about 1 billion EURO.

Hungary has maintained its position as a net exporter over a long time. Poland has turned from one of the largest net importers to a net exporter since 2003 thanks to steady growth of its agricultural exports to the world and particularly to the EU-15. All other EU-10 countries continued to exhibit a trade deficit. The main products contributing to this trend were processed foods, especially processed fruits and vegetables, poultry and dairy products, which benefited from improved competitiveness in the EU-10 food industry.

Agriculture and food exports in Hungary have displayed a positive trade balance for decades, bringing 3.04 billion EURO to the country in 2004. Agriculture and food imports have increased, and amounted to 1.87 billion EURO in 2004. The trade surplus in this sector consistently fluctuated between 1-1.5 billion EURO over the past 10 years (Figure 1).

Figure 1: Agriculture and food trade



Source: AGRICULTURAL ECONOMICS RESEARCH INSTITUTE (AKI), Budapest, 2004.

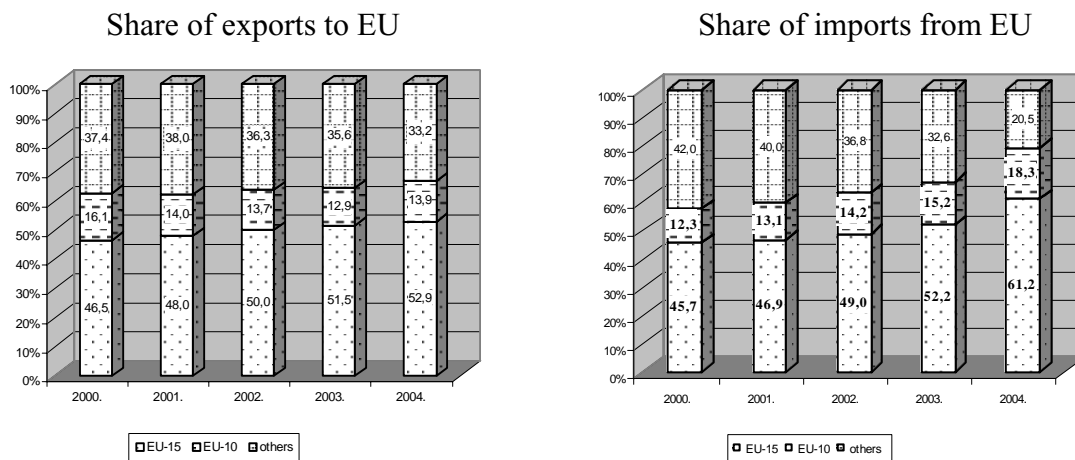
In the coming years, the rate of the increase of imports will exceed that of exports, but the trade balance will remain positive, albeit with a decreasing trend. The prospect of agricultural exports can even be improved by the consolidation of livestock production and by the development of commercial infrastructure.

The EU-10 agricultural trade has been dominated by two major players, Poland and Hungary, with high shares for some meat products (beef, pork, poultry). Furthermore, over 50 % of the EU-10 cereal exports to the world have come from Hungary. The export shares of dairy products have been more evenly distributed among the EU-10 countries, with the Czech Republic, Poland and Lithuania as major exporters. The degree of integration between the EU-10 and

EU-15 has increased substantially over the last decade. By 2003, the share of agricultural exports to the EU-25 rose to 66 %, while the share of imports from EU-25 destinations increased to 71 %. The integration of the EU-10 to the agricultural trade of the EU-25 is more advanced on the import side. The most integrated EU-10 countries within the EU-25 market were the Czech Republic, Slovakia, Estonia and Latvia, with import and export shares of about 70-80 %.

Hungarian agriculture and food products are mostly traded with European countries. The degree of agricultural trade integration between Hungary and the EU-15 was 50 % in 2003. The share of exports going to the EU-25 reached 65 %, and the share of imports coming from the EU-25 rose to 80 % 2004 (Figure 2).

Figure 2: Integration of agricultural trade between Hungary and the EU

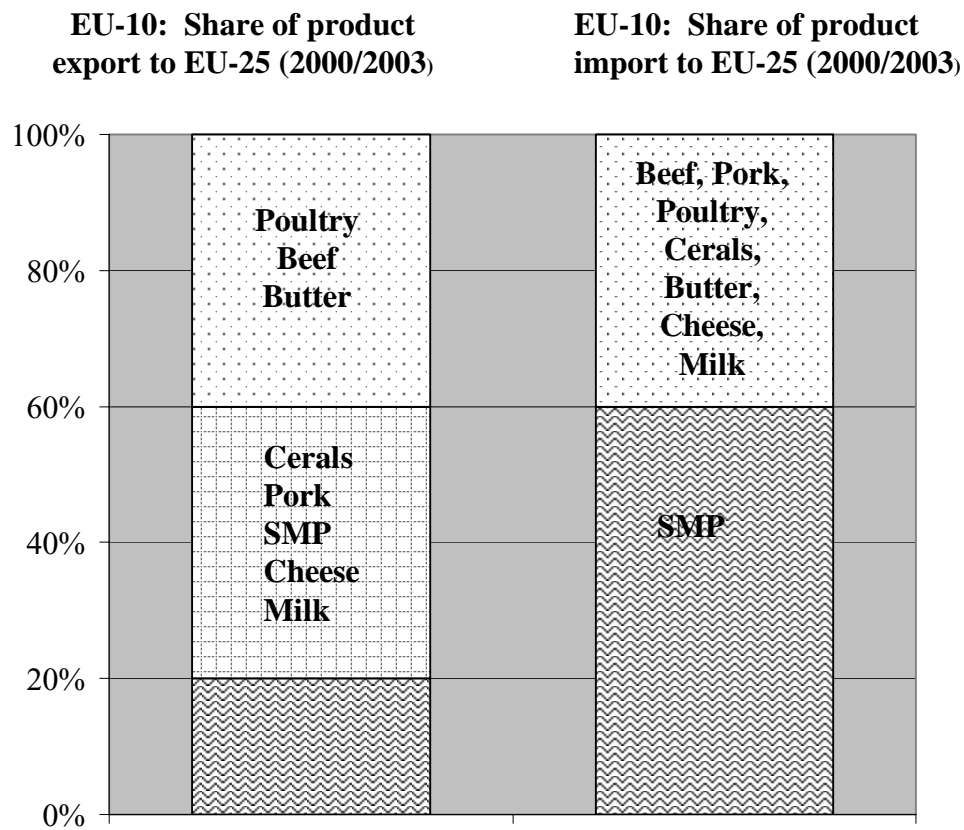


Source: AGRICULTURAL ECONOMICS RESEARCH INSTITUTE (AKI), Budapest, 2004.

The EU-15 countries have increased trade with the EU-10 even though imports have been growing faster than exports. The leading net exporters are the Netherlands, Spain and France, while Germany, Austria and the United Kingdom have shown negative trade balances with the EU-10. The most integrated EU-15 countries regarding agricultural trade with the EU-10 are Austria and Finland, with export shares of 7.3 % and 5.2 %, as well as import shares of 12.9 % and 7.3 %, respectively.

For the cereals, meat and dairy sectors, about 80 % of all EU-10 imports have come from EU-25. By contrast, the EU-10 share of exports to the EU-25 has been more diverse across countries and products (Figure 3).

**Figure 3: Integration of the EU-N10 into the EU-25 market ‘
(selected products)**



Source: EUROPEAN COMMISSION (2004): DG for agriculture prospects for agricultural markets and income 2004-2011 for EU-25, Brussels/Belgium, December 2004.

Cereal markets

The NMS contribute to about 20 % (55-60 million t) of the cereal production and operate on 30 % (15, 5 million ha) of the cereal area of the EU-25. Poland is the largest producer, with 50 % share of the cereal production of the EU-10, followed by Hungary, the Czech Republic, and Slovakia. Of these countries, Hungary has been the only significant exporter of cereals, with 3-4 million tons per year (Table 3). The other NMS have remained close to self-sufficiency, but exports have increased in recent years in Poland, Lithuania and Latvia.

Table 3: Supply balance of cereals (Mio t)

| Supply balance | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Production | 11,306,329 | 14,119,682 | 13,004,238 | 11,374,527 | 10,037,094 | 15,046,886 | 11,705,656 | 8,769,586 |
| Feed | 7,164,314 | 6,678,383 | 6,889,679 | 7,105,322 | 6,142,325 | 6,238,594 | 6,436,568 | 6,428,556 |
| Food | 2,163,781 | 2,382,092 | 1,961,825 | 1,855,159 | 2,326,721 | 2,258,890 | 1,922,862 | 2,105,721 |
| Imports | 106,165 | 50,142 | 29,726 | 47,826 | 74,897 | 112,155 | 58,960 | 117,309 |
| Exports | 505,406 | 2,294,149 | 4,260,197 | 2,490,254 | 1,706,728 | 3,274,761 | 3,473,064 | 2,686,507 |
| Others* | 1,578,993 | 2,815,200 | 77,737 | -28,382 | -63,783 | 3,386,500 | -67,878 | -2,905,925 |

Source: HUNGARIAN CENTRAL STATISTICAL OFFICE (KSH).

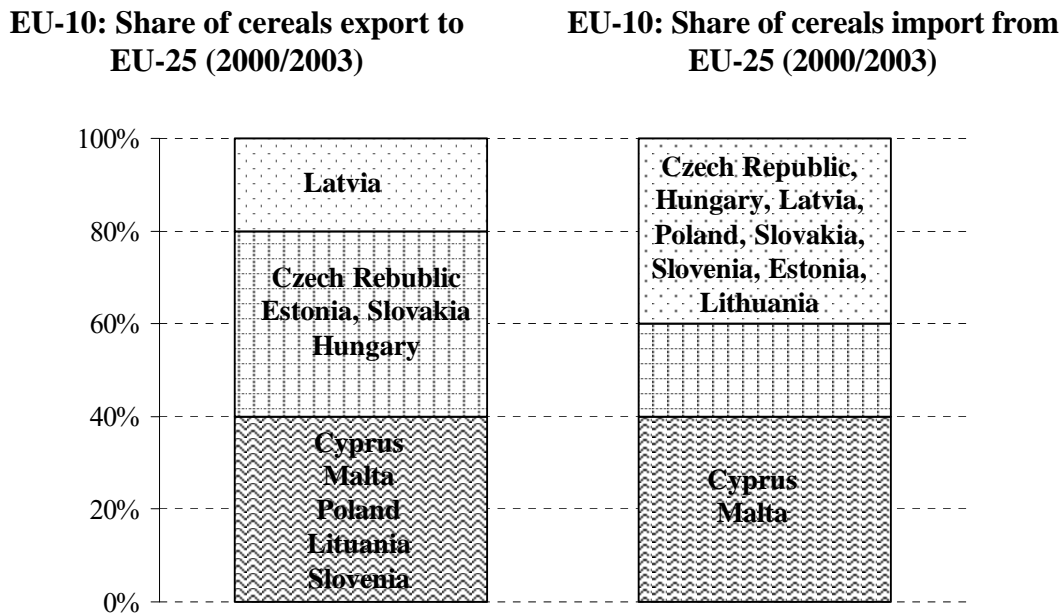
Notes: Self-sufficiency rate: 150-200 % .

* Net stock, seed, industrial use.

Over the last decade, EU-10 exports stagnated at around 3 to 5 million tons depending on the harvest, with a similar level of imports. In 2004, exports reached only several million tons after a record harvest of 60 million tons. Cereal consumption has declined, stagnating at around 50 million tons per year.

Feed demand is projected to increase despite the gradual improvement in feeding efficiency in the NMS. The increased feed demand is expected from higher poultry, egg and beef production and the more intensive dairy production after enlargement. For each ton of meat produced, about 50 % to 80 % more cereals are used in the NMS than in the EU-15 on average. In 2002, 5.4 tons of cereals were used for the production of 1 ton of meat and eggs in the EU-15, while the ratio was as high as 8 in the NMS. This difference of 50 % will decline, thanks to changing prices, the increased use of protein feed and higher feed technology. The higher level of cereal use for feeding as compared to the old Member states should remain an important base for cereal markets in the NMS.

The integration of cereal markets in the NMS is quite advanced. Most of the imports of the NMS come from countries in the EU-25. Over the years, more trade integration can be expected on the export side, in particular in NMS with a low level (45 %) of trade integration on the export side: Slovenia, Lithuania, Poland, Cyprus, Hungary and Malta (Figure 4). The net exporting countries with low trade integration would benefit from these developments. The net importing countries of the EU-10 should gain from lower feed cereal prices.

Figure 4: Trade integration of cereal markets in the new Member States

Source: EUROPEAN COMMISSION (2004): DG for agriculture prospects for agricultural markets and income 2004-2011 for EU-25, Brussels/Belgium, December 2004.

However, market prospects appear somewhat clouded for Hungary, the Czech Republic and Slovakia as high transport costs prevent the competitively produced cereals in these regions from reaching markets in the EU, as well as other countries. In Hungary, producer prices are foreseen to remain lower than intervention prices. These cereals could gain regional market share because Hungarian cereal feed prices seem to be regionally competitive. The expected low level of regional cereal feed prices would then contribute to the stabilisation of cereal markets by the expansion of cereal-fed intensive livestock production, in particular pork production.

The production of soft wheat in the NMS is expected to expand due to favourable price conditions. Production reached 24 million tons in 2004, but under normal weather conditions and increasing yield, the production level should reach 22-23 million tons in the upcoming years. The introduction of mandatory set-aside after the depletion of the SAPS should reduce production by 0.6 million tons, owing mainly to the decrease in area in Hungary, the Czech Republic and Slovakia.

The largest soft wheat producing country in the NMS is Poland, with a production of 9 million tons on average. Poland has only recently become a net exporting country and due to favourable market conditions for soft wheat, Poland could develop an export potential of 1.5 million tons, with imports at about 0.5 million tons. Poland will be marginally affected by mandatory set-aside in the case of an expected continuous expansion of production. Hungary will continue to export

2 million tons, which would decline by 0.2 million tons due to the introduction of mandatory set-aside. Hungary will remain the largest exporter of soft wheat in the NMS. Production level in Hungary could reach 4 million tons, with a domestic consumption of 2.5 million tons (of which 0.8 million tons is used for feed). The expansion of feed wheat will be constrained by the increasing competitiveness of maize. The production of soft wheat will also slightly increase in the other NMS. Higher production and use should come from the Czech Republic, Slovakia, Latvia and Slovenia.

Domestic use in the NMS will increase from 18 million tons to 20 million tons due to the increase of human consumption and industrial use. Exports of the NMS could stabilise at 5 million tons, and about 2 million tons of imports are expected.

12 million tons of maize was produced in 2004 in the NMS. With domestic use at 9 million tons, exports should have reached 3-4 million tons. The relatively high transport costs in the maize production regions has left producer prices significantly below those prices observed in the EU-15, slowing down export opportunities. Production, therefore, would stabilise at around 11 million tons. The pace of production growth will be reduced when set aside is implemented, leaving production at 10 million tons.

Competitive maize prices can stimulate domestic use from the current 9 million tons to 10 million tons per year. Feed maize will benefit from the increase in livestock production and from the increasing substitution of barley in total feed demand. Export opportunities should exist for 2 million tons, while imports are expected to increase as well. Higher trade will take place with both EU and other countries.

Hungary is the largest producer of maize among the NMS, with a production of 8 million tons in 2004, which represented 66 % of the production of the NMS. The second largest producer was Poland, with 2.2 million tons. Hungary is also the largest consumer of maize, with 4.8 million tons in 2004, followed by Poland, with 2.1 million tons. Slovakia and the Czech Republic are the third and fourth largest producers and user of maize, with around 0.7 and 0.6 million tons of production and consumption, respectively. The Czech Republic, a traditional net importer of maize (0.1-0.2 million tons per year) will expand maize feed use due to the opening of markets and the expansion of poultry and pork production.

The Hungarian cereal harvest doubled in 2004. As a result of the extraordinarily favourable weather conditions that year, it was a record harvest: 16.7 million tons of cereals were harvested in 2004. The outstanding harvest caused serious difficulties in storage, because 1.5 million tons of cereals could only be stored in emergency storage facilities. A good harvest has translated into lower producer prices. In fact, Hungarian market prices are the lowest among the NMS. Farmers expected a more stable cereal market. Certainly cereal farmers need to invest

into their own stock capacities in order to better benefit from the CAP. Export opportunities for maize and wheat appears less optimistic. Wheat and maize prices have remained below the intervention price level.

Hungarian farmers offered over 4 million tons of cereals for intervention in 2004 because there were no buyers for the requested price of EUR 94-100/t. Both domestic and foreign buyers found that price too high. Hungarian cereal production is not competitive on foreign markets, certainly not around the intervention price expected by the producers. Moreover, the costs of transport to the sea amount to EUR 20 per ton, at least.

Both the Budapest Commodity Exchange (BCE) and the free market prices have remained far below the EU intervention price level (EUR 101, 31/t) since the 2004 harvest because producers less and less believed in the success of the intervention. The intervention of cereals was begun too late (on March, 2005) and is expected to be finished by the end of July 2005 (Table 4).

Table 4: Futures quotations, Cereal section of BCE

| Commodity | Purchase quotations | | | Settlement price on 31 st March for May | Settlement price on 31 st March for May |
|---------------|---------------------|---------|--------|--|--|
| | May | August | Dec. | | |
| | HUF/t | | | HUF/t | US\$/t |
| Milling wheat | 23,000 | 22,200 | 23,200 | 23,000 | 120.40 |
| Feed wheat | – | – | – | 21,400 | 112.00 |
| Feed barley | – | 20,400 | – | 22,700 | 118.80 |
| Maize | 23,000 | 23,600* | 23,200 | 22,600 | 118.30 |

Source: BCE.

Note: Exchange rate: HUF 191/US\$.

After a bumper harvest of 284 million tons in 2004, 10.5 million tons of cereals were offered to public stocks in the EU-25 until April 2005, bringing the total level of cereals in the intervention stocks to 13.5 million tons. Of the total offers of intervention, 60 % concern the NMS. The export tenders of the Commission favour cereals located in areas with relatively easy access to export harbours and have not managed to relieve the situation in the NMS and other landlocked countries, where the surplus situation is particularly difficult. Making intervention storage space available is a national requirement; the lack of intervention storage in the NMS is serious, leading to important market disturbances in the whole of the EU. Therefore, the Commission decided in March, 2005 to sell the following intervention stocks of wheat: Hungary: 320,000 tons; Czech Republic: 300,000 tons; Poland: 93,084 tons; and Austria: 80,663 tons.

Hungary will remain the main exporter of maize. Set-aside will reduce Hungary's production by 0.5 million tons. Domestic use will expand from 4.8 million tons to 5.2 million tons. Hungary's production will benefit from the opening of regional markets and better export conditions due to accession.

The Hungarian domestic market for cereals is characterised by the decreasing use of cereals for food and feed, and by the increasing output of feed cereals. One of the consequences of the introduction of the SPS (*Single Payment Scheme*) will be the decreasing production of cereals due to the then-compulsory set-aside of land, which is not currently in effect under the SAPS. Increasing production is expected in regions where production growth is accompanied with the improvement of production efficiency as well. Hungarian cereals are competitive only within a limit of certain distances of transportation, primarily by shipping cereals on the Danube River. The revenue position of maize production is considered to be more favourable than wheat production. The EU is a net exporter of wheat, therefore Hungarian wheat producers will face pressure to decrease producer prices or to satisfy special consumer needs (high quality wheat). The top priorities of cereal production are the improvement of storage and handling facilities, quality insurance, and production efficiency (POPP et al., 2004).

The forecasted decrease in the number of livestock (pork, poultry and dairy production) will decrease the annual feed-use of cereals by 2 million tons, which may lead to a significant domestic oversupply of cereals (self-sufficiency rate: 150-200 %) and to the heavy intervention of maize, which may lead to decreasing cereal prices. In the EU-25, the self-sufficiency rate of maize is around 96-100 %. Hungarian maize seems to have better chances to be sold in the single market of the EU than wheat, which will encourage the improvement of the commercial infrastructure needed for intra-EU trade.

Meat and dairy markets

Strong growth in per capita consumption of meat and milk products led to significant market growth in the last decade. Per capita consumption of meat and eggs in the NMS is at 80 % of that in the old Member States. Due to the favourable development assumed for household incomes, meat and egg consumption will increase in the NMS. Cereal-fed livestock production should benefit from favourable regional feed cereal prices, as well as from opportunities to expand the market share of poultry and egg on the EU markets. Milk production and dairy markets should further stabilise.

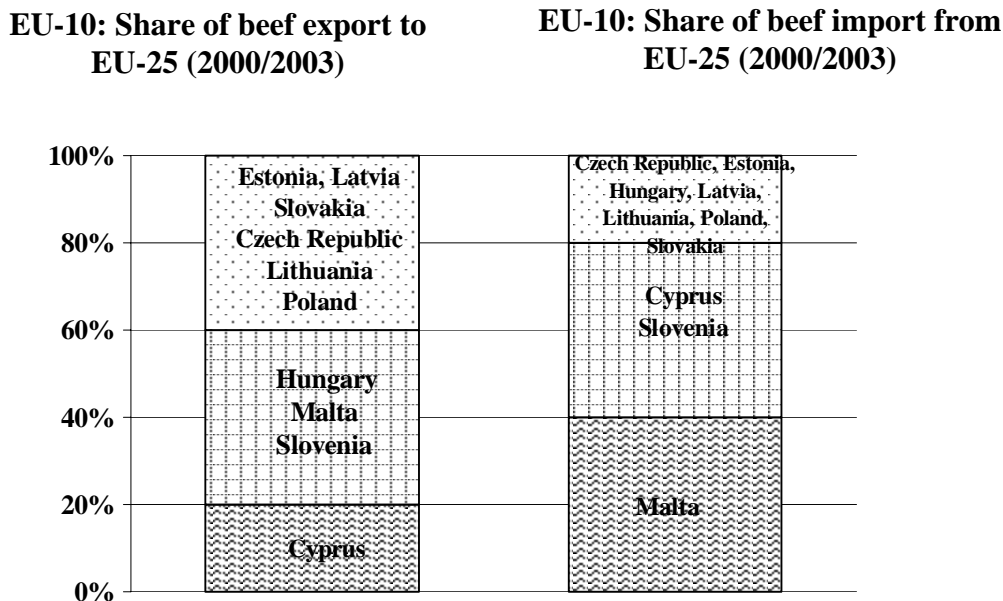
Beef market

The NMS showed a decline in both beef production and beef consumption over the last decade. In 2004, production reached 0.65 million tons. Beef meat consumption will stabilise at 0.6 million tons thanks to increasing income levels and the better availability of quality beef. Production is expected to slowly decrease again and stabilise around 0.6 million tons.

The NMS already reached a high level of market integration prior to enlargement. Imports almost exclusively came from EU-25 countries. This integration is lower on the export side (Figure 5). Poland, the largest exporter of beef among the NMS, should benefit most in quantitative terms from the increasing export

opportunities in the old Member States. However, strong relative gains in exports should also be observed for Lithuania, Hungary and the Czech Republic.

Figure 5: Trade integration of beef markets in the new Member States



Source: EUROPEAN COMMISSION (2004): DG for agriculture prospects for agricultural markets and income 2004-2011 for EU-25, Brussels/Belgium, December 2004.

The development of beef markets and beef prices in Poland will depend on export opportunities to EU countries, since domestic consumption will stagnate. A similar development will be observed in the Baltic countries, the Czech Republic, Slovakia, Hungary and Slovenia.

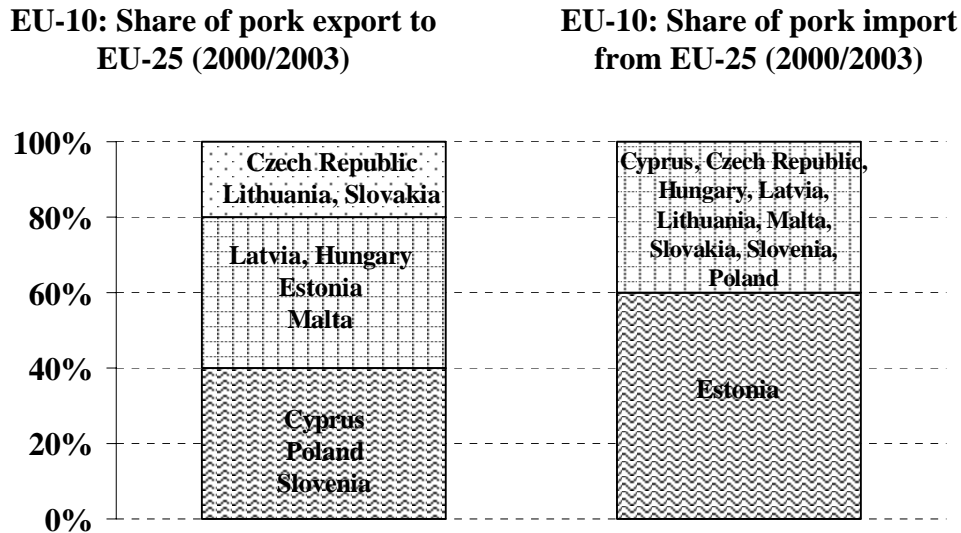
Pork market

Pork markets in the NMS were volatile over the last decade, though domestic consumption expanded to 3.3 million tons in 2004. Production, which served mainly domestic consumption, followed closely behind. Exports and imports amounted to 0.3 million tons in recent years.

Trade integration of pork markets in the NMS shows wide divergences. Imports came predominantly from EU-25 countries since most countries imported more than 80 % from these destinations. The export side appears less integrated than many other markets. The Czech Republic, Lithuania and Slovakia exported more than 80 % of their pork to EU-25 countries. The largest pork producer of the EU-10, Poland exported just 20 % to EU-25 destinations and depended heavily on the Russian markets. Hungary, another large pork producer exported about 55 % of its exports to EU-25 countries (Figure 6). The revenue situation of the pig sector will improve slightly in 2005, but investments necessary for the fulfilment of EU requirements (meeting standards) will further increase production costs. Hungarian pork production has a disadvantage in coordinating

production and markets, and the concentration of production in comparison to the most important pork producer member states, which both lead to a decreasing self-sufficiency rate.

Figure 6: Trade integration of pork markets in the new Member States



Source: EUROPEAN COMMISSION (2004): DG for agriculture prospects for agricultural markets and income 2004-2011 for EU-25, Brussels/Belgium, December 2004.

The attractive market conditions in the EU-25 should lead to further trade integration on the export side over the medium term. This increased market integration should reduce the volatility of producer prices recorded prior to accession and improve market conditions. Investments in pork production, in particular in Poland, the Czech Republic and Slovakia, have started to change the competitiveness of the sector. Investments and favourable feed prices suggest that pork production could expand and the competitiveness of the production and processing sectors could increase.

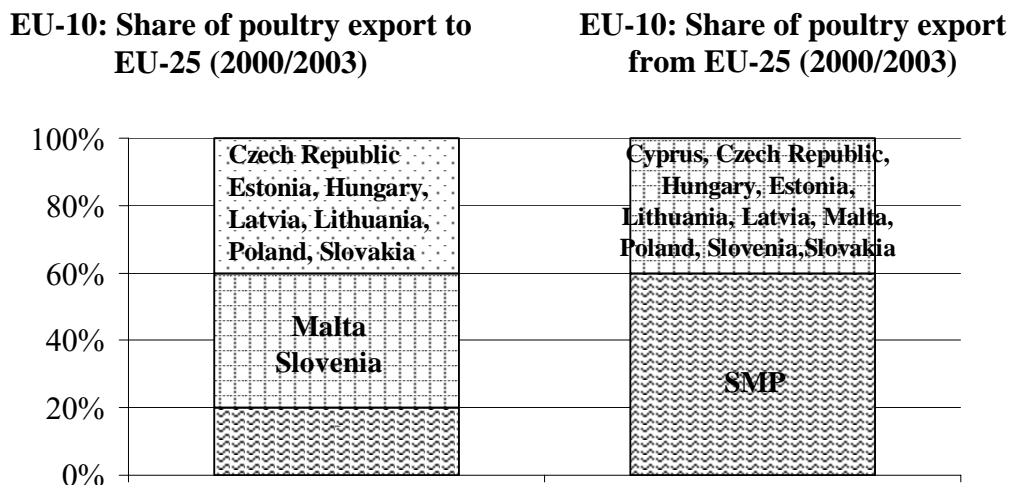
Under these conditions, production of pork in the NMS could increase from the current level of 3.3 million tons to 4 million tons. New production technologies will lead to lower production costs thanks to improved feeding efficiency. Consumption is expected to rise from the current level of 3.3 million tons to 3.6 million tons in upcoming years.

Poultry market

During the last decade, the demand for poultry nearly doubled, showing an increase from 0.9 million tons to 1.7 million tons. These markets, as well as good investment conditions, led on average to significant gains in productivity and competitiveness as compared to the old Member States. Production followed the increase in consumption and some export markets were found in the old Member States.

Trade integration of markets prior to enlargement was already very high. More than 80 % of EU-10 exports went to EU-25 countries. Import markets were similarly integrated (Figure 7). After accession, the favourable production and investment conditions in many countries, as well as increasing demand should further expand production, from 1.7 million tons to 2.5 million tons over the next few years. Consumption will increase and exports could expand to 0.6 million tons. The most important destinations for imports will remain Germany, Austria and Italy.

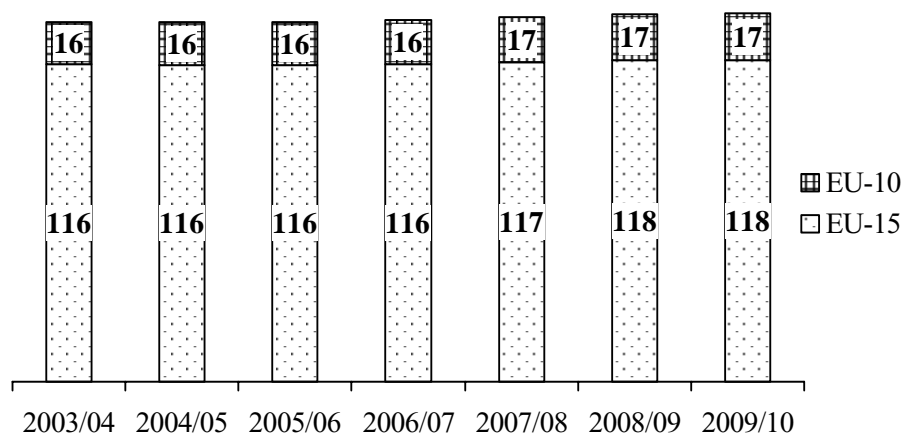
Figure 7: Trade integration of poultry markets in the new Member States



Source: EUROPEAN COMMISSION (2004): DG for Agriculture Prospects for Agricultural markets and income 2004-2011 for EU-25, Brussels/Belgium, December 2004.

Dairy market

Milk production in the NMS has gradually declined, falling to 20 million tons in 2004. Deliveries and registered direct sales accounted for 17 million tons, which is not expected to increase in upcoming years (Figure 8). The marketing quotas associated with enlargement restrict the growth in milk production in the NMS, resulting in a decline in milk production. Even at these reduced production levels, total milk output remains above the total marketing quota for the NMS, reflecting a continued, relatively high on-farm use in some countries. The bulk of the change in milk production will be accomplished through declines in dairy cow inventories.

Figure 8: Deliveries in the EU-25 (million tons)

Source: RICHARTS, E. (2004): EU-Osterweiterung, Wie reagieren die Märkte für Milch und Milchprodukte?, ZMP, Bonn.

In 2004, the largest producer of milk in the NMS was Poland, with 11.5 million tons, followed by the Czech Republic with 2.8 million tons, Hungary with 2 million tons and Lithuania and Slovakia with 1.1 million tons each (Table 5).

Table 5: Milk quotas in the NMS

| | Basic milk quota | 2004/05 | New quotas from 2008/09 |
|----------------|------------------|-----------|-------------------------|
| Cyprus | 145.2 | 145.9 | 150.3 |
| Czech Republic | 2,682.1 | 2,695.6 | 2,831.8 |
| Estonia | 624.5 | 627.6 | 668.2 |
| Hungary | 1,947.3 | 1,957.0 | 2,058.2 |
| Latvia | 695.4 | 698.9 | 753.0 |
| Lithuania | 1646.9 | 1,655.2 | 1,762.5 |
| Malta | 48.7 | 48.9 | 50.4 |
| Poland | 8,964.0 | 9,008.8 | 9,693.9 |
| Slovakia | 1,013.3 | 1,018.4 | 1,076.3 |
| Slovenia | 560.4 | 563.2 | 596.3 |
| EU-10 | 18,327.9 | 18,419.9 | 19,640.9 |
| EU-15 | 118,892.7 | 119,374.1 | 122,741.8 |

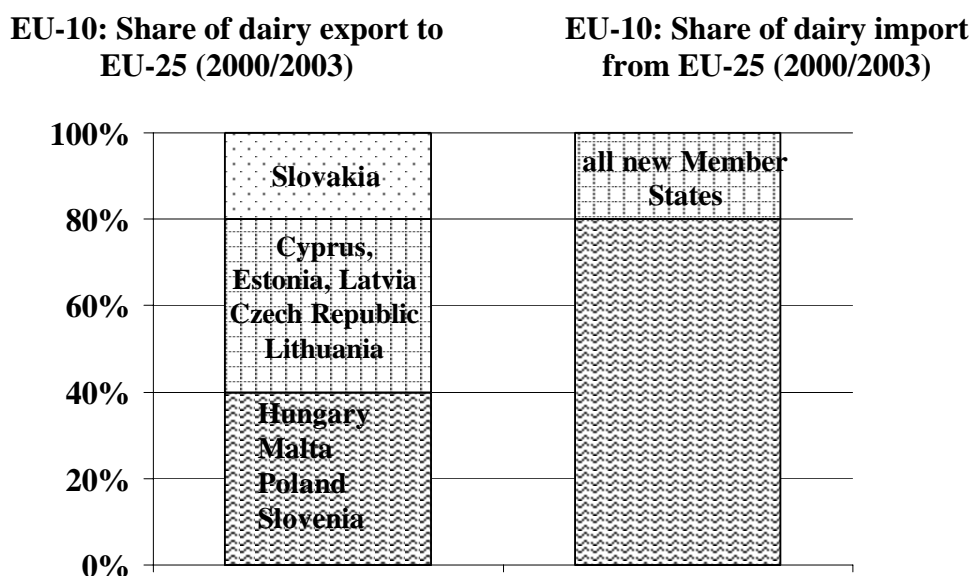
Source: DG AGRI, Brussels/Belgium.

The structure of production varies significantly between countries. In a number of NMS such as Poland, Latvia, Lithuania and Slovenia, the subsistence sector represents an important part (10-20 %) of milk production. Market-oriented milk producers have to operate and compete for markets and resources alongside this subsistence sector. Other countries like Hungary, the Czech Republic, Estonia, and Slovakia are characterised by commercial milk production in larger units. Market-oriented milk production will expand with the ongoing pace

of investments. Subsistence production will continue to decline but will leave additional markets of liquid milk for domestic production.

Trade integration is not very high on the export side, but is well-integrated on the import side. The large milk producers, Poland, Hungary, Lithuania, the Czech Republic, and Slovakia, export to destinations other than EU-25 countries (Figure 9). Further increases in market integration on the export side will depend on the competitiveness of products such as cheese.

Figure 9: Trade integration of dairy markets in the new Member States



Source: EUROPEAN COMMISSION (2004): DG for Agriculture Prospects for Agricultural markets and income 2004-2011 for EU-25, Brussels/Belgium, December 2004.

3 CONCLUSION

Despite increasing integration, markets in the EU-10 appeared to be limited regarding the ability to absorb and stabilise volatile agricultural production. This had a particular effect on Hungary – the largest exporter – and on Poland – the largest producer of agricultural commodities of the NMS.

In Poland, producer prices in agriculture have generally developed well. Investments have increased both in the agricultural and food industries. However, due to rapidly changing economic and institutional settings, it is doubtful for farmers whether the conditions will continue to be that favourable.

The value of both agricultural exports and imports has increased in Hungary in recent years. The rate of the increase of imports will exceed that of exports, though the agricultural trade balance will remain positive, albeit with a decreasing trend. The development of the HUF/EUR exchange rate will have a significant impact on the development of agricultural production and trade. Hungary, as a

net exporter of agricultural commodities, imposes additional challenges to the downstream sector. Processors and traders specialised on crops, as well as fruits and vegetables, use their organised market power to put pressure on producer prices. The lack of competition in the downstream sector may result in restructuring costs being imposed on farmers. Farmers have been disappointed so far due to the short-term development of markets and the lack of information on the CAP. Uncertainty about the possibilities under the rural development plan, the final amount of the top-up of direct payments, as well as the general lack of specific information on the CAP were among the biggest concerns of farmers. Crop production will generate 93-95 % of the total income in agriculture; animal production will have a share of 5-7 %.

Significant impacts will be induced by the enlargement of the European Union, particularly for the NMS through policy and price changes in the dairy, sugar, and cereal markets. Intra-trade effects from enlargement are significant and are caused by changes in consumption and production rather than by changes in the intra-protection structure. The new prices faced by consumers and producers in the NMS are the major cause of this reallocation. In general, consumers in the NMS pay more for their food since accession. There are some changes in trade in the NMS because of major domestic changes, such as in beef trade. As a result of enlargement, the further adjustment of production and consumption will take place in the EU-25. Adjustment will include the development of sufficient export infrastructure in the cereal sectors of the NMS, development towards meeting standards and competitiveness of pork and milk production, as well as that of the meat processing industries.

The market impact of enlargement has been very positive for the NMS. Agricultural production will stabilise in milk and dairy production and increase in the cereal and meat sectors. The NMS will be able to gain additional market shares in the EU-25 in the area of cereals, poultry and beef. However, some market inefficiencies still exist regarding infrastructure and standards of production. Effective integration into the single market should depend partly on the development of production and marketing infrastructure and partly on the compliance of production with EU standards in a cost efficient manner.

Agricultural markets will benefit from the trade creation effects of integration into the Single Market and from the decoupled support through the CAP. Regarding decoupling, member states are expected to implement CAP reform in different ways, which will result in various degrees of decoupling. Changes in the set-aside policy in the NMS will also have an impact, inducing reductions in supply, yield growth assumptions, relative price movements of commodities and their substitution ramifications – both on the demand and supply sides – as well as feed use and animal number interactions. As a result of lower prices, the production of wheat, corn, and barley commodities in the EU-15 will decrease slightly.

The concentration of land use has increased after enlargement, and will continue in the upcoming years. Changes in the structure of agricultural production will have an impact on agricultural employment as well. The pressure to improve efficiency will threaten even more jobs in agriculture in the future than in the past.

Agriculture as both market- and subsistence-oriented is an important phenomenon in a number of countries, in particular in Poland, Latvia and Lithuania. Subsistence farmers obtain little alternative income from social security systems and from employment outside agriculture. They basically produce for their own consumption and, to a lesser extent, for direct sales. Restructuring the subsistence sector depends on the revival of rural economies and responds only marginally to agricultural policy measures directed to markets and income. With EU accession, funds have become available to contribute to the revival of rural economies, if these funds are well-managed and targeted.

Due to the steep competition in the EU, small-scale producers and producers unable to meet community requirements (standards) will be forced to give up agricultural production. Decreased production in the concerned sectors may lead to decreasing output of the processing industry as well. Thus, the creation of alternative income sources in the affected regions is of great importance.

REFERENCES

- RICHARTS, E. (2004): EU-Osterweiterung, Wie reagieren die Märkte für Milch und Milchprodukte?, ZMP, Bonn.
- EUROPEAN COMMISSION (2004): DG for agriculture prospects for agricultural markets and income 2004-2011 for EU-25, Brussels/Belgium, December.
- HORN, P. (2003): Agrargazdasagunkrol a csatlakozas elott történelmi tavlalban, <<http://www.karpatalja.org.na>>.
- KISS, J. (2002): A magyar mezogazdasag világgazdasagi mozgastere, Akademiai Kiado, Budapest/Hungary, pp. 406.
- KSH: Hungarian Central Statistical Office.
- POPP, J., POTORI, N., UDOVECZ, G. (2004): A közös agrarpolitika alkalmazasa Magyarországon, *Agrargazdasagi Tanulmányok*, (5), szám, Agrargazdasági Kutató és Informatikai Intézet, Budapest/Hungary.

REGOVERNING AGRIFOOD MARKETS IN CEEC – POLAND'S PORK AND APPLE MARKETS¹

*JERZY WILKIN**, *MAŁGORZTA JUCHNIEWICZ***, *DOMINIKA MILCZAREK****

ABSTRACT

The paper presents the evolution of the agro-food chain in Poland using the example of two important food products: Pork and apples. The paper analyses the inheritance of the former economic system, the influence of the transition period and the current situation in the fruit and pork markets. The goal of the research is to show links between producers, the processing sector and distribution networks. The paper focuses on the position of small producers, their possibilities of self-organisation and the public support they receive. In addition, the results of a preliminary survey are presented, which stress the most important problems of small producers: Poor institutionalisation, especially in the area of self-organisation and very limited access to modern knowledge and technology. As a result, thousands of farms have reduced their ties with the market and produce only for the needs of their own farm households. There is lack of well-defined and efficient public support for small producers, most of whom feel like losers in the process of post-communist transformation and market reform.

Keywords: *Agro-food chain, apple market, pork market, Poland.*

¹ The research was conducted in the framework of "Regoverning Markets" Project.

* Department of Economics, Warsaw University, Poland, Email: wilkin@wne.uw.edu.pl.

** Department of Economics, University of Warmia and Mazury in Olsztyn, Poland, Email: malgorzata.juchniewicz@uwm.edu.pl.

*** Department of Economics, Warsaw University, Poland, Email: milczarek@wne.uw.edu.pl.

1 INTRODUCTION

The structure of the Polish agro-food chain has changed dramatically during the post-communist transformation. During the socialist period, 75 % of land was in the private sector, which was a unique phenomenon in the Soviet block of countries. State control over the farming sector imposed several measures: Price control, establishing area limits to agricultural holdings, collectivisation (turning private property into state and cooperative property) of upstream and downstream sectors, administrative rationing of industrial inputs for farms, etc. State and cooperative companies, subordinate to the central planning bodies, controlled the wholesale and retail trade of agro-food products. Due to shortages of basic food products during the martial law period in the 1980s, a rationing system for primary food products was established. This system was abolished by the last communist government in July 1989. Price liberalisation was then started in Poland in area of agricultural and food products, the first act of market reforms preceding a whole package of systemic reforms introduced on January 1st, 1990 (known as the "Balcerowicz Plan").

In the first stage of market reforms, hundreds of thousands of small shops and processing plants were established in food production and trade. Later, they become the subject of concentration and competition from large international companies. After 15 years of transformation, over 98 % of trade is now in the private sector. In 2002 there were 845,000 retail sales outlets, including some 450,000 shops, or 45 people per sales outlet, and 85 people per shop. There are 174,000 shops selling food and beverages (GUS, 2003).

During transition, the share of agriculture in gross domestic product (GDP) decreased from 14.5 % in 1988 to 3.9 % in 2002. In the same timeframe, food processing and trade developed quickly, and now the food industry is the largest in the Polish economy: Its share in the nation's gross production in 2002 reached 6.7 %. The food industry (including beverages and tobacco) is the largest branch of the Polish manufacturing sector, with a share of almost 20 % (URBAN, 2004, p. 11). Agri-food products do not play an important role in foreign trade in Poland: Their share of exports in 2003 was 8.4 %, and of imports, 5.9 %. The balance of trade in agri-food products has been negative during most of transition period, reaching a positive value of almost USD 500 million in 2003 due to the highly dynamic trade in processed food (ANALIZA, 2004, p. 265).

The Agricultural Census of 2002 shows that there are 2,933,000 agricultural holdings, of which 1,896,000 operate on 1 hectare or more. Almost 10.5 million people live in households that use agricultural land, which is 27.4 % of the nation's population (PSR, 2002). Over 40 % of farms, especially smaller ones, produce mostly for their own needs. The average area of a farm is 5.76 ha, and in the group of farms with 1 ha or more, the average size is 8.44 ha. There are strong ties between the farm and households. In farm families, the self-supply of food is

very important: It amounted to 50.9 % of all food consumption in 1993, dropping to 38.8 % in 2002. The share of self-supply in food consumption for all households in the country declined from 14.8 % in 1992 to 8.1 % in 2002 (URBAN, 2004, p. 35). It remains, however, much higher than in other EU member states.

The average Polish family spent 26.6 % of its income for food, beverages and tobacco in 2002 (GUS, 2003). This share decreased from 40 % in 1989. In the 1990s, the agro-food industry was a primary target of foreign direct investments (FDI). FDI in the Polish food industry jumped from USD 1 886 million in 1994 to USD 6 402 million in 2002² (URBAN, 2004, p. 110). Growth of FDI over the years 2000-2003 slowed; the value of FDI in fruit and vegetable processing (to the end of 2002) was USD 318 million and in meat processing, USD 483 million.

In the period from 1996-2000, 112 hypermarkets opened in Poland. The share of modern distribution channels, which include hypermarkets, supermarkets and discount stores have been increasing quickly. This share increased from 18 % in 1998 to 32 % in 2002 (RETAIL, 2004, p. 69). In Spain it took 20 years to establish a similar number of hypermarkets. It is estimated that in 2010 the share of large retail networks in Poland will reach 75-80 % of retail trade, as it is now in West European economies. Recently, hypermarkets operating in Poland started to export Polish food products to their chain stores in other countries (RETAIL, 2004). The expansion of large international retail chains generates conflicts in some places with representatives of small, traditional stores. There were several campaigns on the national and local level aimed at stopping the localisation of new hyper- and supermarkets, as well as restricting their operation on Sundays. These campaigns have not achieved noticeable success.

2 EVOLUTION OF THE FOOD CHAIN IN POLAND: THE CASE OF APPLES AND PORK PRODUCTION

The evolution of the agro-food chain is analysed through two important food products: Pork and apples. Pork is the most popular meat in Poland, and the country is the 4th largest pork producer in the EU and 6th largest in the world. Poland is also one of the largest apple producers in the EU. Every fourth litre of apple juice in the world is produced from Polish apple extract. In short, Poland is a significant exporter of both products, especially for the UE market.

² These amounts include only investments over 1 USD million.

2.1 Characteristics of the Polish apple market chain

2.1.1 Inheritance of the former economic system and transition period on the fruit market

Before the current systemic changes, private farmers dominated fruit and vegetable production, food-processing plants belonged to the so-called socialised sector³ and distribution networks consisted of both a private and socialised sector. Cooperatives were responsible for purchasing fruits and vegetables for the processing sector, export and partially for the internal market. Cooperatives were also responsible for providing several services such as storing, packing and transport, as well as the delivery of inputs.

According to a law from 1990, the headquarters of horticulture and apiarian cooperatives were liquidated. After the dramatic collapse of horticulture cooperatives, the traditional relationships between fruit market participants were broken. This resulted in the weaker position of most fruit-growing farms and contributed to increased competition between them (HALICKA, 2002; PIZŁO, 2002). To adapt to free market conditions, market-oriented fruit producers started to intensify production and to modernise their farms. This resulted in increased production levels and improved the quality of fruits.

Due to the liberalisation process, traditionally export-oriented large state companies lost their dominant position. The fall of eastern markets created the necessity of looking for new foreign partners. In addition, growing domestic demand for processed fruits and vegetables in the beginning of 1990s allowed for the emergence of many small processing plants. Processed fruit and vegetable production has been increasing in Poland since the beginning of 1990s, with the most dynamic development observed since the mid-1990s due to increased foreign investment⁴ (HALICKA, 1999; KULISZ, 2002). The restructuring and modernisation of fruit and vegetable-processing companies included: A gradual reduction of employment in former state-owned companies; seeking permanent commercial partners; strengthening vertical connections; improvement of quality; increasing degree of specialisation, etc. (HALICKA, 1999; PLOCHARSKI et al., 2002).

In the 1990s, changes in the fruit and vegetable (and food in general) distribution systems were influenced by the de-concentration of horticulture cooperatives, dispersion of wholesale trade and an increasing number of alimentary shops (PIZŁO, 2001). Also in the 1990s, the number of purchasers increased and new purchasers (super- and hypermarket chains) entered the market, which substantially changed conditions on the market. Fruit exchanges stopped playing an important role, while the platform of market chains took over their tasks. Also,

³ Socialized sector included cooperatives and state-owned companies.

⁴ Both as a result of green field investment and the privatization of state companies.

producers started to sell directly to supermarket chains and fruit processing companies.

During the first years of transformation, the most important problems of producers, processing companies and distribution networks on the fruit market were the low level of stability on the market and an inefficient institutional environment.

2.1.2 Current situation on the fruit market

Production structure

Fruit and vegetable production is an important branch of the agricultural sector in Poland, amounting to around 12 % of total agricultural production for sale. Arable land under fruit and vegetable growing covers around 640 thousand ha (4 % of the total farmland in Poland) including orchards of 270 thousand ha (around 1.6 % of total farmland). Apple production dominates: It is conducted on over 50 % of orchards' area (PSR, 2002; RYNEK OWOCÓW, 2004).

Apple crops reach 1.6-2.4 million tons per year. In 2003, it amounted to around 2.43 million tons. The highest share of apple production originates in central and southeast Poland⁵. Despite a steady increase in apple production, large fluctuations in the size of crops occur because of climate conditions and uncoordinated decisions of farmers. This results in significant price fluctuations (KUBIAK et al., 2002; RYNEK OWOCÓW, 2004).

From 1992-2000, around 40 % of total fresh fruit production in Poland was delivered directly for consumption, around 40 % was processed and 10 % was exported.⁶ However, the share of processed fruits is increasing – in 2001 it reached 50 % of total fresh fruit production and it currently amounts to around 60 % of total fruit crops (KUBIAK et al., 2002; RYNEK OWOCÓW, 2004).

The majority of land under fruit production is owned by the private sector. In 2000, 96.8 % of orchards' area belonged to private owners and 3.2 % to the state sector. Cooperatives operated 0.6 % of orchards' area, while foreign owners accounted for just 0.1 %. Individual farmers comprised 92.6 % (KUBIAK et al., 2002).

Currently, fruit production is very dispersed. According to the Agricultural Census conducted in 2002, there were around 242,000 farms⁷ producing apples and apple production covered over 147,000 ha⁸. Most of the apple producing

⁵ In Mazowieckie voivodship, around 51 %, Lodzkie voivodship, 11 % and in Lubelskie voivodship, 10 % of total production in 2001 (KUBIAK et al., 2002).

⁶ The remaining 10 % of total fresh fruit production was spoiled or used for non-consumption purposes.

⁷ I.e. around 8 % of the total number of farms in Poland.

⁸ I.e. around 1 % of the total farmland in Poland.

farms (28 % of apple-growing farms) were very small (having a total farm area of less than 1 ha). However, their share of apple production was very small. The area of apple growing in these farms covered only around 4 % of the apple orchards' area. Most apple production was concentrated in small and average farms operating from 5 to 15 ha of farmland (27 % of the total number of apple-growing farms) and covering almost 50 % of the total area under apple production. However, farmers who have apple orchards are diversifying their production. The majority of them have less than 1 ha of apple orchards (87 % of total number of apple-producers) (PSR, 2002). Only around 10 % of farmers with apple orchards are specialised in apple production. This can be explained by the unstable situation on the apple market in Poland.

The very dispersed structure of producers, lack of capital necessary for investments in farms and insufficient storage capacities influence the bargaining position of apple producers. The main problems of apple producers are highly fluctuating prices, unstable production conditions, high level of competition and problems with marketing of their products.

In the case of processing apples, the main distribution channels for apple-growing farmers are usually local trading companies and small wholesale companies. The profit margin of trading companies usually amounts to 10-20 %. In the regions with a high level of production and fruit-processing concentration (such as in the central region of Poland) producers also sell directly to fruit-processing companies. The role of trading companies in table apple turnover is very small. Small fruit-growing producers usually sell table apples directly at local marketplaces (around 40-50 % of table apples sales) and to alimentary shops. They usually have oral contracts and prices for their products and sales amounts depend largely on seasonal conditions. Larger fruit-growing producers and members of producers' groups tend to sell table apples directly to large purchasers like super- and hypermarket chains or exporting companies. They usually have written short-term contracts that allows for sales stability and higher prices in comparison to other producers. Usually in the case of table apples, they can receive around 70 % of the final price. However, they have to adapt to long payment periods and high purchasers' requirements on quality, short terms of delivery, etc. This shows the relative bargaining superiority of supermarket chains over producers⁹.

Despite the existence of many branch organisations and associations, a very low level of economic cooperation between producers characterises the fruit and vegetable markets. Current producers' associations and horticulture cooperatives very often have organisational and financial problems and do not fulfil their statutory tasks.

⁹ Data were obtained from own survey and interviews with experts from IERiGŻ (Institute of Agricultural and Food Economics).

Fruit-processing sector

Fruit processing production is dominated by the production of juices and beverages, chilled fruits and fruit juice extracts (mainly condensed apple juice). They constitute around 15 % of total Polish exports of agricultural products. Prices of chilled fruits and vegetables and of apple juice extract (products with a very high share in exports) fluctuate significantly according to the situation of demand and supply on the European and world markets. This results in important changes in the economic situation of processing companies during the given years. However, due to production concentration, the financial situation of fruit and vegetable processing companies has improved in recent years (KULISZ, 2002).

There are around 1,300 fruit and vegetable processing companies in Poland; most of them (90 %) are small firms employing less than 50 persons. Large companies with more than 100 employees constitute around 2 % of the firms. Most fruit and vegetable processing companies are located in central Poland, which is in the region of the highest production concentration. In all branches of fruit and vegetable processing (except pickled and dried vegetables) foreign capital dominates (KULISZ, 2002).

The increase in production of processed fruits and a lower demand on the domestic market in recent years has resulted in lower prices and the emergence of a group of effective processing companies. Competition is causing a concentration of production and an increase of market share for a group of leaders (HALICKA, 1999).

Distribution networks

Changes in fruit and vegetable distribution in Poland were influenced, to a large extent, by the transformation and integration process with the EU. Just as in the case of the production and processing sector, a high level of dispersion characterises the wholesale and retail trade of fruits and vegetables.

Due to the deregulation of the storage sector in the beginning of 1990s, small, independent wholesale companies developed and are currently dominating the market. According to the Central Statistical Office data, there are around 3,800 companies for which fruit and vegetable trade is the main activity. The small wholesale companies usually deliver fruits and vegetables to fruit-processing companies, as well to local market places in towns. The role of local market places, whose number increased significantly in the beginning of 1990s after the liquidation of traditional distribution channels, is currently diminishing. In retail trade, the number of alimentary shops increased significantly in the 1990s and reached the number of around 140,000, while the number of specialised fruit and vegetable shops (very common in Poland prior to the 1990s) decreased to about 6,700 in 2000 (HALICKA, 2002).

Changes in trade structure were also forced by the quick development of large, international super- and hypermarket chains. According to Pizło, super- and hypermarket chains in Poland are not able to compete with small local market places with fresh fruits and vegetables, as the chains' variety is limited in comparison, especially during summer season (PIZŁO, 2001). However, their share in total retail turnover of fruits is increasing, and currently amounts to 25 %¹⁰ (TRZĘSOWSKI and WAWRZY尼亚K, 2002).

As a consequence of the high level of dispersion and the lack of coordination between participants on the market, distributional networks for fruits and vegetables are not effective (PIZŁO, 2001). However, the process of further concentrating the wholesale and retail trade can be expected to occur in the next 10 years. Therefore, the importance of traditional local market places, as well as of general alimentary and specialised vegetable and fruits shops will diminish while modern wholesale markets will improve their position. In addition, the development of producers' groups of fruit and vegetable-growing farmers will allow for larger participation of so-called primary markets¹¹, i.e., local wholesale markets located in regions where fruit and vegetable production occurs. It is estimated that the role of super- and hypermarket chains will increase significantly and even reach a 50 % share of total fruit retail turnover by 2010 (TRZĘSOWSKI and WAWRZY尼亚K, 2002).

Results of a preliminary survey with apple producers and representatives of fruit processing companies

A pilot survey with apple producers and representatives of fruit processing companies was organised in two regions of Poland: Central Poland, where the largest share of fruit production is concentrated (and which is also called the "largest orchard of Europe") and in the southeastern region of Poland (close to the Ukrainian border).¹² The survey covered the following issues: Influence of the transition period on production conditions, the current situation and future developments on the market, the influence of government policy and accession to the European Union.

According to the survey results, there are two important factors influencing opinions on problems related to apple production and marketing, as well as on the economic situation and the developmental possibilities of farms: Farm size and membership in a producers' group. The smaller farmers, not associated in any producers' group, tend to perceive their situation as difficult mainly because of a lack of capital necessary for investment and a lack of influence on the market.

¹⁰ These are rough estimates because of the lack of detailed information about the amount of products traded through different distribution channels (TRZĘSOWSKI and WAWRZY尼亚K, 2002).

¹¹ These markets are also called producers' markets (PIZŁO, 2001).

¹² 11 interviews were made in the central region, and 10 in the southeastern region.

In general, the most important issues for fruit producers in both the surveyed regions are problems with marketing of products and the fluctuation of prices. All interviewed persons agreed that small farmers not associated with any producers' group or cooperative have no chance to survive and develop. They emphasised that there is a strong need for modernising production, specialisation and improving the quality of products.

Farmers from the central region of Poland have already benefited from accession to the European Union (EU) (thanks to the SAPARD program and a higher demand for their products) and therefore they evaluate it much more positively than do farmers from the southeastern region. In both regions, apple producers expect government policies to support stable prices (i.e., contracting and minimal prices) and farm modernisation (i.e., better access to credits). Such policies will improve the bargaining position of producers vis a vis supermarket chains and fruit processing companies, which (in the opinion of farmers) dictate conditions on the market¹³.

A comparison of pilot studies' results with farmers and representatives of fruit processing companies stresses the problem of a dispersed production structure and underdeveloped producers' organisations (like producers' groups). According to the interviewed persons, a stronger relationship (including long-term contracts) would be beneficial for both producers and purchasers.

Membership in producers' groups allows for more stable production and marketing conditions. Farmers who are members of producers' groups have written, usually unlimited contracts with large companies such as supermarket chains, exporting companies and fruit processing companies. Independent farmers not associated in any producers' groups or cooperatives very often sell to casual purchasers (i.e., trading companies) or based on oral contracts. Therefore, small independent farmers evaluate their position as very weak; they cannot enforce the terms of contracts and do not see any sense in applying for a court trial.

In general, fruit processing companies' representatives complain of a dispersed production system which results in fluctuating quality (acidity of apples) and unstable deliveries. Apple producers are unable to estimate the amount of their production as well as shares of production for consumption or processing. To guarantee supplies, some fruit-processing companies enter into a tight cooperation with producers and support them in producing specific sub-species of apples needed for juice extract production. The manner of support includes training, crediting (by delivering means of plant protection), providing seedlings, etc.

Results of the survey suggest that the next research steps should include an extended analysis of contracts and the creation of producers' groups. If possible,

¹³ By imposing strong requirements such as a very short time frame for delivery, very high quality requirements, etc.

the survey will also include other actors (such as representatives of super and hyper-market chains, and small wholesale companies).

2.2 Evolution of the agro-food market during post-socialist transformation – The case of the pork market

2.2.1 Inheritance of former system

Large state-owned companies or cooperatives, associated in headquarters, were the main economic units in the meat-processing and distribution sectors of the centrally-planned economy in Poland. The headquarters managed these companies directly or indirectly using common administrative methods. Therefore, a high level of concentration characterised this structure.

Government policy concerning the purchase of pigs for slaughter included compulsory deliveries from 1945-1971 (except the years 1947-1951) and a contracting system. The goals of this system were: The enlargement of the pig population and an increase of purchasing by providing incentives, especially for small and medium-sized individual farmers, for selling animals to so-called socialised (state-owned and cooperative) purchasing centres. From 1946-1980, the pig population increased from around 2.65 million to around 21 million heads. However, economic problems in the 1980s caused a reduction of feed imports and an unbalanced production of pigs for slaughter; this resulted in the state control of food. In a situation of meat shortages on the market, the sale of the whole output of pig producers and state-owned meat processing companies was secured. The profitability of producing pigs for slaughter was assured by maintaining a given price relationship between pigs and other agricultural products, e.g. grain and potatoes. Artificial price relationships were controlled by state agencies. Such a policy created a very large demand for agricultural products, including meat and processed meat. The continuous surplus of demand resulted in a good economic situation of all small and medium-sized farms. These circumstances did not force farmers to introduce technological progress, to compete by decreasing costs, or to improve the quality of their products.

Only in 1982 were prices admitted to be decisive parameters. As a result of reforms, three types of prices were introduced into the food processing sector: Administrative, regulated and contractual¹⁴. Even though from 1982-1989, prices became an active instrument on the market, they did not play their role entirely. This was caused by the strong influence of other instruments on the market, such as state controls, central accounting and distribution, subsidies and

¹⁴ Administrative prices were decided on the central level based on average production costs in a given branch. Regulated prices covered a very small group of products which were recognized as important for society, but which were not decided upon regarding value of food expense. Other products had contractual prices, i.e., decided by producers and negotiated with purchasers (retail companies) without state intervention.

tax exemptions. In the case of meat, a distribution system based on ration-cards was also played a very important role. The low efficiency of the market did not allow for either substantial production increases or a market balance.

2.2.2 Characteristics of the transformation period and current market structure

As a result of the 1989 reforms, systems of contracting, the administration of prices, the distribution of inputs, and subsidising production and consumption were all cancelled. Thereafter, the relations between actors in the food chain has been changing very quickly. There was a concentration process in the procurement, processing and trade sectors and the position of these elements of the food chain has strengthened. The costs of these adjustments have mostly been paid by farmers. In general, the transition period of the meat market can be characterised by three stages. During the first stage (1988-1992) sharp price changes and systemic changes in production and trade structures occurred. In the second stage (1992-1998) there was a fast process of privatisation and modernisation of the meat-processing industry. The third stage (1998-2003) was dominated by adjustments to EU conditions.

Currently, one can observe a growing structural asymmetry on the meat market. On both ends of the food chain there are numerous groups of actors, i.e., 1.1 million producers of primary products (farmers) and 12 million households. These groups form a highly competitive environment. In the middle there are the processing plants and traders, characterised by a growing level of concentration. In some regions, food processors or procurement companies have quasi-monopolistic positions and can dictate delivery prices and increase profits at the cost of agricultural producers.

Production structure

Pig production in Poland is concentrated in private, usually small, family farms which have limited production capacities. In 1986, pig breeding was conducted on 70 % of farms, and in 1996, on 50 % of farms. Thus, within 10 years, the number of pig producers fell from 1.66 million to 1.09 million, i.e., 35 %; but it is still very large. From 1986-1996, the average pig population per producer increased from 8 to 14 heads, i.e., by 75 %, but its level is still low. This is caused by the small scale of pig production in farms smaller than 10 ha, which dominate pig breeding. The average pig population of these farms amounted only to 7 heads in 1996, while in farms of 10-15 ha it was 20 heads; in farms over 20 ha it was 42 heads. Almost 90 % of farms breeding pigs have up to 49 pigs per farm. The average number of pigs in the largest farms increased by 110 %, and their share of total population increased from 25 % to 40 %, i.e., from 3.4 million to 6.1 million heads. Sixteen percent of the population were in herds of less than 10 heads, 46 % in herds up to 50 heads, 17 % in herds from 50 to 100 heads, and 21 % were in herds of over 100 (JUCHNIEWICZ, 1998). In the EU, concentration

in pork production is high; there were 1 million farms producing pork in 1997. Over 50 % of production comes from farms of over 1,000 heads, and an additional 25 % from farms with herds over 400 (MALKOWSKI and ZAWADZKA, 2000).

It is very important for producers of pork to be integrated with meat processing companies. Those who do not contract with these companies receive at least 10 % lower price for pork deliveries. There is also an economy of scale benefit for bigger producers. It is estimated that the difference of costs between small and large producers is about 15 %. Meat processing companies are interested in contracting with larger producers that deliver products of high quality in large amounts. For small producers, the alternatives are to get bigger or to establish producer groups with other similar producers.

However, the process of pig producers' organisation is very slow. Currently, there are only 5 registered producers' groups and 93 unregistered ones on the pig market. The main reasons for this are the attitudes of farmers (distrust of partnerships and cooperatives, tradition of individual activity, negative past experiences); economics (large capital diversity of agricultural producers, unwillingness of strong farms to participate in organisations which also include weak farms); lack of cooperation patterns in rural society; and the lack of leaders who would undertake the organisation of producers' groups. It is expected that the processes of farm integration will proceed in an evolutionary way, as producers gain knowledge and change their attitudes toward cooperation (KNOBLAUCH and LIZIŃSKA, 2003).

Before Poland's accession to the EU, there were significant differences between the level of support for pork producers in Poland and in EU. The Polish government's main intervention instrument on the pork market before accession to the EU was the purchase of meat conducted by the state Agency for Agricultural Market (ARR). Purchased pork was offered on the domestic market or for export, depending on the market situation. Poland's accession to the EU forced the Polish government to significantly change the support system for meat products.

Meat-processing industry

The privatisation of state-owned companies in the meat industry was completed by 1998. A group of leading sector companies has emerged, both from privatised companies as well as from small and medium-sized companies, which were created during the first phase of transformation. This was also the period of large investment, significant inflow of foreign capital and the improvement of their financial situation.

During the last years of transformation, in the so-called second restructuring phase, meat-processing companies began to reduce redundant resources and to limit production profiles. From 2002-2003, they also accelerated the investment process to adapt to sanitary requirements in the EU, to implement quality systems

and to extend integration with pig producers. Contracting in the pig sector has been developing with increased competition since the mid-1990s. Currently, the best meat-processing companies use contracting to stabilise deliveries and to influence the quality of pigs for slaughter. The meat industry has again started to organise its own source of raw materials, to influence development and to reorganise agricultural structures.

However, meat processing is also dispersed in Poland. There are 4,200 firms in this branch of the food industry. 2,800 firms are dealing with slaughtering and cutting up of animals, 2,650 process red meat, 650 produce minced meat, and 70 deals with the storage of meat. 870 meat processing plant employ over 5 people each. Among them there are 350 plants of medium and large size employing over 50 people each. Large and medium-sized plants control 41 % of slaughtering and 60 % of meat processing. The level of specialisation in the meat industry is relatively low. Utilisation of production capacity in meat processing plants is also at a low level and in most cases does not exceed 60 % (in slaughtering pigs – 45 %, slaughtering cattle – 25 %, processing – 50 %, production of ham, sausages. etc. – 33 %). Technical and technological standards of the meat industry are differentiated. Usually, high standards are found in processing plants and significantly lower are found in slaughtering houses. The Polish meat industry is based mostly on domestic capital. Significant progress has been achieved in the last several years in the implementation of technological knowledge, development of domestic production of machinery for the meat industry, the durability of products, hygienic standards, packaging, labelling and the standardisation of deliveries (JUCHNIEWICZ, 1997).

European integration has had an important impact on the meat processing sector. In 2003, investments in the meat industry reached USD 50 million, 50 % higher than the previous year (RYNEK MIĘSA, 2004). As a result of this tendency, the number of plants having licenses to export to the EU market is growing rapidly.

Distribution channels

At the beginning of 1990s, a common feature at all levels of product turnover was the liquidation or significant limitation of previous entities' roles. This was a result of the sale of state-owned and cooperative retail outlets (such as "Samopomoc Chłopska", "Społem", Państwowy Hurt Spożywczy), which dominated the distribution of agro-food products. Small trade companies were created from the former cooperative and state-owned outlets, and newly-founded private entities also overtook their place. The freedom of creating market relationships and the lack of administrative restrictions allowed for the development of new distribution channels in the pork market.

The transformation of the Polish economy resulted in changes in the proportion of registered to unregistered animal procurement. In the first phase of transformation, the integration of relationships between pig producers with meat-processing

companies based on a contracting system collapsed. Rapid developments of small slaughterhouses and processing companies, the weaker position of state-owned companies and the quick privatisation of retail trade companies occurred. The entrepreneurship of small companies, a lack of entry barriers for new entities, and their accessibility to a dispersed retail network all caused the state sector to lose its dominant market position in a very short time. It was also a result of delays in restructuring state-owned companies.

In the 1990s, a brokerage of private wholesale companies became, for meat-processing companies, a basic distribution channel for purchasing pigs for slaughter. Private wholesale companies usually cooperate with small and medium-sized pig producers and with medium and large scale meat-processing companies. Traditional distributional channels in Poland were also local markets. At the beginning of the 1990s, they even played the role of distribution channel for the processing sector. However, their current importance is diminishing in the turnover of meat, even while it is still important for the fruit and vegetable trade.

Exchanges and wholesale markets play a small role in the turnover of agricultural products, including pigs for slaughter and pork. In the mid-1990s, there were tens of these type institutions of local character. At the end of the 1990s, their number had significantly decreased, and 6-8 regional exchanges emerged. Mostly spot transactions take place at these exchanges, unlike in other countries where forward transactions tend to dominate. There is also a small number of transactions and small turnover on these exchanges. In addition, a state agency – the Agricultural Market Agency – has the largest share of total turnover.

Currently, there are 14,000 local wholesalers employing over 5 people each. This is 80 % of all wholesalers on the market. The sector of larger wholesalers included 5 nation-wide wholesale networks, 5 procurement groups, 60 regional wholesale networks and 500 regional wholesale firms. In retail trade, there are 15,000 meat stores, 90,000 grocery stores, 1,800 large network stores and 65,000 catering units. The share of large network shops in the distribution of meat and meat products is around 33 % (URBAN, 2004). Large retailers have the most noticeable impact on improving the quality of products, vertical and horizontal integration and on the rationalisation of the delivery system. They also play a dominant role in consolidating the wholesale and retail trade in the Polish meat market. It is estimated that large food store chains will control 75-80 % of the grocery market in Poland in 2010, a similar share as in West European countries at the beginning of this decade (WRZOSEK, 2002).

The size of procurement price fluctuations for pork and ham decreased in second half of the 1990s, a positive development which shows the declining price risk on the meat market. From 1992-2002, changes in retail prices for meat and meat products were smaller than the change of prices of livestock. The smallest changes can be observed in the case of boiled ham. The meat industry reacts to cyclical and seasonal changes in procurement prices and reduces fluctuations of

retail prices. There is a long-term tendency to decrease the share of procurement prices in retail and meat processor prices. The most unstable are prices at the primary producer level. Meat processing companies have a decisive impact on the price relation between farmers and retailers.

Results of the preliminary survey with pork producers

Results of a preliminary survey with pork producers show that over 70 % of interviewed farmers entered into agreements with purchasers. Among them, 40 % had long-term written contracts, 40 % had one-year written contracts and only 20 % had oral contracts. The contracts between farmers and meat processing companies can cover one or more years and usually include: Minimum delivery/procurement per year, monthly or quarterly delivery amount, minimum pigs per delivery and payment periods for delivered pigs. Multi-year contracts include additional premiums for delivery on time. Additionally, while signing multi-year contracts, meat processing companies offer advisory services regarding animal genetics, feeding, building modernisation, and environmental and veterinary aspects of pig production. Some companies offer also convenient credit lines.

However, almost 30 % of those interviewed did not sign any contract. They explained their decision by citing the possibility of changing purchasers and thus gaining better price and payment conditions. On the other hand, they made attempts to cooperate with other farmers, especially in buying inputs or machinery.

In many local meat-processing companies, direct deliveries from farmers dominated and farmers undertook all costs and risks connected to these deliveries. Results of the survey show that small pig producers usually deliver their products to small meat-processing companies while large farms establish distribution relationships with large companies.

For the interviewed farmers, the most important problems are high price fluctuations and the uncertainty related to market conditions. The other important factors are problems with payments from contractors. In their opinion, market conditions, including price relations on the meat market, are dictated by large meat processing plants and supermarket chains. All interviewed independent pig producers who had signed contracts with meat-processing companies had no influence on prices – the companies decided them. All surveyed farmers declared that the concentration of production is necessary. They are aware that without membership in a producer group, it is difficult to significantly influence the contracting conditions offered by meat processing companies.

3 CONCLUSIONS

The study covers a period of fundamental changes in the economic and political systems in Poland. During the past 15 years, the Polish economy has been transformed and prepared for accession with the European Union. The road from centrally-planned economy to open market economy has required profound changes in all institutional structures of the economy and society. These changes also took place in the agro-food sector. Agricultural and food products were the first in the process of market liberalisation, which started in 1989. In 2003, over 95 % of food processing was in the private sector. Fast modernisation of the food-processing industry has mostly been a result of an inflow of foreign direct investments. In the mid-1990s, over 20 % of FDI in Poland went to the food processing industry; currently it is about 10 %.

A very fast increase in the share of foreign trading companies in the food products market was also observed. Since the beginning of the 1990s, Poland has become an area of fast expansion for large retail store chains. For example, from 1996-2000, 112 hypermarkets opened in Poland. It had taken almost 20 years in Spain to establish similar number of hypermarkets. In 2003, large retail stores controlled about 35 % of the food retail market in Poland. It is estimated that this share will reach 75-80 % in 2010.

The study analyses the evolution of the agro-food chain using the example of two important food products: Pork and apples. Poland is the 4th largest producer of pork and one of the largest producers of apples in the EU. Poland is also a significant exporter of both products, especially for the UE market.

Production of both products is very dispersed. There are over 1 million pig breeders in Poland who keep relatively small herds. This is almost the same number of farms breeding pigs as in the entire EU-15. Most apple-producing farms are diversified. Only 10 % of these farms are specialised in apple production. Over 65 % of farms with an orchard are smaller than 5 hectares and the average size of orchards is only 0.86 ha.

However, the concentration of production is observed due to changes in market structures and price relations. Large producers have much better access to the market and receive much higher prices than smaller ones from retailers and food-processing plants. Pig producers with multi-year contracts with meat processor usually receive a 10 % higher price than other producers. The majority of fruit producers do not have written contracts with fruit processors or food stores. Larger producers and producer groups sell their products directly to large retail stores. Usually, they have short-term contracts with retail store chains or with fruit processing companies for one season, which allows for sales stability and higher prices in comparison to other producers.

There is also a lack of well-organised producer groups in these sectors of agriculture. Cooperation between farmers in the form of producer groups or cooperatives

is developing very slowly. In 2003, there were only five registered producer groups in pig production. Other 20-40 groups were established, but not yet registered. Strong individualism and a slow process of cooperation between farmers in Poland is partially a result of bad experience with collective farming during communist times. Results of the preliminary survey suggest that the next steps of research should include an extended analysis of contracts and a process of creating of producers' groups.

To conclude, Polish agriculture is still dominated by small producers, but their position is weakening year by year. The biggest problems which they face are poor institutionalisation, especially in the area of self-organisation, and very limited access to modern knowledge and technology. As a result, thousands of farms reduce their ties with the market and produce only for the needs of the farm households. There is lack of well-defined and efficient public support for small producers, most of whom feel like losers in the process of post-communist transformation and market reform.

REFERENCES

- Analiza produkcyjno-ekonomicznej sytuacji rolnictwa i gospodarki żywnościowej w 2003 roku (2004): IERGŻ, Warszawa/Poland.
- HALICKA, E. (1999): The state and perspectives of fruit and vegetable processing sector in Poland, *Annals of Warsaw Agricultural University, SGGW, Food Technology, Nutrition and Consumer Sciences, No. 21*, pp. 15-25.
- HALICKA, E. (2002): Przekształcenia na polskim rynku świeżych owoców i warzyw w okresie jego dostosowania do unijnego systemu organizacji, *Zeszyty Naukowe SGGW w Warszawie, Ekonomia i organizacja gospodarki żywnościowej, No. 46 (2002)*, pp. 67-77.
- GUS (2003): Rocznik statystyczny, Główny urząd statystyczny, Warszawa/Poland.
- JUCHNIEWICZ, M. (1997): Adaptacja producentów rynkowych i przemysłu mięsnego do wymagań jakościowych Unii Europejskiej, in: LAGUNA, M. (ed.): *Konkurencyjność polskiego rolnictwa na rynkach międzynarodowych*, Olsztyn/Poland.
- JUCHNIEWICZ, M. (1998): Przychody producentów trzody chlewnej w zależności od systemu klasyfikacji, *Roczniki Nauk Zootechnicznych, Vol. 25, No. 2*.
- KNOBLAUCH, L., LIZIŃSKA, W. (2003): Grupy producenckie alternatywą dla polskich producentów żywca wieprzowego z województw północno-wschodnich, *Akademia Ekonomiczna, Wrocław/Poland*.
- KUBIAK, K. et al. (2002): *Sadownictwo w Polsce (1990-2001)*, Centralny Ośrodek Badawczo-Rozwojowy Ogrodnictwa, Warszawa/Poland.
- KULISZ, B. (2002): Regulacja rynku przetworów owocowych i warzywnych – O projekcie ustawy, *Biuletyn Informacyjny ARR, Nr. 6/2002 (132)*.
- MALKOWSKI, J., ZAWADZKA, D. (2000): Rynek mięsa wieprzowego, in: MAJEWSKI, E., DALTON, G. (eds.): *Strategiczne opcje dla polskiego sektora agrobiznesu w świetle analiz ekonomicznych*, SGGW, Warszawa/Poland.

- PSR 2002 (2003): Raport z wyników Powszechnego Spisu Rolnego 2002, GUS, Warszawa/Poland.
- PIZLO, W. (2001): Rynek owoców w Polsce i wybranych krajach Unii Europejskiej. Ujęcie teoretyczne i empiryczne, Wydawnictwo SGGW, Warszawa/Poland.
- PLOCHARSKI, W., GORCZYŃSKA, TATAJ, Z. (2002): Sytuacja w krajowym przemyśle owocowo-warzywnym, *Hasło Ogrodnicze, Wydanie Specjalne*.
- URBAN, R. (ed.) (2004): Przemiany przemysłu spożywczego w latach 1988-2003, IERiGŻ, Warszawa/Poland.
- RETAIL & CONSUMER (2004): Winning strategies in Russia and Central & Eastern Europe 2003/2004, PriceWaterhouseCoopers.
- RYNEK MIĘSA (2004): Raporty rynkowe IERiGŻ, Warszawa/Poland.
- RYNEK OWOCÓW I WARZYW (2004): Raporty rynkowe IERiGŻ, Warszawa/Poland.
- SKARZYŃSKA, A., AUGUSTYŃSKA-GRZYMEK, I. (1999): Koszty jednostkowe i dochodowość produkcji rolniczej w gospodarstwach indywidualnych w 1998, *Zagadnienia Ekonomiki Rolnej, No. 4-5*.
- TRZĘSOWSKI, M., WAWRZYŃIAK, J. (2002): Propozycja organizacji rynku owocowego w Polsce, *Hasło Ogrodnicze, Wydanie Specjalne*.
- WRZOSEK, K. (2002): Proces dostosowania przemysłu spożywczego do działania w obliczu akcesji do Unii Europejskiej i globalizacji na przykładzie przemysłu mleczarskiego, *Prace Naukowe AR we Wrocławiu, Vol. 963*.

REGOVERNING MARKETS IN THE HUNGARIAN DAIRY SECTOR¹

*IMRE FERTŐ**, *CSABA FORGÁCS***, *ANIKÓ JUHÁSZ****, *GYÖNGYI KÜRTHY*****

ABSTRACT

This paper investigates the issue of regoverning markets in the vertical chain of the dairy sector during the last 15 years. As a consequence of the emergence of multinationals in the food chains, the structure of food wholesaling and retailing has changed considerably. Multinational firms have influenced not only the high number of small- and medium-size retail shops, but food manufacturing firms and agricultural producers as well. We focus on the activities and expansion of supermarkets and the adjustment strategies of small producers. The policy aspects of supporting small producers against super- and hypermarkets and the competitiveness of the dairy sector are also discussed.

Keywords: *Supermarket chains, dairy sector, competitiveness, regoverning markets.*

1 INTRODUCTION

During the last 15 years, food chains have been considerably restructured in Hungary. The privatization of state owned, centrally-managed retailing outlets, a resulting high number of small retail shops, the privatization of national food wholesaling and retailing, and green field foreign investments in the sector have all resulted in a new structure in the Hungarian food chain. Moreover, a concentration on the supply side has also influenced the relationship among market players within the vertical chain. These changes have significantly affected both

¹ The research was conducted in the framework of "Regoverning Markets" Project.

* Institute of Economics, Hungarian Academy of Sciences, Budapest, Hungary,
Email: ferto@econ.core.hu.

** Corvinus University, Budapest, Hungary, Email: csaba.forgacs@uni-corvinus.hu.

*** Agricultural Research Institute, Budapest, Hungary, Email: juhasza@akii.hu.

**** Agricultural Research Institute Budapest, Hungary, Email: kurthyg@akii.hu.

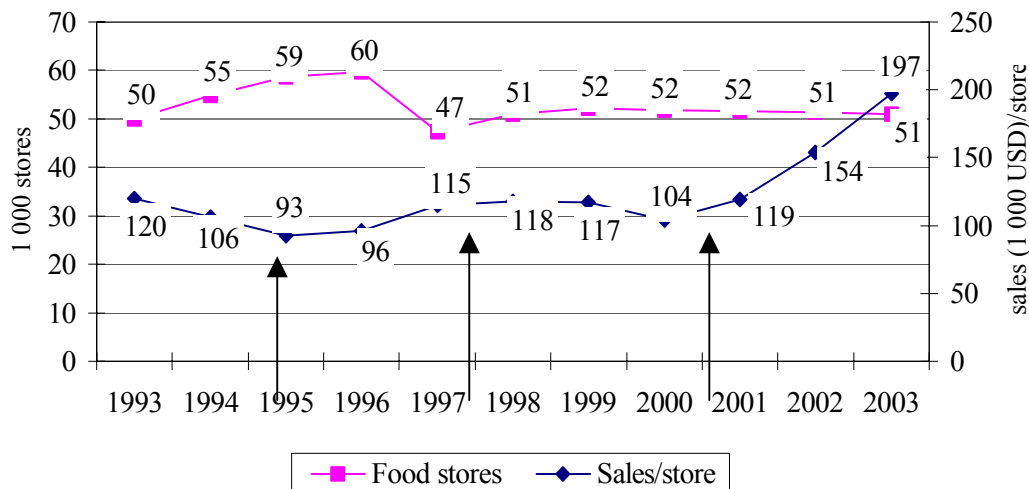
the small agricultural producers and food manufacturing companies. The share of super- and hypermarkets in food retailing has become crucial and ever-expanding. We focus on the activities and expansion of supermarkets, which has influenced the business relationship with the upstream agents and adjustment opportunities of small producers in the milk chain. The paper is organized as follows. First, we outline the composition and structure of the milk chain. Second, we analyze the changes in demand and supply. Third, the links with upstream agents are examined. Policy issues are discussed in Section 5. The final Section contains a summary and some conclusions.

2 COMPOSITION AND STRUCTURE OF THE SUPPLY CHAIN

2.1 Composition of the food retail sector

The political and economic transition at the beginning of the 1990s and the privatisation and emergence of multinational firms had significant effects on Hungarian food trading. A few Hungarian-owned supermarket chains were also created, some of them developing quite quickly. Nowadays, Hungarian trading businesses are dominated by small- and medium-size enterprises. Four periods can be distinguished. First is the period of spontaneous privatisation (1989-1990) when smaller shops were privatised and a large number of private shops were also established. Second is the period between 1991-96 when owners of larger food retail chains changed. Most of the shops in favourable areas have become the property of multinational chains, while some of the small private shops went into bankruptcy. The first part of this period is characterised by the launch of so-called "forced"² enterprises, many of them only remaining in business for a short time. In the next period (1996-1997), concentration started to grow. However, in the first few years of the concentration period, until 2000, the number of shops and even the number of stores operated by sole proprietors increased. The number of food retail stores in the "break" of 1997 was due to the new system of recording the number of shops, not only of those that were newly-opened, but closed as well (SÜVEGES, 2001). More than 50,000 food stores and mixed retail businesses were operating at the end of 2003 (Figure 1) indicating a decrease, following 2000, due to the rapid growth and diffusion of large food chains and strengthening competition (AGÁRDI and BAUER, 2000).

² After the change of political system, unemployment increased drastically, thus thousands of people started their own small businesses, mostly employing only themselves or other members of the family.

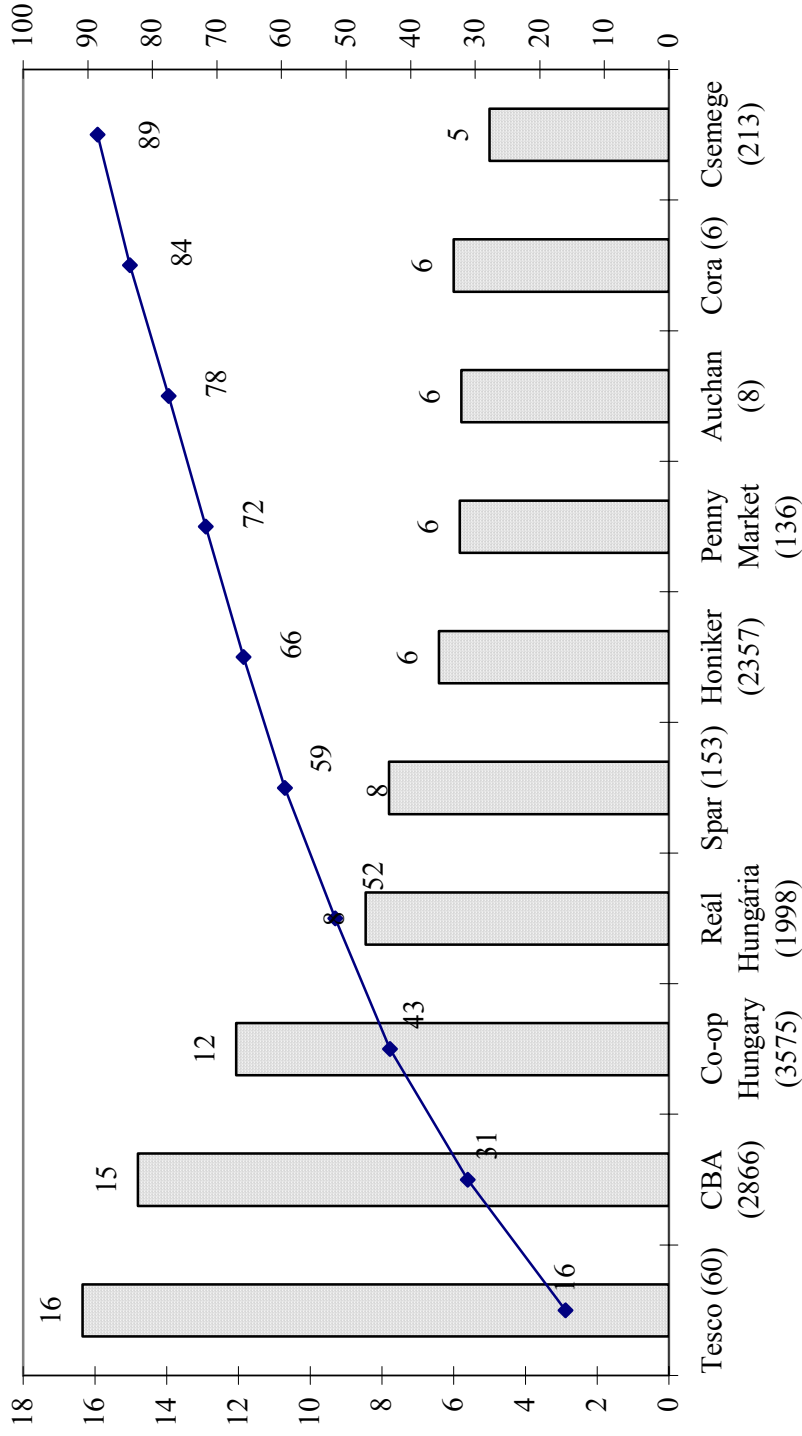
Figure 1: The number of retail food stores and sales per store

Source: Own calculation from yearbooks and monthly bulletins of the CENTRAL STATISTICAL OFFICE (CSO), 1998-2004.

Retail sales almost doubled in the given period, while only a mild increase could be detected in the number of stores, reflecting the process of concentration. The share of the largest ten food retailers of total sales increased dramatically, from 52 % to 89 % (Figure 2). Despite the high concentration level, the number of retail shops remained surprisingly high compared to other countries.

In 2003, there were four so-called procurement associations (Co-op Hungary, CBA, Honiker, Reál) among the top 10 retailers. The presence and development of buyer associations are the main reasons for the much slower decrease in the number of stores. These small shop networks are characterized by quite high penetration (69.6 %) and frequency of shopping (35.3 %) but consumer spending per shopping visit is quite low (1,000 HUF). The over-represented groups are the low income, small settlement and downtown consumers, where the retail sector showed impressive growth during recent years. Besides the small stores, other important store formats are supermarkets and discount stores (mostly 201-400m² and 401-2,500m²). In 1997, seven of the top 10 retailers belonged to this category: Three were Hungarian and four foreign-owned. Since then, the structure of retailing has changed considerably, and in 2003 only three of the top 10 companies: Spar (Spar-, Kaiser- supermarkets, and 16 Interspar hypermarkets) Penny Market (discount stores) and Csemege (Professional discount stores, Match, Smatch supermarkets) operated under the supermarket and discount store format.

Figure 2: Top 10 food companies, share of FMCG retail sales³ 2003



Source: Own calculation from yearbooks and monthly bulletins of the CENTRAL STATISTICAL OFFICE (CSO), 1998-2004 and the issues of Mai Piac (1998 and 2003).

³ C+C companies such as Metro are registered as wholesalers and are thus not part of the retail statistics of the CSO.

Hypermarkets have an ever-increasing role in the Hungarian retail sector (2,500 nm²). From the top 10 retailers in 1997, not one company operated a hypermarket, but in 2003 there were four companies which did: Tesco (33), Spar (16) Auchan (8) and Cora (6). These hypermarkets now account for 24 % of total food sales. An increasing share of the food business is concentrated in large stores, (hypermarkets and shopping centres) reaching approximately 18 % in 2001 (CSO).

2.2. Chain of the dairy sector

During the pre-reform period, producer and investment subsidies were used in order to generate incentives for milk production, while demand was also stimulated by consumer subsidies. The government intervened during times of shortage by setting new prices and providing extra subsidies to increase production. In this period, the state (21.1 %) and collective farms (55.5 %) dominated milk production in 1989, respectively, compared to 23.4 % by private farms. The average herd sizes of the three main farm types were: State farms (1,300 cows), collective farms (300 cows) and small holders (1.4 cows).

The structure of dairy production has changed considerably during the last 14 years. The number of private dairy farms dramatically decreased between 1996 and 2003, by 45 %, while the 12 % decline was more modest for agricultural enterprises. Surprisingly, in agricultural enterprises the average herd size decreased from 326 to 298, whilst it grew from 2.9 to 4.4 in private farms. In 2003, agricultural enterprises accounted for 69 % of output in terms of herd number, whilst the share of private farms was 31 %. The declining tendency of milk cows was not followed by reduced milk production because of increasing yields.

The number of farms with milk production is also falling every year. Nowadays, around 700-800 agricultural enterprises and 20-25,000 private farmers keep cows. Compared to the former EU-15 countries, yields are still 5-20 % lower; but they are higher, by the same percentage, than other New Member State countries. The concentration tendencies in Hungary are in line with the production trends of leading European countries: Decreasing cow numbers, but increasing yields are providing the stable milk production level.

During the analysed period in Hungary, 85-95 % (in 2004, 98 %) of the purchased milk was "extra quality", which is the only category for human consumption according to EU regulations. Differences between the small and large scale farms appear during the cooling, storing and transporting stages.

The dairy farm structure is different in agricultural enterprises and private farms. 95 % of private farms have less than 10 cows, while 74 % of agricultural enterprises have more than 100 cows. The share of farms below 10 cows in the herd stock is 71 % for private farms and 0.1 % for agricultural enterprises. The

emerging share of medium-sized dairy farms is only 13 %. In short, the polarised structure of Hungarian dairy farms did not change considerably during the analysed period.

In Hungary, the structure of milk production can be divided into three main groups differing in concentration, technology, and in some respects, in market segmentation as well:

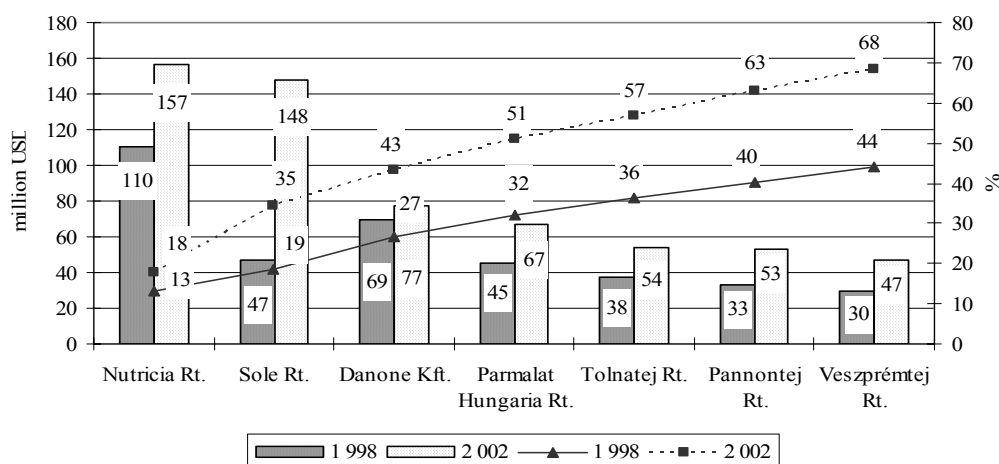
- Agricultural enterprises and a minority (3-7 %) of the private farmers mostly keep more than 100 milk cows (300-600 on average) for production and sale to processors.
- Around 17-20 % of the private farmers have between 10 and 30 cows and try to produce for processors.
- And finally, most of the private farmers (71 %) have less than 10 cows.

The agricultural enterprises of the first category may be viable in the future. But the future viability of the second group of farmers, those with 10-30 cows, is questionable. They are too large for direct sales, and at the present procurement prices, too small to be profitable with processors as their main market. The third group most probably will lose the processors – at least the large ones – as a market, as direct consumer sales become more and more viable.

2.3. Concentration in processing

Concentration in the milk processing sector started in the mid-1990s. The number of processors is still around 80, although the top 10 companies accounted for almost 80 % of net sales, while the top 5 accounted for 57 % (Figure 3).

Figure 3: Concentration in the dairy industry (Net sales in 1998 and 2002)



Source: Own calculation from AKII data.

Those processors which are not able to comply with EU hygiene standards or are unable to accommodate growing competition will go out of business, while

the importance of the large (even multinational) companies will continue to grow since they are only interested in the middle- and small-size processor markets. Two years (1998 and 2002) were chosen to show the links and relations with upstream agents in the vertical links, and were divided into three stages: Production, wholesale and retail/consumer. The vertical chart for 2002 can be seen in Annex 1.

Production phase: The production of milk slightly grew from 1998 to 2002, mainly because of the increasing milk yield. In the vertical flow of milk, the role of processors is traditionally much more important. Raw milk consumption provides only around 5-10 % of the production. Sales to processors did not change significantly from 1998 to 2002. Consumption from own production was very low and even showed a declining trend due to the decreasing number of small holders (with 1 or 2 cows). A stagnating 4 % of production goes to other sales.

Wholesale phase: Exports increased in the examined period. Hungary has always produced more milk than it has consumed, and compared to the domestic production base, import has a stable 7 % share. Concerning market channels, the processors' sale to the retail sector is by far the most important (app. 60 %).

Retail level: Based on estimations, the share of HORECA in milk product consumption increased to 12 %. An important trend is the decline of milk consumption from own production, to 1 %, and direct sales to consumers to 4 % between 1998 and 2002.

Hypermarkets are the absolute winners of recent years, having become the second most favoured retail source of dairy products.

Concerning the price structure of the vertical chain, the share of industry price in retail price slightly increased, at the expense of farm price, between 1994 and 2002. The proportion of farm price in retail price has decreased from 55 % to 46 %.

3 SUPPLY AND DEMAND IN THE VERTICAL CHAIN

3.1. Demand

The standard of living, which fell until the mid-1990s, has since shown moderate growth. Inequality grew in the first years of political and economic transformation. In the second half of the 90s, inequality indices no longer showed growth, but there was considerable internal restructuring during this period (TÓTH, 2003). The poor have less of a chance to improve their position, and the economic growth failed to increase their mobility (MOLNÁR and KAPITÁNY, 2002). Due to the abolition of consumer support, increasing consumer prices, falling real income, newly introduced taxes and infrastructure development, based on households' investments the share of food of total household expenditures increased

in the first half of the last decade, and then decreased slightly. In 2002 it amounted to 29.6 %.

Investigating the structure of food consumption by socio-economic strata, the following important trends can be found (RÉDEY et al., 2002). The differences between two polar layers (first and tenth deciles) have increased both in terms of quantities and volume of expenditures.

The relatively poorest households basically consist of those where children live with inactive earners. Their food expenditures have reached 70 % of the households with highest income in 2001, but the share of expenditure in total households' expenditures was above 40 %.

A recent study shows that consumer habits differ by socio-economic strata (VÁGI, 2001). Older people and households with more children usually buy foods in traditional shops, while young, singles and couples prefer supermarkets and shopping malls.

Consumption out of home stagnated in the 1990s, while an increasing tendency started in 1999; then, consumption grew by more than 50 % until 2002, but still accounted for only 8 % of the whole food consumption in 2002, (11 % in 2003) still below that of developed countries.

The share of food consumption from own production decreased by almost 20 % during the analysed period. The share of own production from consumption decreased, from 23 % to 16 %.

3.2. Supply

During the pre-reform period, Hungary's agriculture was dominated by large farms. Some half of GAO was produced by cooperatives, one-third of production came from small-scale farming (mainly household production of deeply integrated coop members) and less than one-fifth of output was produced by state farms.

Agricultural reform consisted of price liberalisation, cutting agricultural subsidies, trade liberalisation, privatisation and land reforms (FERTŐ, 1999). Between 1989 and 1993, focus was given to building up the legal and institutional framework of the market economy. The reform steps from 1994 to 2004 dealt with the consolidation and recovery of agricultural reform concentrating on stabilizing the domestic agricultural markets.

GDP decreased in the beginning of the 1990s for both industry and agriculture. After 1994, manufacturing continuously increased, and its growth rate exceeded the growth rate of total GDP. However much agriculture shows solid signs of recovery during this period, in 2002 its level still was below that of 1991.

Between 1991 and 2002, agriculture's share of total GDP fell from 7.8 % to 3.3 %, whilst its share of total employment fell by almost 50 %, from 11.9 % to 6.2 %. In the food industry, the share of GDP also fell by a quarter, from 4.6 %

to 3.3 %, whilst the share of total employment fell by more than one-sixth, from 5.1 % to 4.1.

The combined but differential effect of these declines has altered the sectors' relative labour productivity. In both sectors, labour productivity fell after 1995, as falls in GDP share outstripped falls in employment share. Labour productivity increased in the food industry after 1999, and in agriculture after 2000.

Foreign direct investments played a dominant role in the Hungarian food industry. At the end of 1995, foreign ownership already exceeded 50 % of the food industry. Although the number of foreign-owned companies decreased between 1995 and 2002, their role in owners' equity is more than 70 %, and their share in net sales exceeded 50 %.

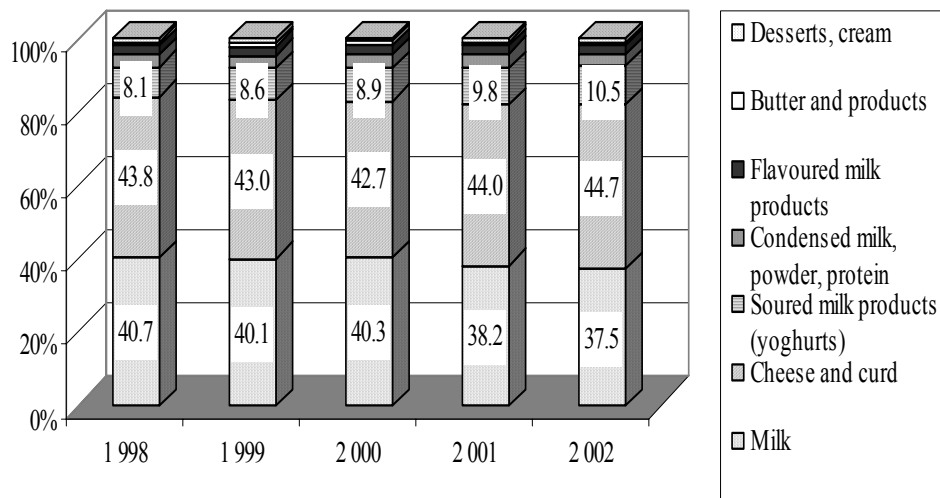
3.3. The influence of changes on the milk chain

According to the Food Balance dataset, the consumption of milk⁴ constantly decreased in the first half of the 1990s, then from 1995 to 2000 started to increase again, followed by a drop of 10.2 % in 2001. The yearly consumption per head was almost 8 litres less in 2002 than the average of 1996-2000. The Household Budget dataset shows similar tendencies though; the decrease starts as soon as 1998. The most important change was the 3 % growth of yoghurts and kefir consumption, from 9 to 12 %, within the whole dairy category. Figure 4 shows the same tendencies – decreasing milk consumption and the growth of soured (yoghurts, +30 %) and cheese and curd (+2 %) products in domestic sales. The decrease in milk consumption can be explained by the growing popularity of other drinks (beverages, mineral waters, fruit juices and "milk-like" products) and by increasing consumer prices. The share of food of whole expenditures decreased between 1993 and 2002, with a stagnating share until 1998. The difference of milk consumption between the highest and the lowest deciles is around 40 %.

Milk production fluctuations, around 2,000 million litres per year, reflect the response to changing economic and political conditions during the period in question. The efficiency of milk production has grown in natural terms. However, the FADN data shows that the profitability of milk production differs by farm types between 1999 and 2002. Private farms were more profitable than agricultural enterprises according to two income indicators. But standard gross margin is higher in agricultural enterprises than private farms.

⁴ Milk and milk products together in raw material, thus the change in the inner structure of milk consumption can significantly change the whole consumption trend. This is a problem because milk is a staple food, but cheese is much more price and income sensitive.

Figure 4: Domestic sales structure of the dairy products (in raw milk equivalent)



Source: MILK PRODUCE COUNCIL, 2003.

Gross production in the dairy industry continuously increased, at current prices, between 1996 and 2002. Gross income in the dairy industry reports an aggregate loss in 1998 and 1999, after it realised an increasing profit.

The role of FDI is predominant in the Hungarian dairy industry – its share in owners' equity exceeds 90 %. The share of FDI in the dairy industry is higher than in the food industry as a whole, and foreign ownership in the dairy industry is concentrated in larger enterprises, with increasing market share. The new foreign owners have had a dramatic effect on the milk chain in the following areas: Internal restructuring of production and marketing, procurement and quality control, performance and likely trends after accession to the European Union (GORTON and GUBA, 2001).

4 THE LINK WITH UPSTREAM AGENTS

4.1. Cooperation with milk producers

The share of small producers is 10 % of total production. These producers mainly keep old Hungarian red-spot cows. The average yield of small producers is about 4,500 litres/cow, well behind that of large cooperatives and corporate farms. The smaller farms have no cooling systems, and surplus is mostly marketed through a milk collection agency located in the village. Local collectors sign a contract with small producers which covers quality and quantity issues on a monthly basis. In future, local milk collectors must consider the procurement prices of processors, and will only be able to realize a small margin, otherwise they will not be able to buy or sell the milk.

Reforming market coordination: The board of Milk Produce Council (MPC) has decided to reform its function as a result of EU membership. Everybody among the members have an empty sheet, and practically, anybody can leave the MPC if they want. However, leaving the MPC brings disadvantages for the producers: E.g. more difficult access to markets, worse bargaining position for price negotiations with processors, loss of information on market developments, increasing costs of finding new market niches.

Supply of milk of a selected processor: The Processor has had contracts with farmers producing at least 50,000 litres of milk a year. Among the suppliers, one can find cooperatives, companies, limited holding companies and corporations. Milk is purchased only from those suppliers having a quota (buying milk from local collector agents may have risk elements connected with hygiene, quality, quantity delivered, efficiency of production, finding a new supplier). Payment is made mostly within a 30 day guideline. One processor company has maintained business links with 60-65 suppliers, providing the company with 80-90 million litres of milk annually.

4.2. Bargain position of a big processor

The interviewed processing company has attempted to set up stable, long-term business linkages with suppliers. They select the partners carefully, taking into account the following issues: Traditional business links, location, size of production of the supplier, quality, trust and professional background of the supplier. The processor expects suppliers to have HACCP. The cooperation with milk producers is based on an annual contract, and signing a basic contract for middle-term (3-5 years) is also possible. The annual contract includes quality, quantity based on quota, scheduling delivery, price bargained and fixed for one year, conditions of delivery and deadline for payment (30 days). The processing company pays special attention to quality requirements and has introduced ISO 9001, as well as HACCP. Putting TQM into practice is also underway. For marketing the products, the processing company has three groups of buyers: Hypermarkets (60 %), wholesalers (25 %) and retailers (15 %).

The larger processors, which relied on a sizeable number of small producers for raw milk, have rationalised the number of actors they deal with. Frequently, dairies ensure their supplies via long-term skeleton contracts with the larger milk producers, while prices and quantities to be supplied are fixed annually. More formal contractual arrangements have tended to emerge to ensure supplies and reduce transaction costs. In a number of cases, relationships with producers have become more entwined by extending credits, assets (e.g. cooling equipment) and the provision of technical advice and variable inputs. Contracting allows dairies to have greater control over the agricultural production process. The development of intensive contracts has aided the development of medium-sized individual farms. Due to a shortage of capital (poor access to credit, etc.) and

low profitability in the sector, only a few producers are able to expand their dairy farms to reach the "family farm" size, and these have overwhelmingly depended on credits and support from foreign-owned dairies.

Foreign-owned processors have also been instrumental in the drive to improve the quality of raw milk produced (GORTON and GUBA, 2001). Processors determine quality requirements and enforce them through the procurement system. Farmers are paid according to the quality of milk, with bonus payments for 'extra quality' milk, and penalties or the refusal to purchase milk below certain quality thresholds. These quality thresholds have had the effect of excluding small-scale (household) producers who cannot preserve the quality of milk due to the lack of adequate cooling facilities. The linkages between larger farms and processors have become stronger with more stringent quality requirements, complex payment terms, and in some cases the provision of credit, assets and inputs. These dairies are increasingly dealing with centralised retail buyers.

FDI has a significant effect on the structure of the dairy industry, and buyer relationships at the retail level. These investors have developed along Western European lines by introducing and developing warehouse point distribution, own brands and systems for electronic data interchange (EDI). EDI is used for determining the size and frequency of deliveries, as orders are based on actual buying patterns rather than estimates. In these regards, Hungarian supply channels increasingly mirror practices in Western Europe. Excluded agents (micro-producers and small-scale Hungarian dairy processors) are involved in much more *informal* channels of distribution, characterised by own consumption or sale to neighbours and small traders.

5 POLICIES IN PLACE TO SUPPORT THE INCLUSION OF SMALL AND MEDIUM AGRIFOOD ENTREPRENEURS

5.1. Private sector policies

Agriculture is traditionally a risky business, but in transition countries agricultural producers face additional difficulties. The absence of enforceable contracts for setting up any kind of vertical co-ordination has become extremely difficult. Therefore, searching for new partners for long run, relation-specific investments has been associated with high transaction costs for farmers. In addition, this creates severe barriers for price discovery involving high transaction costs to coordinate market exchanges. In those sub-sectors where any type of production contract does exist, agricultural producers face hold-up problems (e.g. delayed payment for delivered products, or ex post price reduction by retailers), which are stressed by GOW and SWINNEN (1998). These problems are very severe for that sub-sector, and dominate the fragmented and small-scale farm sector. There is

very little information on private sectors policies to support small and medium size farms, therefore marketing type co-operatives can solve some problems arising from missing and embryonic market institutions (SZABÓ and FERTŐ, 2004).

5.2. Public policies

Agricultural subsidies are provided through a system of minimum prices, budgetary support, and border measures. The Agricultural Market Regulation Act of 1993 directly regulates wheat markets (for human consumption), feed maize, milk, live cattle, and pigs for slaughter by providing market price support via minimum guaranteed prices, paid up to a production quota limit, and in the case of market instability, government purchases. Support for reducing farm input costs includes capital grants linked to interest rate concessions for covering production costs, reduction of the fuel tax and payments for irrigation development. Import tariffs and export subsidies are used for most important agricultural products. Export subsidies constitute an important, albeit declining, policy instrument to regulate crops and animal product markets. Imports are regulated by *ad valorem* tariffs and tariff rate quotas.

The milk sector is supported by several ways. First, there is an indicative price system, with the possibility of intervention. If producers do not find a buyer, they may, in theory, sell their quality milk to the State at a guaranteed price lower than the indicative price. In recent years, market prices were usually higher than the trigger price, therefore intervention has not been activated. Individually, dairy quotas were introduced in 1996. Second are budgetary payments based on output, which mainly include quality and intervention payments. Third are area and headage payments, which were HUF 20,000 (USD 77) per dairy cow in 2002. Fourth are payments based on input use, including a subsidised interest rate and guarantees for farm credit (around 45 % of total), capital grants (15 %) and fuel tax concessions (20 %). Market price support had a predominant role in subsidizing milk sectors. Payments based on input use and on output had an increasing role, but their share was below 25 % of total support.

The National Land Fund was amended and a new institutional system was established to reassess land policy. The main amendments entail giving anyone who is renting farmland priority over family farmers for the purchase or rent of arable land. The duration of land leases for National Land Fund lands will decline from 50 to 20 years, while in the case of private persons, this will increase from 10 to 20 years. Land sales to foreigners and legal entities are prohibited. Special attention and support is given to the creation and development of producer marketing organisations. Agricultural insurance is supported at a rate of 30 % of the fees charged. In the context of food safety, new labelling rules for dairy products, eggs, and most foods of vegetable origin entered into force as from April 2002.

According to the Copenhagen Agreement, Hungary uses the Single Area Payment Scheme (SAPS). Hungarian farmers in 2004 received 305.81 million EUR

in direct payments. Calculation of milk direct payments, due to the CNDP, is complicated. According to the CAP Reform, adaptation agreement in the milk sector CNDP is even higher than in the other sectors of agriculture, in total amounting to 60 %. The 85 % direct payment (25 % from the EU, 60 % from Hungary) with a 1,947,280-ton milk quota means 22.81 million EUR. From this amount, the subsidy paid, according to the SAPS, must be subtracted, which is 5.84 million EUR. When the 16.97 million EUR left over is divided by the quota, the result is 8.71 EUR in subsidy for a ton of milk.

6 CONCLUSIONS

During the transformation period, agriculture and food processing have been declining sectors. The share of individual farms is predominantly in milk production, with moderate concentration, while the dairy industry reflects a growing concentration and the predominant role of multinational firms. Particular groups of agricultural producers use different vertical co-ordination mechanisms to connect with the food industry. Agricultural enterprises and co-operatives usually have a production contract, sometimes long-term, with the food industry. Where any type of production contracts does exist, agricultural producers face hold-up problems which raise the cost of market exchange and lead to strong barriers for the establishment of new market institutions. FDI in food industries encourages the solution of hold-up problems, mainly via long-term contracts, in the milk chain. However, where multinational firms have dominant market positions, they also may create a new type of hold-up problem: Only a minor share of agricultural producers has stable linkages with the food industry. Furthermore, a majority of farmers face significant market uncertainties without reasonable risk-sharing techniques.

On the demand side, producers should face rather stagnant or slightly increasing domestic demand. But market segmentation may help them exploit possibilities arising from niche markets. The increasing role of the modern retail sector requires more collective action by producers and processors to countervail the market power of modern retailers. Farmers' problems cannot be solved simply by providing government support. Without establishing and developing efficient and transparent market institutions, sustainable growth in the agri-food sectors cannot be predicted.

Public policies should focus on reducing transaction costs by financing investments in rural infrastructure, encouraging investment in post-harvest activities (storage, manipulations, and packages) and founding or improving intermediary organisations to reduce the exchange costs between farmers and their partners. Due to bad experiences during the transition period, trust does not exist between economic agents. The key factor of future successful supply chain management

is developing reliable contractual forms based on trust between partners and establishing the right conditions for enforcing contracts and thus avoiding hold-up problems.

REFERENCES

- FERTŐ, I. (1999): Restructuring of Hungarian agri-food sector, *Acta Oeconomica*, 50, (1-2), pp. 151-168.
- FERTŐ, I., SZABÓ, G. G. (2004): Transaction cost economics and agricultural co-operatives: A Hungarian case study, in: BREMMERS, H. J., OMTA, S. W. F., TRINEKES, J. H., WUBBEN, E. F. M. (eds.): Dynamics in Chain and Networks, *Wageningen Academic Publishers*, Wageningen, pp. 245-251.
- GORTON, M., GUBA, F. (2001): Foreign direct investments and restructuring of the Hungarian dairy processing sector, *Journal of East-West Business*, 7, (4), pp. 5-28.
- GUBA, F. (2001): Transzferek és hatékonyságzavarok az élelmiszer-termékpályákon, *Közgazdasági Szemle*, 48 (1), pp. 44-62.
- JANSIK, CS. (2002): Determinants and influence of foreign direct investments in the Hungarian food industry in a Central and Eastern European context, MTT Agrifood Research Finland, *Economic Research Publication*, Helsinki, p. 102.
- JANSIK, CS. (2004): Food industry FDI – An integrative force between Western and Eastern European agri-food sectors, *Eurochoices*, 3 (1), pp. 12-16.
- ORBÁNNÉ, N. M. (2004): Food consumption and the convergence of consumer prices between Hungary and the EU, *Studies in Agricultural Economics*, No. 100, pp. 71-90.
- KAPITÁNY, ZS., MOLNÁR, GY. (2002): Inequality and mobility analysis by the Hungarian rotation panel, INSTITUTE OF ECONOMICS, HUNGARIAN ACADEMY OF SCIENCES (eds.): *Discussion Paper 4*, Budapest.
- KARTALI, J. (2004) (ed.): A főbb agrártermékek piacra jutásának feltételei az EU csatlakozás küszöbén, RESEARCH AND INFORMATICS INSTITUTE FOR AGRICULTURAL ECONOMICS(ed.): *Agrárgazdasági Tanulmányok 2004, 2*, Budapest.
- LAKNER, Z., HAJDU, I. (2002): The competitiveness of Hungarian food industry – A system based approach, *Mezőgazda Kiadó*, Budapest.
- LEHOTA, J. (2004). Termékszintű versenyképességi vizsgálatok, A tejszektor piacelemzése, SZIE Gazdaság- és Társadalomtudományi Kar, Gödöllő, Manuscript.
- RÉDEY, M., MIKESNÉ, M. B., SZOUKUP, I. (2002): Food consumption according to the household budget survey data, Hungarian Central Statistical Office, Budapest.
- SZABÓ, M., TÓTH, J. (1998): Agricultural market development and government policy in Hungary. The case of the milk sector, Budapest University of Economic Sciences and Public Administration, Manuscript, pp. 59.
- SZABÓ, M. (1999): Vertical coordination and integration in the milk sector in Hungary and the EU, RESEARCH AND INFORMATICS INSTITUTE FOR AGRICULTURAL ECONOMICS(ed.): *Agrárgazdasági Tanulmányok 1999, 9*, Budapest.

SZABÓ, M. (2000): Foreign owned companies in the Hungarian food industry and their impacts on the EU accession, RESEARCH AND INFORMATICS INSTITUTE FOR AGRICULTURAL ECONOMICS(ed.): *Agrárgazdasági Tanulmányok 2000, 12*, Budapest.

TÓTH, I. GY. (2003). Jövedelemegyenlőtlenségek – Tényleg növekszenek, vagy csak úgy látjuk, *Közgazdasági Szemle, 50 (3)*, pp. 209-234.

VÁGI, P. (2001): Consumer groups and habits in Hungary, Hungarian Central Statistical Office, Budapest.

Statistical Sources:

HUNGARIAN CENTRAL STATISTICAL OFFICE: Agricultural Statistics Yearbook, various issues.

HUNGARIAN CENTRAL STATISTICAL OFFICE (2001): Livestock 2000, Budapest.

HUNGARIAN CENTRAL STATISTICAL OFFICE (2004): Livestock 2003, Budapest.

HUNGARIAN CENTRAL STATISTICAL OFFICE (2004): Foreign direct investment in Hungary 1995-2002, CD.

Interviews (2004):

ACCOR PANNONIA HOTELS, Budapest.

Flammker Kft.

Foodexpressz.

MÉTIBER, Kft (Wholesaler of milk and milk products).

Milk Produce Council.

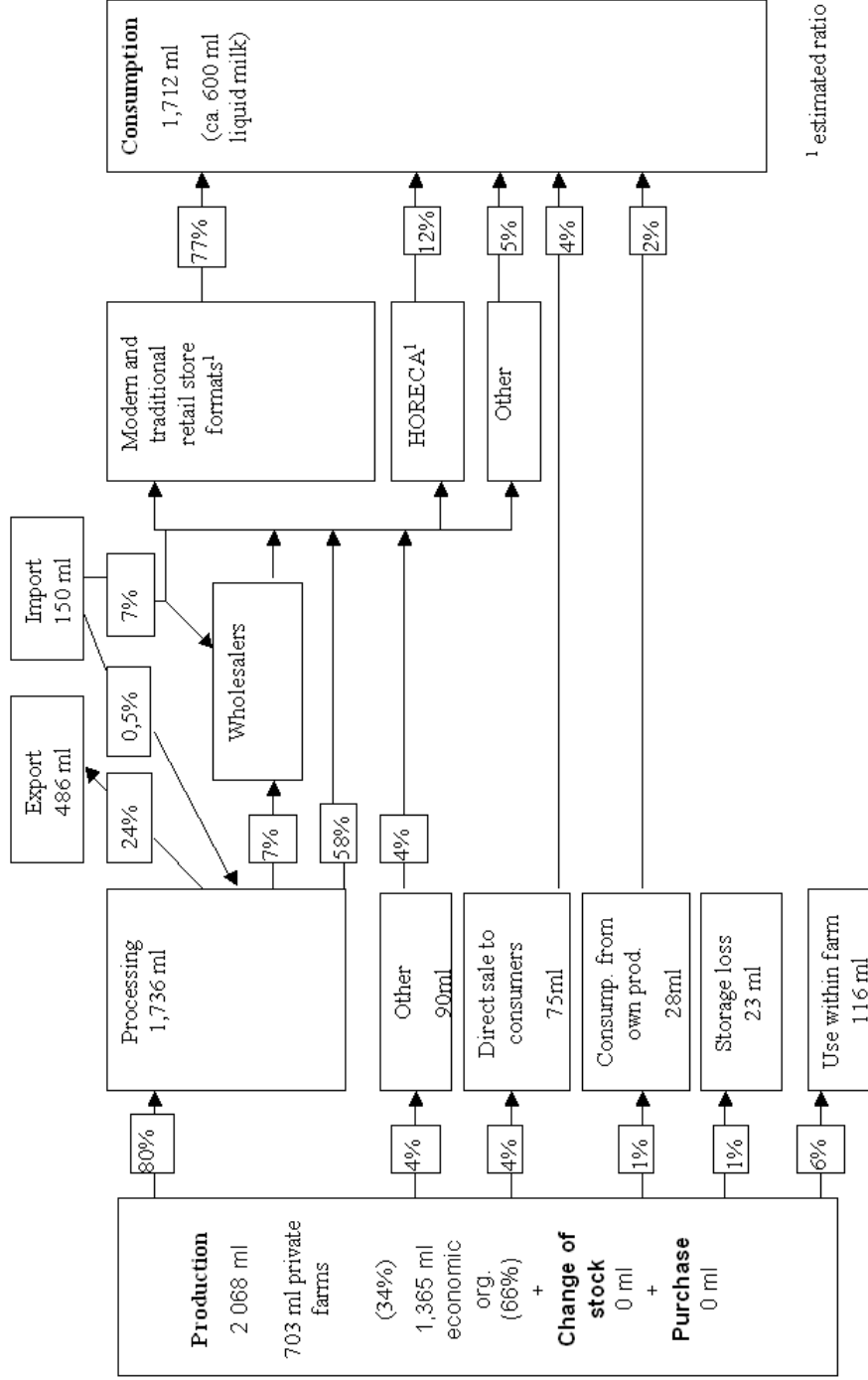
Veszprem Tej (Milk processor).

Annex 1: Vertical flow of dairy products in Hungary, 2002

Production level: 100%= 2,068ml

Wholesale level: 100%= 2 051ml

Retail level: 100%=1,712 ml



¹ estimated ratio

ANALYSIS OF COMPETITIVENESS, ECONOMIC EFFICIENCY AND DISTORTIONS IN THE ESTONIAN MILK SECTOR

*PIRET HEIN**

ABSTRACT

The paper analyses the competitiveness of the Estonian milk sector and the implications of implementing the EU's Common Agricultural Policy (CAP). In addition to milk farms, the study also considers processors, whose performance is important for analysing the impact of the CAP since their market price support measures are provided at the processed products level. The results indicate that competitiveness differs year-to-year for farms as well as for processors. At the farm level, differences in performance also occurred between farm types; in the processing sector, the choice of strategy appeared to be important. EU accession brings relief to the milk farms in the short term, but for processors, the outlook is less favourable. The analysis also showed that some of the divergences that occurred at the processor level were reversed at the farm level, which indicates that the performance of the processors is important for the farm sector's competitiveness.

Keywords: *Milk sector, competitiveness, policy analysis matrix, Estonia.*

1 INTRODUCTION

Since the beginning of transition, Estonia has, unlike most of the other transition countries, pursued a liberal agricultural policy. But EU accession changed market conditions as well as policies for the Estonian milk sector. What consequences these developments have on the milk sector's competitiveness will be the focus of this paper.

* Humboldt University of Berlin, Faculty for Agriculture and Horticulture, Institute for Agricultural Economics and Social Sciences, Chair for Agricultural Policy, Luisenstr. 56, 10099 Berlin, Germany, Email: piret.hein@agrار.hu-berlin.de.

Since the beginning of economic transition, extensive literature has emerged which analyses the competitiveness of transition countries' agriculture and its prospects in light of EU accession. Much less attention has been given to the role of the downstream sector and just a few studies have considered the full agro-food chain in transition economies (e.g. KRAY, 2002; GUBA, 2000; KUHAR and ERJAVEC, 2005). Furthermore, only a few studies have concentrated specifically on the competitiveness of milk production in Estonia (see, for example, HOLZNER, 2004; and BRANDT, 1998).

In most cases, research has found that EU accession will increase the profitability of agriculture as the prices and support levels are anticipated to increase in Central and Eastern European Countries (CEEC). Opinions about the future of the processing industry are different. As pointed out by TANGERMANN and SWINNEN (2000) the food industry in candidate countries would need to lower their margins and gain efficiency in order to stand the pressure of increasing competition from EU accession.

The current study involves both milk producers and milk processors in order to analyse market developments, as well as changing policies due to accession, on the competitiveness in the value added chain. This approach is particularly helpful because the CAP's common organisation of the milk market also acts at the level of processed products. The following questions will be discussed in the paper: How competitive and efficient is the milk sector and what is the impact of EU accession? Are there distortions in the agro-food chain and do they influence the expected profitability after implementing the CAP?

Competitiveness will be discussed at the sector level, focusing on cost competitiveness. For that purpose, forward-looking measures of potential competitiveness are considered to be appropriate and the Policy Analysis Matrix (PAM) is chosen to serve as a methodological basis of the study.

The paper is structured as follows. The second section discusses the concept of PAM and reviews literature both on its merits and limits. The third part presents the characteristics of the Estonian milk production and processing sector, as well as discusses the data, social valuation and model specification for the Estonian milk sector. Results are presented in the fourth section, and are followed by the paper's conclusions.

2 CONCEPT OF POLICY ANALYSIS MATRIX AND ITS APPLICATION TO ESTONIAN MILK SECTOR

The economic literature does not provide a single definition of competitiveness¹. It is a relative concept and can be applied to different levels within an economy or

¹ For a discussion and overview of definitions, approaches and measures of competitiveness, see, for example FROHBERG and HARTMANN (1997); SIGGEL (2003).

used to compare different countries. In the current study, competitiveness is defined and measured through profits at the sector level. PAM, originally designed by MONKE and PEARSON in 1989, was selected as the suitable method for the analysis.

PAM has been extensively used in the analysis of agricultural policy in transition economies (e.g. BOJNEC, 1999; KAVCIC et al., 2001; KRAY, 2002) as well as in developing countries (e.g. BOGALE et al., 2002). Although MONKE and PEARSON (1989) suggest the calculations of PAM for the whole commodity chain, including producers, processors and the marketing sector, most studies limit themselves to the analysis of agricultural production. Only a few studies have also considered downstream sectors (e.g. STAHL and SHAPIRO, 1994; and KRAY, 2002). There are also studies that have concentrated only on the processing level (e.g. GUBA, 2000; KÖTSCHAU et al., 2003).

PAM allows for the quantitative measurement of competitiveness at the farm level as well as at the processor level. Transfers among the key interest groups – producers, consumers and policy makers controlling the allocations from the government budget, can be identified with the help of PAM (MONKE and PEARSON, 1989).

Table 1 presents the structure of PAM. The idea is to construct two accounting identities for the activities under consideration, which consist of revenues, tradable costs, domestic factor costs and profits. The first identity (A, B, C, D) is measured under actual market conditions; the second one (E, F, G, H) in the "ideal world" conditions – in a hypothetical situation where no policy distortions or market failures exist. The former indicates the competitiveness of the activity; the latter determines economic efficiency or comparative advantage and is measured through the so-called economic prices². Comparison of these two results enables the determination of distortions arising from policy impacts or market distortions. These can be seen from the third row of PAM (I, J, K, L).

A number of ratios can be calculated within the PAM framework that allow for comparison between different farm types or commodity systems. These are of three types: Competitiveness indicators, comparative advantage indicators and policy impact indicators.

Interpreting PAM is relatively straightforward. The activity is competitive if private profits D are positive or when Private Cost Ratio (PCR) = $C / (A - B)$ is less than 1. This occurs when private factor costs are less than the value added³ (A - B) in private prices.

² Economic or social prices (also efficiency prices) reflect a situation where there are no policy effects and market distortions. For tradable goods, these are equivalent to world market prices; for domestic production factors with opportunity costs.

³ There are a number of possible definitions of value added. In the current analysis, value added is defined by the sophisticated CORDEN method, where value added is the sum of the returns on domestic factors (land, labour, capital) and the amount of domestic factors embodied in non-traded intermediary inputs (TSAKOK, 1990).

Table 1: Structure of the Policy Analysis Matrix

| | Revenues | Costs | | Profits |
|--|----------|-----------------|----------------------------|---------|
| | | Tradable Inputs | Domestic Factors | |
| Valuation in Private Prices | A | B | C | D |
| Valuation in Social Prices | E | F | G | H |
| Transfers (divergences) | I | J | K | L |
| Policy transfers | I_p | J_p | K_p | L_p |
| Market transfers | I_m | J_m | K_m | L_m |
| Private cost ratio (PCR): | | | $C/(A-B)$ | |
| Domestic resource cost ratio (DRC): | | | $G/(E-F)$ | |
| Nominal protection coefficient on tradable outputs (NPCO): | | | A/E | |
| Nominal protection coefficient on tradable inputs (NPCI): | | | B/F | |
| Effective protection coefficient (EPC): | | | $(A-B)/(E-F)$ | |
| Profitability coefficient (PC): | | | $(A-B-C)/(E-F-G)$ or D/H | |
| Subsidy ratio to producers (SRP): | | | L/E or $(D-H)/E$ | |
| D = A-B-C (private profits); H = E-F-G (social profits); I = I_p+I_m (output transfers); J = J_p+J_m (input transfers); K = K_p+K_m (factor transfers); L = L_p+L_m (net transfers) | | | | |

Source: Adapted from MONKE and PEARSON, 1989; KRAY, 2002; MORRISON and BALCOMBE, 2000.

The Domestic Resource Cost ratio ($DRC = G / (E - F)$) is the most widely used ratio that can be derived from PAM, and illustrates whether the activity has a comparative advantage. The ratio compares opportunity costs⁴ to the value-added it generates in economic prices. A value of less than 1 indicates the comparative advantage of the activity, or that the activity makes efficient use of domestic resources and is internationally competitive (BOJNEC, 1999). Instead of ‘comparative advantage’, the term ‘economic efficiency’ can also be used, as the measure indicates whether the activity makes efficient use of resources at the national level.

The Nominal Protection Coefficient on tradable outputs ($NPCO = A / E$) shows transfers on outputs, while the Nominal Protection Coefficient on tradable inputs ($NPCI = B/F$) indicates input transfers. Values other than 1 indicate implicit protection or the taxation of producers. The Effective Protection Coefficient combines, in addition to prices, costs into the ratio ($EPC = (A - B) / (E - F)$) and indicates the implicit protection or taxation of an activity when the ratio is not 1. The Subsidy Ratio of Producers ($SRP = L / E$) shows the share of net policy transfers in the total revenues valued at the social prices. This indicator is similar to PSE (Producer Support Estimate) calculated by the OECD, which measures the annual

⁴ Opportunity costs of the non-tradable commodities that will be determined during the PAM analyses are the second best equilibrium values and relevant only under the current set of policy constraints. If policies were to change, so would the opportunity costs. Therefore, PAM is not satisfactory in terms of economic theory: It is based on partial equilibrium, rather than a general equilibrium approach. Although, as argued by some authors, PAM does include some elements of general equilibrium, as it incorporates interdependences between the products market under consideration and factor markets (NGUYEN and HEIDHUES, 2004).

monetary value of gross transfers to producers from taxpayers and consumers (MELYUKHINA, 2003).

However, for interpreting the results, some limitations of the model should be kept in mind. PAM is a partial equilibrium framework and assumes perfect competition. It is static by nature, implying that it is only possible to analyse competitiveness for a certain point in time. The model is based on the Leontief-fixed input-output coefficients and does not account for producers' reactions to changes in domestic prices (MONKE and PEARSON, 1989).

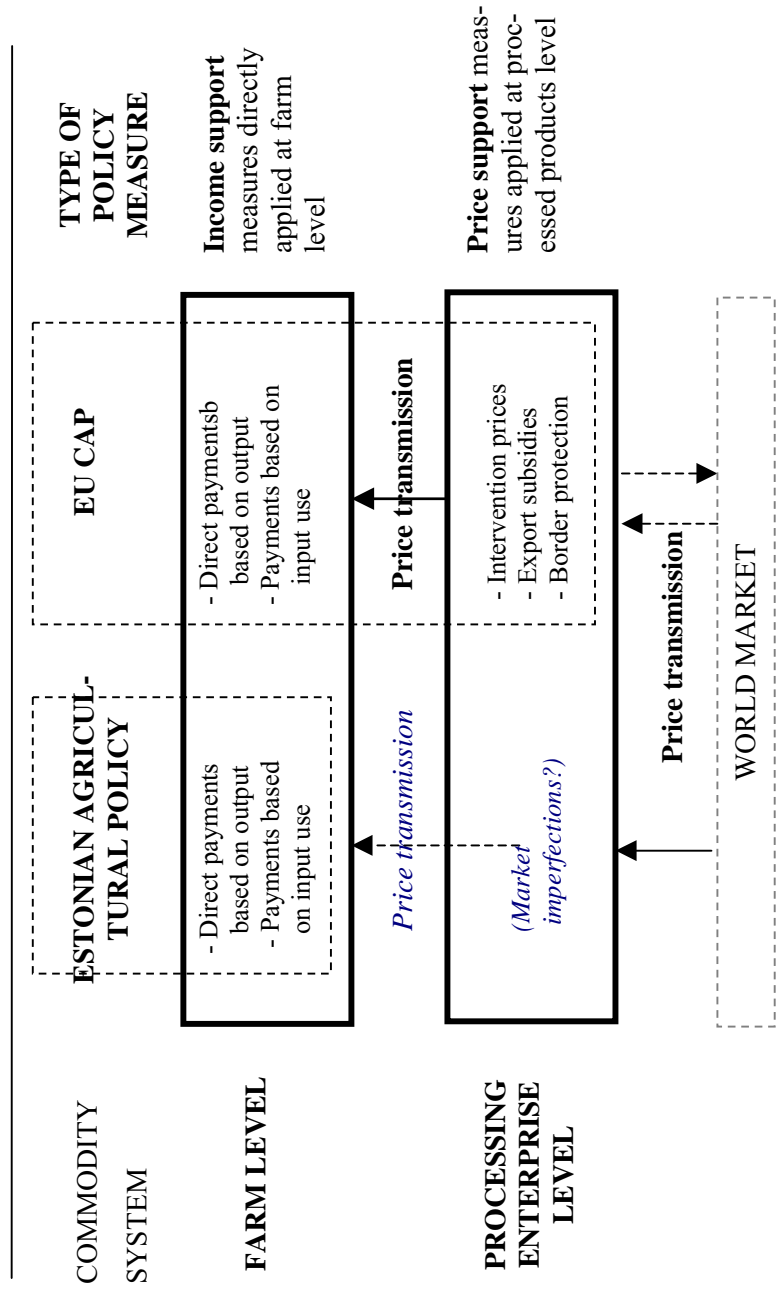
As the literature on PAM has increased during the last decade, it turns out that some of these limitations can still be overcome. Several extensions to PAM have been developed: For example, including environmental externalities (YAO, 1999) or developing a dynamic comparative advantage (GUBA, 2000). In the current study, an extension of the traditional PAM approach proposed by MORRISON and BALCOMBE (2002) is used to separate distortions, calculated in the third row of PAM, to market distortions and policy effects.

The average nature of the PCR and other PAM indicators are also limitations and have been subject to criticism. Although average figures do indicate whether the activity is competitive or not, it does not necessarily mean that all enterprises in the industry are competitive. There are always differences in technologies and efficiency among enterprises (GUBA, 2000, p. 42). To remedy this problem and improve the interpretation of PAM results, in this study the indicators are also calculated for individual farms and processors and presented as distributions that, when compared year-to-year, also provide a dynamic dimension to the analysis.

The structure of the analysis and the relationships between the parts of the supply chain under analysis for the Estonian milk sector are sketched in Figure 1. The figure also shows the differences between Estonia's pre-accession agricultural policy and the EU's CAP. In Estonia, policy measures were only applied at the farm level (direct payments and payments based on input use); no effective price support policies were applied at the processing level⁵. However, the common market organisation of milk in the EU includes policies at both the agricultural production and processed products levels. At the production level, similar types of income support measures are applied in the EU and Estonia. At the processing level, price support measures like intervention and export subsidies are applied in the EU, whose purpose is to stabilize markets (WILLIAMS, 1997, p. 23).

⁵ Although customs tariffs on agricultural products were introduced in 2000, they only applied to third-party countries and their effect was only redirection of some trade but no real effect on prices. Third-party countries were countries with which Estonia did not have a free trade agreement. Trade agreements were concluded with 13 countries that were also main trading partners (EU, Latvia, Lithuania, Ukraine, EFTA and CEEC countries (except Romania) Faeroe Islands and Turkey).

Figure 1: Structure of the analysis: Relationships in the agro-food chain and applied policies

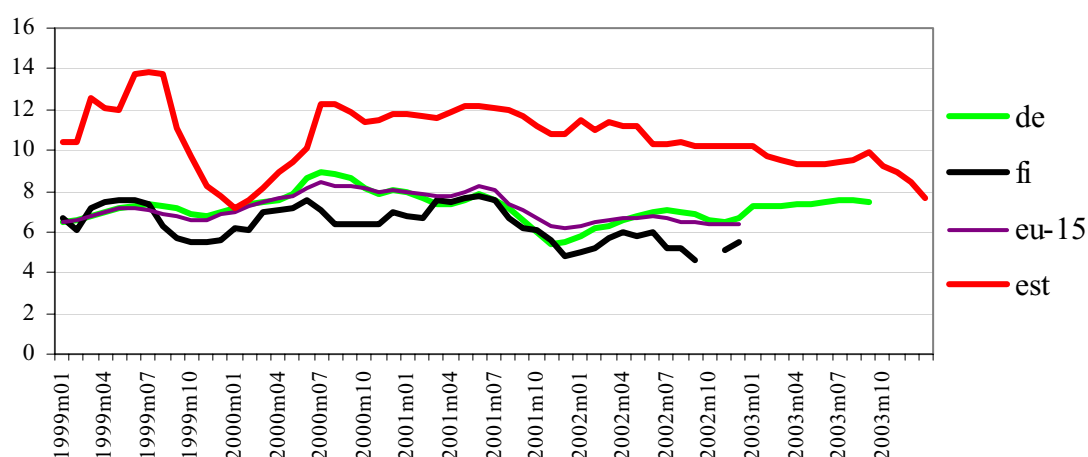


Source: Own figure.

In the EU, price support is transferred to the farm level since the markets are developed and well functioning. In the case of a transition country like Estonia, markets are still immature. Existing market imperfections may therefore hinder full transmission. As an example of possible market imperfections, the comparison of price margins⁶ in the milk processing industry in Estonia and the EU are presented in Figure 2. There are significant differences in the margins; however, the reasons for these findings can be manifold. High transaction costs, underdeveloped institutions, the structure of the milk industry or inefficiency can all be reasons. This obviously questions the ability of the Estonian milk sector to compete at the internal market of the EU.

Consequently, PAM will be calculated for both levels of the value added chain (farm level and processing level) and for both policy situations (pre- and post-accession). It is very likely that the market imperfections now present in the Estonian milk sector will not disappear at the moment of accession.

Figure 2: Ratio of ex-factory price of skimmed milk powder to producer price of milk in Estonia and the EU



The main advantages of PAM for the current study compared to other methods used in efficiency and competitiveness analysis are the detailed level of the analysis that PAM allows, as well as the possibility of quantifying the policy distortions and market imperfections that are present in the Estonian milk sector as indicated above.

⁶ Margin is defined as price spread – ratio of ex-factory price to farm price (for measuring price margins, see GARDNER, 1975).

3 DATA, ASSUMPTIONS AND SOCIAL VALUATION OF PAM FOR THE ESTONIAN MILK INDUSTRY

Milk production is the most important agricultural sector in Estonia, accounting for 25 % of GAO, whereas the share of milk processing in the food industry was 26 % in 2003. Estonia is a net exporter of milk; the level of self-sufficiency is estimated to be around 135 %. The EU is its main export partner: The share of milk products exported to the EU ranged between 53 % and 67 % of total exports of dairy products from 2000-2002; in 2003 the share increased to 80 %. The main export articles are milk powders, cheese and butter. The EU market is attractive for Estonia because of the higher price levels, as well as because access to the EU market was already good during the pre-accession years due to the implementation of the so-called "double zero" and "double profit" agreements.

Milk production is concentrated on large farms in Estonia. Farms with more than 100 cows provided 75 % of the total milk production in 2003, and the share has been increasing through the years. However, these farms account for only 9 % of the total number of milk farms in Estonia⁷, indicating the dual farm structure in milk production. The milk yield has increased over the years, and was 5,189 kg per cow in 2003, whereas according to the data from the Animal Recording Centre of Estonia, the milk yield per cow is higher in bigger herds. The number of raw milk processing enterprises was 31 in 2003, whereas eight of these enterprises purchased circa 90 % of the raw milk in 2003.

In general, PAM is a tool for static and short-term analysis. In order to provide a more dynamic view of the patterns of competitiveness, four years, from 2000-2003, are included in the model. The sample includes 104 specialised milk farms that appear in the FADN⁸ database through all four years. The share of milk of total sales of the farms accounted for 90 %, on average, across the farms in the sample. No attempt was made to disaggregate farm costs into the costs occurred in milk production and other costs. This would have necessitated many additional assumptions as this data is not readily available.

PAM entries, as well as ratios, are derived for each individual firm. In addition, farms are also divided according to their size into five groups in order to gain insight to the competitiveness and performance of different sized groups which have quite different characteristics (e.g. yield, land and labour use, organisation type) as indicated in Table 2.

Smaller farms are mostly family farms, while larger farms are mostly partnerships or limited liability companies. A striking difference between family farms and enterprises is the use of paid labour – the share of family farms lies between 10-20 %, while larger farms rely almost 100 % on paid labour. The wages paid

⁷ Data from the YEARBOOK OF THE ANIMAL RECORDING CENTRE IN ESTONIA.

⁸ FADN – Farm Accountancy Data Network.

on bigger farms is twice as high as in the small family farms. This most likely reflects the differences in labour productivity. The share of rented land is high for all farms.

Data for processing plants is based on business plans for the 9 largest enterprises in 2001-2004; however, all enterprises are not represented in the sample in all four years. The data for 2004 are estimates provided by the enterprises themselves. In 2003, the coverage of the analysed enterprises accounted for 88 of total raw milk processed in Estonia.

In the EU scenarios, raw milk prices and milk product prices changed in line with the levels agreed on for CAP reform. Based on the hectares and animals in each individual farm, the Simplified Area Payment Scheme, as well as area and headage payments (top ups) for the years following accession are introduced. Domestic factor costs are assumed to increase gradually.⁹

Table 2: Characteristics of analysed milk farms in 2003

| | Farm groups according to number of cows | | | | | |
|---------------------------------------|---|----------------|----------------|----------------|----------------|----------------|
| | ...19 | 20...49 | 50...99 | 100...199 | 200... | All |
| Number of farms/family farms | 39/39 | 37/37 | 12/8 | 8/1 | 8/0 | 104/85 |
| Average number of cows | 13 | 32 | 70 | 136 | 421 | 67 |
| Share of milk produced % | 7 % | 18 % | 11 % | 14 % | 49 % | 100 % |
| Share of milk in sales of a farm % | 86 % | 91 % | 86 % | 93 % | 89 % | 89 % |
| Average yield (kg/cow) | 5,704 | 5,846 | 5,192 | 5,211 | 5,573 | 5,648 |
| Average land usage ha | 53 | 140 | 356 | 502 | 1,261 | 247 |
| ...of which was rented | 42 % | 48 % | 66 % | 92 % | 86 % | 72 % |
| Share of paid labour | 10 % | 21 % | 70 % | 98 % | 100 % | 72 % |
| Average wage per hour EEK (in EUR) | 16.0 (1.03) | 17.6 (1.13) | 19.4 (1.24) | 26.6 (1.71) | 33.4 (2.14) | 20.9 (1.34) |

Source: Own calculations based on FADN database.

Several assumptions are necessary to conduct the PAM calculations concerning estimations of social prices. The markets for tradable inputs are assumed to be undistorted and actual prices are used in calculations. The supply approach¹⁰ is used to calculate the opportunity cost of capital in this study. For social valuation, capital interest of long-term deposit was used.

⁹ The projections of the Ministry of Finance for wage increases are used; the increase in fuel excise tax is taken into account, as well as a gradual but small increase in land costs.

¹⁰ For more discussion of the supply and demand approach in valuation of capital opportunity cost, see TSAKOK, 1990, pp. 110 ff.

Non-tradable intermediate inputs were disaggregated to domestic factors and traded components with the help of supply and use tables provided by the Statistical Office of Estonia.

For the social valuation of tradable inputs, estimating the equilibrium exchange rate is necessary. There are a number of studies conducted by the Bank of Estonia which estimate the equilibrium exchange rate. The results of the studies differ slightly; however, the broad conclusion is that exchange rate misalignment (undervaluation) occurred before the Russian crisis (before 1998), but stabilised afterwards, and the overvaluation of the Estonian Kroon was between 0 % and 1 % in 2000 and 2001¹¹, respectively. Hence, for the purposes of the current study, the assumption can be made that the exchange rate is in line with the equilibrium exchange rate.

Twenty percent of Estonia's total agricultural land was not used in 2001¹². When land is abundant, traditional approaches for estimating opportunity cost by evaluating the returns of the land used in the next best alternative cannot be applied, because there is probably no better alternative. Therefore, the opportunity cost of land is considered to be equal with the private value.

Estimating the opportunity cost of labour is complicated in the agricultural sector. In the case of full employment, the average wage in the sector could be used. In Estonia, the average unemployment rate from 2000-2002 was 11.6 %. However, the unemployment in Estonia is in most cases "structural", meaning that there is a mismatch between the skills of the unemployed and existing job vacancies (JÄRV, 2003). For farms, the average wage in the agricultural sector is applied as an opportunity cost. In the processing sector, the average wage in the milk sector is used as an opportunity cost.

The social valuation of raw milk is somewhat complicated, as raw milk is not tradable and there is no world market for raw milk. As Estonia is a net exporter of milk, the export prices (f.o.b.) are used to derive the representative raw milk price. The model suggested by SCHANK (2003) for calculating a milk price equivalent specifically for Estonia is used, as it includes up-to-date processing, handling and transport costs as well as technical coefficients to derive the raw milk price equivalent from skimmed milk powder and butter prices.

4 RESULTS

Indicators of competitiveness and comparative advantage for farms are presented in Table 3. In total, farms were competitive (PCR below 1) throughout the entire period, except in 2000, although the ratios were very close to one in

¹¹ See, for example, FILIPOZZI, 2000; COUDERT and COUHARDE, 2002.

¹² Agricultural Census, STATISTICAL OFFICE OF ESTONIA.

other years. When looking at farm groups according to number of cows, the smallest farms, with less than 19 cows, were not competitive through the period (PCR above 1). The most competitive farm groups were those with 20 to 200 cows.

Table 3: Selected results for FADN milk farms

| | | ...19* | 20...49* | 50...99* | 100...199* | 200...* | All farms |
|-----|------|--------|----------|----------|------------|---------|-----------|
| PCR | 2000 | 1.82 | 1.22 | 1.10 | 1.14 | 1.18 | 1.26 |
| | 2001 | 1.02 | 0.87 | 0.72 | 0.89 | 0.92 | 0.93 |
| | 2002 | 1.09 | 0.86 | 0.82 | 0.92 | 0.97 | 0.96 |
| | 2003 | 1.16 | 0.75 | 0.80 | 0.74 | 0.97 | 0.94 |
| DRC | 2000 | 2.59 | 1.79 | 1.50 | 1.28 | 1.15 | 1.36 |
| | 2001 | 0.98 | 0.83 | 0.67 | 0.72 | 0.80 | 0.87 |
| | 2002 | 1.49 | 1.19 | 1.14 | 1.29 | 1.03 | 1.29 |
| | 2003 | 1.43 | 0.97 | 1.07 | 0.91 | 1.01 | 1.17 |

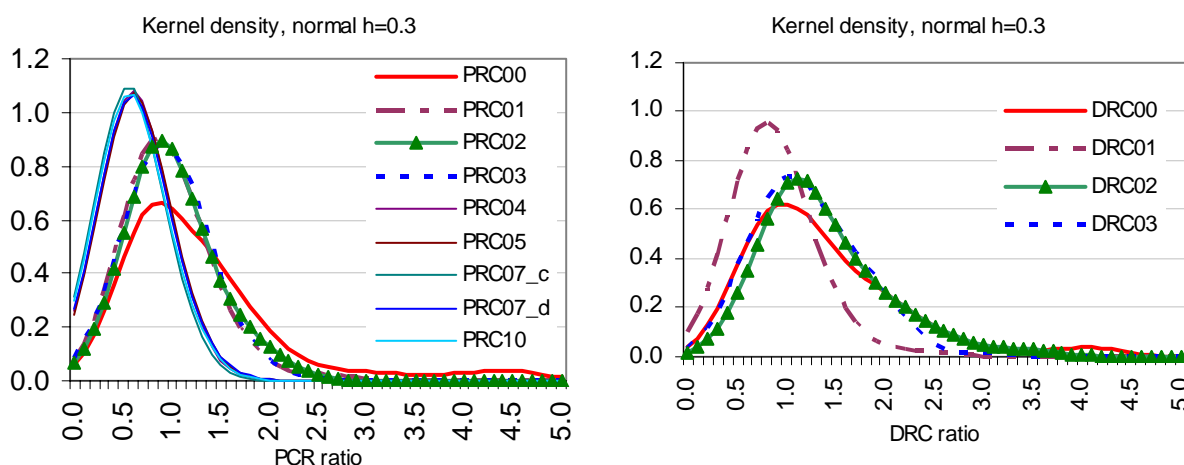
Source: Own calculations.

Note: * Number of cows.

In Figure 3, the Kernel distributions of PCR for individual farms in the sample are shown for different years. We can observe that in 2000, the distribution curve had a significantly lower peak than the three following years which have similar shapes, indicating the worst situation for competitiveness in 2000.

The introduction of the EU scenarios shifts the distribution curves further to the left, indicating that more farms become competitive. In spite of the ‘phasing in’ of direct payments, the results for the scenarios of 2005, 2007 and 2010 have very similar distributions. It seems likely that the increases in direct payments offset a gradual increase in production costs. Also, there does not appear to be significant a difference for the farms in the sample whether the payments are coupled or are decoupled, as indicated by the two scenarios for 2007 (2007_c with coupled payments, and 2007_d with decoupled payments).

Figure 3: Distribution of the PCR and DRC for milk farms



Source: Own calculations.

Results for comparative advantage are not as favourable as for competitiveness. The only year when the average DRC indicator was below one, indicating comparative advantage, was 2001. That was mainly due to the favourable domestic and world market conditions. Also, in 2003 two groups of farms had a DRC ratio of less than one (see Table 3).

The distribution of the DRC over time clearly indicates a favourable situation in 2001 and the worst in 2000, whereas in 2002 and 2003, similar distributions are observed. This volatility of results from year-to-year can mainly be attributed to the lack of domestic raw milk price adjustment to the price developments in international markets. The latter also points to the lack of stability for milk farms, as the situation on the Estonian milk market has been heavily dependent on export opportunities.

Revenue transfers were negative in 2000 and 2001 (see Table 4). The decomposition of the distortions shows that negative transfers were caused by market distortions and positive transfers from the government did not offset them. In 2003, market transfers were also negative. It appears that the milk producers were implicitly taxed due to the distortions in the market. The EU scenario indicates that transfers to the farms will significantly increase due to explicit policies, as well as market price support.

Table 4: Revenue transfers for milk farms

| | Revenue transfers | | | | |
|------------------|-------------------|--------|-------|-------|-------------|
| | 2000 | 2001 | 2002 | 2003 | EU scenario |
| Total transfers | -2.30 | -16.89 | 51.02 | 28.34 | 171.63 |
| Policy transfers | 29.97 | 29.67 | 44.75 | 35.43 | 74.63 |
| Market transfers | -32.27 | -46.56 | 6.27 | -7.09 | 97.00 |

Source: Own calculations.

Results for the milk processors are relatively mixed for both competitiveness and comparative advantage. Some companies are competitive over the years under analysis, but there are companies whose competitiveness improves or worsens during the period. Export-oriented enterprises, compared to those concentrating on the domestic market, are more competitive (the ratios are significantly below one). Enterprises oriented towards the domestic market were competitive only in 2004, whereas in 2002-2003, the value added was less than factor costs (see Figure 4).

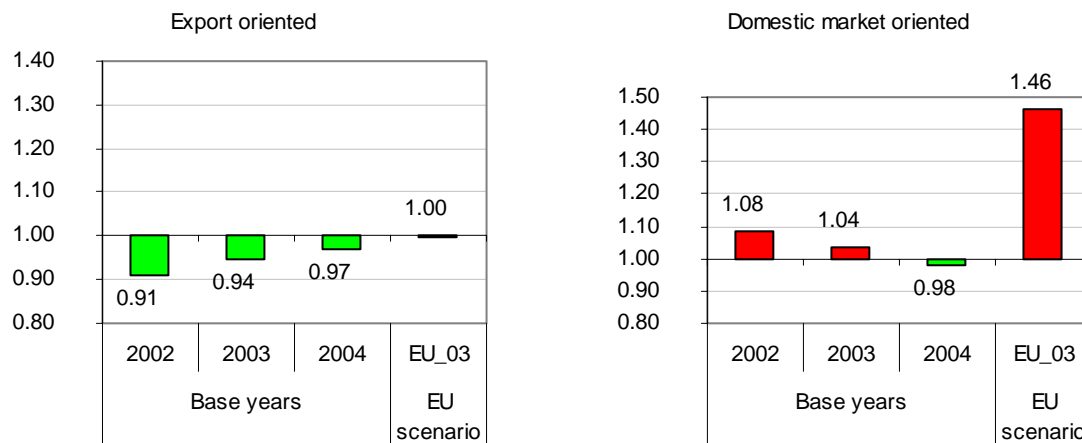
Export-oriented processors' access to markets with higher price levels (mainly the EU) can explain these findings, although the export opportunities, as well as prices of exported products, vary over the years. Companies oriented toward the domestic market face relatively stable output prices, but the price level is dependent on purchasing power. Nevertheless, the fact that consumer prices of milk products in Estonia are already relatively close to consumer prices in some

EU countries (for example Germany) only confirms the inefficiency of these processors. However, the PRC ratio moved down towards one and was even below one in 2004, which shows an increase in competitiveness and indicates improvement in efficiency. The ratio for the exporters, however, has moved closer to one year-to-year.

The EU accession scenario shows a worsening in the competitiveness for export-oriented and domestic-oriented enterprises. The situation would be much more difficult for the domestic market-oriented enterprises, which is mainly due to increasing input costs, whereas no immediate increase is expected in output prices.

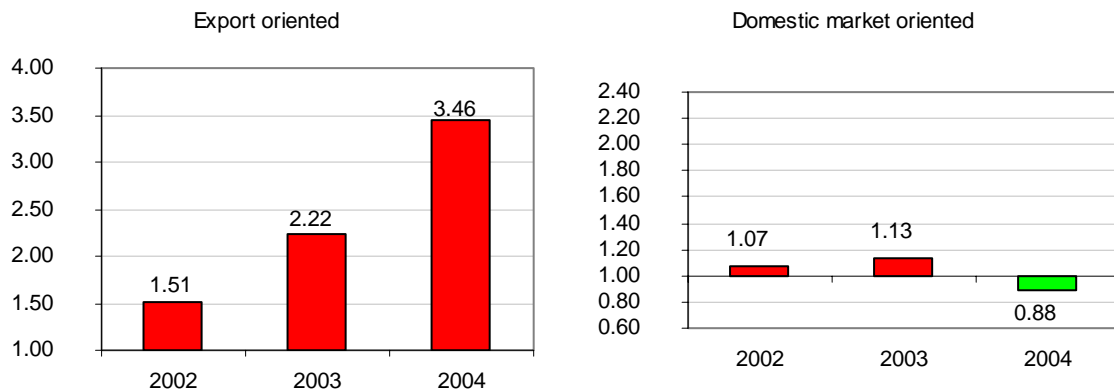
The processing industry possesses no comparative advantage according to the development of the DRC indicator (see Figure 5). None of the analysed enterprises has a DRC ratio below one for any analysed years. However, domestic market-oriented enterprises have an indicator much closer to one, and even below one in 2004. This suggests that in the longer term, considering the CAP reform and market liberalisation, the situation for export-oriented enterprises could turn unfavourable.

Figure 4: PCR results for export-oriented and domestic market-oriented milk processing enterprises



Source: Own calculations.

Figure 5: DRC results for export-oriented and domestic market-oriented milk processing enterprises



Source: Own calculations.

Revenue transfers for processing enterprises have been positive through the years (except 2001); although the level of distortions has varied, and export-oriented enterprises have enjoyed much higher transfers. On the cost side, distortions in 2001 and 2003 for domestic-oriented enterprises were negative, meaning that private input costs were lower than social costs and the industry was implicitly subsidised. In 2004, distortions in costs significantly increased and are expected to increase further after accession. The latter indicates implicit taxation of the processing industry through higher input costs. This is possible, as limited supplies of raw milk and the existing overcapacities of processing enterprises force them to increase raw milk purchase prices in order to guarantee supplies of raw milk and market share.

The nominal protection coefficient on output (Table 5) shows that, on average, the industry received higher revenues than they would if no distortions were present, with the exception of 2001. The nominal protection coefficient on inputs indicates that in 2001, the input costs were lower than those calculated with social prices; it surpassed one in 2002, and increased during every one of the following years.

Table 5: Selected PAM results for processing enterprises (EEK/100 kg processed raw milk)

| | Distortions in revenues | | Distortions in costs | | Total distortions | | NPCO | | NPCI | |
|------|-------------------------|-------------------|----------------------|-------------------|-------------------|-------------------|-----------------|-------------------|-----------------|-------------------|
| | Export oriented | Domestic oriented | Export oriented | Domestic oriented | Export oriented | Domestic oriented | Export oriented | Domestic oriented | Export oriented | Domestic oriented |
| 2001 | -12.8 | 0.0 | -20.2 | -27.5 | 7.5 | 27.5 | 0.98 | 1.00 | 0.95 | 0.98 |
| 2002 | 106.6 | 6.7 | 13.7 | 11.8 | 92.9 | -5.0 | 1.31 | 1.01 | 1.02 | 1.01 |
| 2003 | 124.8 | 14.4 | 10.6 | -8.8 | 114.2 | 23.2 | 1.40 | 1.03 | 1.01 | 1.01 |
| 2004 | 219.7 | 19.5 | 45.3 | 53.6 | 174.4 | -34.0 | 1.62 | 1.03 | 1.07 | 1.06 |
| EU | 214.5 | 14.5 | 105.0 | 82.3 | 109.5 | -67.8 | 1.61 | 1.03 | 1.18 | 1.15 |

Source: Own calculations.

According to the EU scenario, positive transfers in revenues will not increase, but decrease. Distortions in costs will increase. Total transfers after EU accession remain negative for domestic market-oriented processors and positive for export-oriented processors in the short term. The nominal protection coefficient on inputs for export-oriented enterprises increased significantly in 2004 and will stay the same level after the accession.

5 CONCLUSIONS

A mixed picture arises from analysing the competitiveness of the Estonian milk sector. Competitiveness varies across different years as well as farm sizes. Farms with 20 to 200 cows were competitive through the period under the analysis. The projections of competitiveness after accession are rather favourable for milk farms in the short and medium term. A shift is expected after the enlargement in competitiveness, whereas "phasing in" direct payments later on will not improve the situation further, as input costs are also expected to increase. Milk farms as a whole have no comparative advantage in Estonia and EU accession will not improve this situation.

For milk processing enterprises, the choice of strategy appeared to be important. The results of the analysis for milk processors showed that exporters were more competitive than domestic market-oriented enterprises, although the latter create higher value added. There are several reasons for this. The EU granted favourable access for bulk products during the pre-accession years for Estonia. Higher price levels in the EU provided incentives for Estonian processors to take full advantage of these concessions and motivated processors to develop. Consequently, low attention was given to the development of value added products, as well as on marketing and promotion activities. Only during recent years has attention turned to the development of more value added products.

In general, EU accession is expected to decrease the competitiveness of milk processors. In the long term, particularly in the light of the CAP reform (as the market price support for bulk products is expected to decrease) the exporters of these products will face lower returns. Thus, the enterprises oriented towards higher value added products might gain an advantage over current exporters.

REFERENCES

- BOGALE, A., HAGEDORN, K., ABALU, G. (2002): Implications of agricultural land degradation to the profitability and competitiveness of subsistence farmers: A comparative study from rural Ethiopia, *Journal of Agriculture in the Tropics and Subtropics*, Vol. 103 (1), pp. 61-71.
- BOJNEC, S. (1999): The competitiveness of Slovenian farms and food processing activities, *Agrarwirtschaft*, 48 (H. 8/9), pp. 295-303.
- BRANDT, H. (1998): Die Estnische Landwirtschaft in der Transformation – Situation und Ausblick im Frühjahr 1998, *Berichte über Landwirtschaft*, 76 (4), pp. 649-659.
- COUDERT, V., COUHARDE, C. (2002): Exchange rate regimes and sustainable parities for CEEC in the run-up to EU membership, paper presented at International Conference "Towards Regional Currency Areas" CDC, CEFI, CEPAL, CEPIL, Santiago de Chile.
- FILIPOZZI, F. (2000): Equilibrium exchange rate of the Estonian Kroon, Its dynamics and impacts of deviations, BANK OF ESTONIA (ed): *Working Paper No. 3*, Tallinn.
- FROHBERG, K., HARTMANN, M. (1997): Comparing measures of competitiveness, *IAMO Discussion Paper No. 2*, Halle (Saale).
- GARDNER, B. L. (1975): The farm-retail price spread in a competitive food industry, *American Journal of Agricultural Economics*, Vol. 75 (3), pp. 399-409.
- GUBA, W. (2000): Competitiveness of Polish milk processing industry during the integration to the European Union – Analysis of dynamic comparative advantages, Doctoral Dissertation, Göttingen.
- HOLZNER, J. (2004): Eine Analyse der internationalen Wettbewerbsfähigkeit der Milcherzeugung an ausgewählten Standorten in Ostdeutschland, der Tschechischen Republik und Estland, Sonderheft 264, Landbauforschung Völkenrode, FAL Agricultural Research, Braunschweig.
- JÄRV, K. (2003): Developments in the labour market and labour mobility. The case of Estonia, paper presented at the OECD Workshop on "Agricultural and Rural Development Policies in the Baltic Countries", Tallinn, 10.-12.06.2003.
- KAVICIC, S., ERJAVEC, E., STOFOROS, C., MERGOS, G. (2001): Agricultural Policy Analysis Simulator (APAS) and Policy Analysis Matrix (PAM) for Slovenian agriculture, in: HECKELEI, T., WITZKE, H. P. (eds): *Agricultural Sector Modelling and Policy Information Systems*, Wissenschaftsverlag Vauk Kiel KG, Kiel.
- KRAY, H. A. (2002): Agro-food policies in Slovakia and Bulgaria. A qualitative analysis, Wissenschaftsverlag Vauk Kiel AG, Kiel.
- KUHAR, A., ERJAVEC, E. (2005): Implication of the Slovenian EU accession for the agro-food sectors, paper presented at 89th EAAE seminar "Modeling Agricultural Policies: State of Art and New Challenges", Parma, 02.-05.02.2005.

- KÖTSCHAU, K. M., PAWLOWSKI, I., SCHMITZ, P. M. (2003): Die Policy Analysis Matrix (PAM) als Instrument zur Messung von Wettbewerbsfähigkeit und Politikeinfluss – Zwischen Theorie und Praxis: Das Fallbeispiel einer ukrainischen Molkerei, ZENTRUM FÜR INTERNATIONALE ENTWICKLUNGS- UND UMWELTFORSCHUNG, JUSTUS-LIEBIG UNIVERSITÄT GIESSEN (ed.): *Diskussionsbeiträge No. 10*, Giessen.
- MELYUKHINA, O. (2003): Policy and non-policy sources of agricultural price distortions: Evidence from the measurement of support in selected transition economies, in: OECD (ed.): *Agricultural Trade and Poverty: Making Policy Analysis Count*, Paris.
- MONKE, E. A., PEARSON, S. R. (1989): *The Policy Analysis Matrix for agricultural development*, Cornell University Press.
- MORRISON, J., BALCOMBE, K. (2002): Policy Analysis Matrices: Beyond Simple Sensitivity Analysis, *Journal of International Development*, Vol. 14, pp. 459-471.
- NGUYEN, M. H., HEIDHUES, F. (2004): Comparative advantage of Vietnam's rice sector under different liberalisation scenarios – A Policy Analysis Matrix (PAM) study, INSTITUTE FOR AGRICULTURAL ECONOMICS AND SOCIAL SCIENCES IN THE TROPICS AND SUBTROPICS (ed.): *Discussion Paper No. 01/2004*, Forschung zur Entwicklungsökonomie und -politik – Research in Development Economics and Policy.
- SCHANK, A. (2003): Uus piima hinna avutamise mudel on olemas [New model for calculating milk price in Estonia], in: Piimafoorum 2003, Tartu.
- SIGGEL, E. (2003): Concepts and measurement of competitiveness and comparative advantage: Towards an integrated approach, paper presented at the International Industrial Organization Conference at Northeastern University, 04.-05.04.2003.
- STAAL, S. J., SHAPIRO, B. I. (1994): The effects of recent price liberalization on Kenyan peri-urban dairy: A case study using the policy analysis matrix approach, *Food Policy*, Vol. 19 (6), pp. 533-549.
- TANGERMANN, S., SWINNEN, J. (2000): Conclusions and implications for food and agricultural policy in the process of accession to the EU, in: TANGERMANN, S., BANSE, M. (eds.), *Central and Eastern European Agriculture in an Expanding European Union*, CAB International.
- TSAKOK, I. (1990): *Agricultural price policy. A practitioner's guide to partial equilibrium analysis*, Cornell University Press, New York.
- WILLIAMS, R. E. (1997): The political economy of the common market in milk and dairy products in the European Union, FAO (ed.): *FAO Economic and Social Development Paper 142*, Rome.
- YAO, S. J. (1999): Efficiency impacts of government policy on agricultural production in the presence of externalities, *Journal of Environmental Management*, 55 (1), pp. 57-67.

INSTITUTIONAL FRAMEWORK FOR MARKETS

BUILDING SUSTAINABLE SUPPLY CHAINS: THE ROLE OF INSTITUTIONS

JILL E. HOBBS¹

ABSTRACT

The paper discusses the role of institutions in fostering a competitive market economy and encouraging growth and investment in the agri-food sectors of transition countries. The transition process has progressed with different degrees of success in Central and Eastern European (CEE) countries, as evidenced by striking differences in broad measures of economic performance. Embryonic or poorly functioning institutions explain some of the challenges to the transition process. The paper draws on Transaction Cost Economics to show how the institutional environment affects transaction costs, and the resulting implications for supply chain relationships. An array of institutions that guide the invisible hand of the market are discussed. These include, market information and quality measurement institutions, establishment and enforcement of property rights, credible contract law and dispute settlement mechanisms, corporate governance laws and financial institutions.

Keywords: *Transaction costs, institutions, contracts, information asymmetry, transition.*

1 INTRODUCTION

The transition from a centrally planned to a market economy is a long and difficult process. Central and Eastern European (CEE) countries have been making this transition at different speeds and with varying degrees of success. A critical component of the transition process is the institutional environment within which transition occurs. The institutional environment guides the ‘invisible

¹ Department of Agricultural Economics, University of Saskatchewan, Canada,
Email: jill.hobbs@usask.ca.

hand' of the marketplace. In most modern market economies, the institutional environment is often taken granted; it exists in the background, serving to facilitate the smooth functioning of market transactions and (usually) the maintenance of a stable investment climate. Transition involves the establishment and adaptation of institutions, a process fraught with uncertainty. Failure to establish an efficient and credible institutional environment raises the transaction costs of doing business, stunting economic growth and deterring investment. This paper examines the effect of the institutional environment on transaction costs, investment and growth in agri-food supply chains in transition countries.

After more than a decade of 'transition', the widening gulf between CEE countries with respect to economic performance is marked. Ten years after the onset of transition, Poland, Hungary and the Czech Republic had achieved notably higher levels of real GDP compared with other transition countries, such as Lithuania. The Commonwealth of Independent States (CIS) countries have tended to fare even more poorly, with average real GDP in 2000 estimated at an index value of 62 (1990=100) compared with an average of 106 for countries of Central and South-eastern Europe and the Baltics (WORLD BANK, 2002). Inflation rates also differ markedly across these countries, with average inflation over 1990-2000 ranging from 13 percent in the Czech Republic to 102 percent in Romania and 244 percent in Belarus (WORLD BANK, 2002). Inequality, as measured by Gini coefficients, that relate the proportion of income earned to the proportion of the population, increased markedly in Ukraine and other CIS countries over the first decade of transition, compared to more modest increases in most CEE countries. Rather than educational premiums and wage dispersion, this inequality has been attributed to widespread corruption, rent seeking and state capture by vested interests (WORLD BANK, 2002), all of which are symptomatic of a weak institutional environment.

In an analysis of institutional performance in transition economies, WEDER (2001) identifies five clusters of countries, grouped by institutional performance². Poland, Hungary, the Czech Republic, Slovenia and Estonia lie in the first (highest) cluster, while other CEE countries (e.g. Romania, the Slovak Republic), lie in the second cluster, with most CIS countries lying in the lowest three clusters. The clear message is that the 'transition' countries, although by no means uniform to start with, have undergone very different transition processes in terms of policy reform and institutional development.

² WEDER'S measure of institutional performance is an amalgam of various aspects of the economic and business environment, derived from private sector surveys of firms and expert surveys of country risk assessment firms. The variables include evaluations of the rule of law, graft, regulatory burden, government effectiveness, political instability, credibility of government announcements, judiciary reliability, property rights enforcement, bribes, freedom from discretionary bureaucrats, and more.

Initial conditions (geography, history, price and output distortions) and the external shocks associated with the break-up of the Soviet Union, war and civil strife may be valid explanations for much of the output decline witnessed in CIS countries in the early 1990s. However, it has been argued that these are far less persuasive explanations of later economic differences between transition countries. Instead, a key factor has been the effectiveness of policies and the evolving institutional environment in disciplining the 'old' (state) sector and encouraging growth and investment in the new business sector (WORLD BANK, 2002).

Privatisation by itself, while a necessary condition for transition to an efficient functioning market economy, is by no means a sufficient condition. In the absence of an effective, credible and transparent institutional environment, the expected gains from privatisation will not be realised. The neoclassical economic paradigm, with its core assumptions of perfect information, efficient (unhindered) allocation of resources and competitive markets takes as given the institutional environment within which transactions occur. Neoclassical economic analysis concentrates on equilibrium outcomes, without consideration of how transactions occur; by default it assumes a frictionless economic environment. To understand the challenges facing the CEE countries in encouraging economic growth and establishing a stable climate for business investment, it is necessary to augment the traditional neoclassical model of rational self-interested individuals and firms with insights from the Transaction Cost Economics (TCE) branch of New Institutional Economics.

2 TRANSACTION COSTS

Transaction costs encompass a spectrum of institutional costs related to exchange, when we no longer assume information to be costless. Included are the costs of gathering information, of negotiation, of drawing up and enforcing contracts, of delineating and policing property rights, of monitoring performance and enforcing contractual agreements (CHEUNG, 1987).

TCE recognises that economic agents are *boundedly rational* in their capacities to evaluate all possible alternative outcomes of a decision (SIMON, 1961). When combined with situations of uncertainty and complexity, bounded rationality forces agents to incur higher transaction costs and may lead to sub-optimal decisions. Uncertainty and complexity have been characteristics of transition economies as institutions emerge and evolve, the rules change, and new business relationships are formed (and flounder). Indeed, RADAEV (2001) argues that far from decreasing transaction costs, the uncertainty that emerged from the development of new institutions increased the transaction costs facing firms due to poorly structured and weakly enforced rules.

Opportunism, or self-interest seeking with guile (WILLIAMSON, 1979), becomes a problem in the presence of small-numbers bargaining when agents can exploit a situation to their own advantage. Bounded rationality implies that other agents cannot identify, with any degree of certainty *ex ante*, the potential for opportunistic behaviour. If the privatisation process has resulted in a monopoly or a small number of firms dominating an industry, then a small-numbers bargaining situation exists. It may also exist in industries with an outwardly competitive structure if investments in specific assets, which cannot be contractually safeguarded, reduce a firm's effective transaction partners to a small-numbers bargaining situation.

Asset specificity arises when one party to an exchange has invested in resources specific to that exchange, with little or no value in an alternative use (KLEIN et al., 1978) and is vulnerable to the other party opportunistically attempting to appropriate rent from the investment. Bounded rationality and/or a weak institutional environment with poorly defined (and poorly enforced) property rights preclude the development of a fully contingent and enforceable contract to govern this transaction. In the absence of credible contractual protection, the hold-up problem occurs and prevents the transaction from occurring. The hold-up problem is particularly troublesome in a transitioning economy, wherein new investments are essential to long-term economic growth.

Finally, TCE relaxes the full or perfect information assumption of the traditional neoclassical model, recognising that many transactions are characterised by *information asymmetry*. In the presence of adverse selection, institutions to reduce buyer measurement costs or protect the contractual rights of buyers are necessary to prevent market failure. Bureaucratic rules may be subject to moral hazard if officials can abuse their position of power within the institutional structure. Moral hazard can also be a problem in shareholder-managerial relations if actions by management to maximise their own self-interest at the expense of the shareholders are not directly observable by the owners of the enterprise. The practice of "tunnelling" is a prime example of moral hazard. Tunnelling involves the legal expropriation of income and shareholder assets, for example, through diverting cash flows and asset stripping. It has been identified as a particular problem in many transition economies (WORLD BANK, 2002; NUREEV and RUNOV, 2001).

Transaction costs arise in the process of searching for information prior to a transaction, in negotiating the transaction and in monitoring and enforcing the transaction.

2.1 Search costs

Search, or information, costs arise directly from the information asymmetry that characterises many transactions. Economic agents incur search costs in gathering information about products, prices, the reliability of buyers (suppliers), etc. A raft of private and public sector institutions act to reduce these information costs, for example, communication systems: Telecommunications, the Internet, postal systems, electronic (radio, television). Fostering competitive markets in the communications sector is an important role of government policy.

The provision and dissemination of business information can also reduce information costs. In many commodity markets, buyers and sellers have easy access to price information through a variety of institutions. These include print media (e.g. agricultural commodity prices are published regularly in the farming press and in local newspapers), commodity futures exchanges, and through industry associations that collate and publish price and market trend information (HOBBS et al., 1997).

Buyers incur information costs in ascertaining the true quality of a good, particularly when the product has experience or credence attributes that are important to the purchase decision³. BARZEL (1982) argues that buyers use proxy measures of value, leading to measurement errors and a divergence between the price of a product and its valuation by the consumer. If buyers incur high measurement costs, the net price they are willing to pay for the product (posted price net of the costs of measurement) is reduced. Typically in consumer markets, multiple buyers must incur information costs as they sort goods to estimate their true value, whereas if a seller were to incur the costs of value measurement, products would be measured once. It is often in the seller's interest to incur product quality measurement costs to reduce the incentive for costly sorting activities on the part of buyers. BARZEL concludes that institutions arise to reduce the costs of measurement.

Firm-level strategies to reduce buyers' measurement cost include branding and product warranties. Industry-wide initiatives include commodity grading schemes, quality assurance and certification systems – usually with third party verification to strengthen the credibility of the quality signal. The government's role in this case may be limited to ensuring that the institutional environment is in place to facilitate third party verification of grading schemes, quality assurance and certification systems. Establishing the regulatory environment to protect consumers from fraudulent labelling claims and product adulteration is also an impor-

³ Experience attributes are those that a consumer cannot evaluate until after purchasing and consuming the good, for example, the tenderness of a steak. Consumers are unable to detect or evaluate credence attributes even after purchase and consumption, for example, organically produced food.

tant function of government. The role of market information and quality verification institutions in the agri-food sector of CEE countries is discussed in section 4.

2.2 Negotiation costs

Negotiation costs arise from the physical act of the transaction, and include the costs of negotiation and drawing up contractual agreements, and the use of an intermediary, such as a broker, etc. In the presence of high levels of uncertainty and a weak institutional environment, writing fully contingent contracts is costly, or even impossible. Without effective commercial contract laws, negotiation costs will be higher. Financial institutions reduce negotiation costs by facilitating payment over time and distance and by providing access to a source of credit. The role of financial institutions in the agri-food sectors of transition countries is discussed further in section 4.

2.3 Monitoring and enforcement costs

Monitoring and enforcement costs arise after the transaction has been agreed to, and include the costs of monitoring the actions of transaction parties, monitoring the quality of goods and, if necessary, enforcing the terms of the transaction in the event of abrogation by the other party. A transparent and enforceable system of property rights, an effective commercial legal system and judiciary, a reliable financial system and enforceable rules of corporate governance are all components of the institutional environment that help to mitigate monitoring and enforcement costs. In the absence of these institutions, or if they are weak or undermined by vacillating rules, opportunistic bureaucrats and inconsistent enforcement, the resulting uncertainty and high transaction costs will impede business investment and economic growth. These problems are discussed in the context of the agri-food sector in transition economies in section 4.

TCE provides predictions regarding the effect of transaction costs on vertical coordination in the agri-food sector. Contracts or vertical integration are expected to replace spot market transactions in the presence of asset specificity and uncertainty. In the absence of effective contractual safeguards, the transaction will only occur through a vertically integrated firm, or may not occur at all. Thus, transaction costs have direct implications for the incentives to invest, for long-term economic growth and for the structure of industries. The institutional environment within which transactions occur is critically important in determining the nature, level and distribution of those transaction costs. Several facets of that institutional environment have already been alluded to, however, a number deserve closer attention within the context of transitioning economies. Marketing information institutions, legal institutions, particularly the system of property rights, financial institutions and the rules of corporate governance are areas in which considerable institutional uncertainty remains.

3 EVOLVING SUPPLY CHAIN RELATIONSHIPS

New supply chains are emerging in the agri-food sector, although in some cases, appropriate infrastructure to support these new supply chains has been slow to develop. A lack of institutions such as commodity exchanges, wholesale markets and auctions, and inadequate quality measurement and verification institutions has meant that clear market signals are lacking in some transition countries. Supply chain relationships run the spectrum from loose arrangements characterised largely by spot market transactions, through more formal contractual agreements, to internal co-ordination by a firm vertically integrated across several stages of production, processing or distribution. TCE posits that an organisational form will emerge that minimises the sum of production and transaction costs (WILLIAMSON, 1979). Transaction costs are influenced by the institutional environment within which the transaction occurs.

Auction markets can be an efficient price-discovery and market clearing mechanism for agricultural commodities. Auction prices are usually public information and represent an important source of price information to assist price discovery in other direct sales relationships between producers and processors⁴. Auctions therefore reduce price information costs for farmers and processors even if these firms do not trade through the auction market directly (HOBBS, 1997).

The auction company is a private entrepreneur, earning a commission from the seller of the auctioned item. The auctioneer acts as an intermediary between buyer and seller, usually paying the seller immediately following the sale, before seeking payment from the buyer. Therefore, auction companies can be an important industry development institution in fledgling sectors when processors are prone to defaulting on payments, and farmers face high transaction costs in evaluating the reliability and financial stability of a potential buyer. However, this also means that auction companies will bear greater risks in transition economies, given higher levels of uncertainty. This is likely to be reflected in higher commissions charged by the auction company to reflect the increased risk of buyers defaulting on payment. Strengthening bankruptcy laws to protect creditors is an important institutional development in ensuring the effective operation of auction markets, and is discussed in more detail in section 4.3. An auction system also needs to be backed by an effective and enforceable commercial legal system that confers upon buyers a legal obligation to pay for commodities purchased at the auction (see section 4.4).

In many agricultural commodity sectors in western Europe and North America, auction markets, while once prevalent, are becoming less important as transactions move away from a traditional spot market basis to closer vertical co-ordination

⁴ Provided that a sufficient volume is traded through the auction system, avoiding the thin market problem.

through direct sales relationships and contracts. Although auctions are a transparent and competitive method of price discovery (assuming a sufficient number of buyers), for some products they may impede the efficiency with which price signals are transmitted from consumers to producers. In an auction, price is usually based on a visual assessment of quality and may not capture all of the quality dimensions of interest to buyers if these quality dimensions have experience and credence properties. For example, the baking qualities of wheat are difficult to determine on the basis of a visual inspection of the kernel. Production method attributes such as organic or environmentally friendly cropping practices and livestock feeding or welfare protocols cannot be determined on the basis of a visual inspection of the commodity or final product. Auctions may be inefficient price transmission mechanisms for these quality attributes.

As an alternative to spot market transactions, contracts represent more formal, longer-term supply relationships. Contracts allow farmers to lock in a market for their product, and provide buyers with the opportunity to specify production processes that more closely match their market needs. However, viable contracts are dependent on the development of an appropriate institutional environment. If considerable uncertainty permeates business transactions in a transition economy, designing complete (fully contingent) contracts is problematic. Weak legal institutions for the enforcement of contracts compound this problem and deter investment. Firms will be reluctant to make asset-specific investments if there are insufficient safeguards to protect these investments⁵.

In many cases, the emerging private farm sector in transition economies has had to contend with downstream market power in the form of oligopsonistic or regionally monopsonistic buyers. Market power in the first-stage of agricultural processing has long been a contentious issue in many developed western market economies. Joint marketing of farmers' produce through co-operatives or collective bargaining has been an important feature of some sectors. LANG (1980) shows how collective bargaining in US crop and horticulture sectors was able to shift the risk of product quality deterioration from farmers to processors who were more easily able to control quality. Appropriately aligning incentives with the abilities of a party to reduce joint risk by making them the residual claimant to a transaction leads to a net gain in economic welfare. An effective commercial legal system is necessary for the enforcement and long-term viability of collective bargaining agreements in the agricultural sector.

In the presence of high levels of uncertainty and asset specificity, inadequate institutions to safeguard investments will encourage firms to vertically integrate to internalise the uncertainty. This may have negative implications for competitiveness

⁵ See BOGER (2001) for an analysis of the development of hog marketing channels in Poland that identifies a number of challenges related to missing or embryonic institutions and informational barriers.

in the long-run if vertical integration facilitates greater consolidation in the agri-food sectors of transition economies. The following section examines the role of specific institutions in reducing transaction costs and facilitating the efficient functioning of markets.

4 DEVELOPING INSTITUTIONS

4.1 Information and quality measurement

Institutions of particular importance in guiding the invisible hand in agri-food markets include quality measurement and verification institutions such as commodity grading systems and third party quality certification and accreditation. In the presence of information asymmetry with respect to product quality, these institutions facilitate price discovery and pricing efficiency by allowing prices to more closely reflect the qualities demanded by the end-user.

Price information institutions are also important in facilitating the efficient functioning of markets. As indicated above, auction markets can perform this role. However, in the absence of publicly available spot market prices, private sector agents or industry associations may fulfil the price information role. For example, CANFAX, is a market information service run by the Canadian Cattlemen's Association that collects and disseminates price information and analysis.

4.2 Defining and defending property rights

Insecure property rights are a significant constraint on new investment and economic growth. A comprehensive survey of enterprises⁶ in 1999 found that over 70 percent of enterprises surveyed in Russia and Ukraine lacked confidence in the security of property rights, compared to fewer than 30 percent in Poland, Estonia and Croatia (WORLD BANK, 2002). To a large extent, differences in the security of property rights are determined by the effectiveness of legal drafting systems and the judiciary. Inadequate consultation with enterprises when drafting new laws or policies and failure to publicise new rules before their implementation were identified as major problems by businesses in transition economies, with over 90 percent stating that they were seldom or never consulted or informed about new rules (WORLD BANK, 2002). Lack of confidence in the security of property rights and the efficacy of the system of drafting rules that affect property rights is a serious impediment to investment.

Well defined (and enforced) property rights enshrine the right to make choices about a property or resource, the right to extract rents from its ownership and the

⁶ The Business Environment and Enterprise Performance Survey conducted a survey in 22 transition countries across CEE and CIS countries.

right to transfer its ownership without restriction (CHEUNG, 1982). Resources can be allocated – and reallocated – efficiently among competing users. The economic value of the resource is maximised, and overuse from a common property problem is avoided. Since ownership of property rights confers potential wealth – or loss of wealth depending on the choices made – the distribution and protection of those property rights is crucial in determining whether resources are allocated in response to economic signals or as a result of perverse bureaucratic incentives.

HANISCH et al. (2001) argue that property rights reform in transition should be analysed as a process. They distinguish between formal and effective property rights. Although the reform process may begin with the establishment of formal property rights, rational actors then bargain to establish the effective rights to land given obscure formal laws or those subject to interpretation. Thus, there are numerous actors involved in the process of establishing effective property rights. Politicians establish the ‘rule of law’, these rules are implemented by lawyers and bureaucrats, and local actors play a role in determining how property rights are exchanged to become economic rights of action or effective property rights. Rent seeking and corruption cloud the relationship between formal and effective property rights.

The security of property rights is also determined by the credibility of government policies toward private assets. If policy announcements to the effect that governments will not expropriate privately held assets are not believable they will not elicit an increase in private sector investment. In an empirical model linking the institutional environment to the efficacy of property rights protection, KEEFER and KNACK (2001) find that countries with less secure property rights and with government decision makers less constrained by political institutions had a higher ratio of public to private investment. They conclude that the security of property rights is a direct product of the broad institutional and political environment in which governments make decisions. Institutional arrangements that ensure credibility by constraining decision makers’ ability to engage in aggressive or expropriatory action towards investors are deemed essential.

4.3 Contract law and dispute settlement

Long-term business relationships between firms reduce search and negotiation costs and are conducive to investment and economic growth. Regular transactions with raw material suppliers mean that an enterprise does not have to undertake costly search activities each time new supplies are needed. Quality control is made easier by regular supply relationships, where the quality of the input is known from previous experience. Negotiation costs are reduced if a long-standing agreement on price determination can be reached rather than being re-negotiated at each delivery. Similarly, regular business relationships with buyers reduce the search costs of locating new buyers for each transaction and in continuously

establishing the trustworthiness and creditworthiness of new players. Monitoring costs are reduced if a long-term relationship with a reliable distributor is developed. The (unobserved) actions of a distributor are particularly important for perishable products, as product handling and storage affects product quality throughout the marketing chain. Long-term relationships with a trusted distributor reduce the exposure to moral hazard.

Regular business relationships often evolve naturally as the most efficient vertical co-ordination mechanism. These relationships take on various degrees of formality in terms of the contractual environment in which they are consummated. In the presence of low levels of uncertainty, information asymmetry and asset specificity, contracts may be self-enforcing. Where reputation is important and both parties have a stake in the long-term survival of the business relationship, contractual terms are honoured even in the absence of third party enforcement. Many business relationships exist on this basis within stable economic climates, where reputations are easily established and maintained, and the potential for moral hazard is low. Of course, even long-term business relationships can fail spectacularly, as was the case with the acrimonious break-up of the 95 year-old supply relationship between Firestone (Bridgestone) Tires and Ford in the US in 2001⁷.

Self-enforcing contracts are prone to failure in environments where uncertainty is prevalent. Many CEE and CIS countries have exhibited high levels of economic uncertainty during transition, with low growth rates, unemployment and opaque economic policies with respect to key macro-economic variables and business investment policy. Political uncertainty emerges from a bureaucratic system prone to graft, corruption and a bewildering array of informal rules.

If self-enforcing contracts cannot be relied upon, enforceable contract law is necessary for the establishment of long-term stable business relationships and as an inducement to investment. "Enforceable" deserves emphasis. Enshrined in a system of contract law must be the credible threat that the coercive power of the state will be brought to bear on those parties that abrogate their contractual commitments. This threat, if credible, should discourage opportunistic behaviour in an attempt to appropriate rents from asset specific investments. Yet it would be naïve to conclude that business disputes do not occur even in the presence of this credible threat. Complex contractual relationships in environments of uncertainty mean that genuine disagreements may arise over the interpretation of contractual clauses. As the transaction environment becomes more complex, attempting to

⁷ Bridgestone/Firestone and Ford were forced to recall the Firestone tires on Ford Explorers in 2000 after a series of fatal accidents caused by tire blow-outs. Both companies were sued in subsequent civil lawsuits. Ford blamed Firestone Tires. The tire company blamed Ford for problems with the design of the vehicle body. Both companies accused the other of withholding information. The dispute brought a long-standing business relationship to an abrupt, and very public, end.

write fully contingent contracts to cover every eventuality leads to ever-increasing transaction costs. Contractual gaps and the potential for legitimate contract disputes also pave the way for opportunistic renegeing on contractual obligations. An efficacious dispute-settlement institution fosters long-term business relationships, investment and economic growth.

Arbitration is a private sector institutional alternative to the court system for settling commercial disputes, and may be particularly effective in safeguarding (thereby encouraging) foreign investment. A number of arbitration systems exist and compete internationally. The arbitration details are specified in advance in a contractual agreement following well-established, yet flexible, rules for appointing arbitrators. Two parties to a contractual agreement in Poland might agree, in the event of a dispute, to use a Swiss arbitration centre, a French arbitrator and follow Canadian arbitration rules.

Parties to a dispute voluntarily agree to be bound by the decision of an arbitrator. As there is no legal enforcement of arbitration decisions *per se*, it cannot prevent overt opportunism. Nevertheless, the same could probably be said of the court system given the complexity of enforcing complex contractual agreements through the courts in an uncertain economic environment. Arbitration is useful in resolving genuine disagreements over contractual terms and obligations in a speedy, transparent and transaction-cost reducing manner. Firms may also use compliance with arbitration decisions (which are a matter of public record) to signal reputation – thus reducing information costs in establishing the credibility of new business partners (HOBBS *et al.*, 1997).

Policies that foster the development of private sector commercial arbitration centres in transition economies, together with educating the business sector about the uses of commercial arbitration could be beneficial. Arbitration is a complement to, rather than a substitute for, a commercial legal system. Private sector commercial arbitration systems survive on the basis of their success in resolving commercial disputes. Critical to this success is credibility, which in large part is a function of whether parties to a dispute abide by the decision of the arbitrator. A supportive legal framework that enforces arbitration decisions is important. However, arbitration cannot work if the legal system is used frequently to overturn arbitration decisions – a particular danger when a dispute arises between a domestic firm and a foreign firm. In those situations, national courts might overturn arbitration decisions if they are seen to contravene domestic legislation, if third parties might be adversely affected by the arbitration decision, or if the arbitration decision was not in the national interest. Uncertainty over the enforcement of arbitration decisions deters the use of arbitration, and by default may deter investment and economic growth. Domestic legislation can reduce this uncertainty by avoiding the temptation to place restrictive limits on arbitration awards, and only allowing appeal to domestic courts if compliance with the award would put the party in violation of domestic law.

4.4 Rules of corporate governance

The rules of corporate governance are important in establishing transparency in shareholder-management relationships. Both corporate governance and the procedures for exit and bankruptcy are critical for long-term access to equity and investment. This includes enforceable rules to protect minority shareholders, prevent insider deals and conflicts of interest, and ensure adequate accounting and auditing (WORLD BANK, 2002).

It could be argued that too little attention has been given to establishing efficient and credible institutions for corporate governance. In some cases, these problems can be traced back to the privatisation process that left existing directors of state enterprises or local bureaucrats in charge, effectively making these individuals residual claimants to the assets of the enterprise. This has been a particular problem in Russia. Rampant tunnelling activities resulted, including asset stripping and cash diversion. Theft and corruption are also major problems.

Effective legal protection is a prerequisite for inducing suppliers of finance to commit resources to an enterprise for a return on their investment. Specific provision for legal protection of investors and a credible regulatory system for financial intermediaries, such as investment funds, brokers and stock markets is essential (JOHNSON and SHLIEFER, 2001). If insider-ownership structures dominate, there are perverse incentives for managers to act in their own self-interest, thereby deterring outside investment.

Stock option plans are commonly used in western economies to provide managers with incentives to maximise shareholder return. The success of these plans is contingent upon an appropriate institutional structure, including an efficient capital market, fair and transparent price evaluation and accounting processes and a legal framework governing the establishment and operation of stock-option plans (OECD, 2002). Without the appropriate institutions, the introduction of stock option plans would be open to manipulation and abuse by vested interests. As such, they would likely fail as a device to align the interests of managers with outside shareholders, fail to enhance corporate performance and, ultimately, fail to encourage outside investment.

A system of credible third party *auditing* is necessary for the long-term development of efficient and sustainable capital markets and in maintaining long-term investor confidence. Manipulation of audit statements and widespread fraud can be major problems. Policy measures are necessary in the form of auditing laws to provide regulatory oversight of the auditing process to reduce the opportunities for manipulation by insider vested interests. Without these policy measures, lack of transparency will weaken shareholder confidence and deter investment.

Bankruptcy laws are also important in bringing the discipline of the market to bear on poor management, and have a direct effect on the long run availability of financing. In developed market economies, bankruptcy proceedings tend to

give first priority to secured creditors, and then to reimbursing owed salaries, tax, supplier credits, etc., leaving shareholders as the residual claimant (GRAY, 1993). In some transition countries, initial bankruptcy laws shifted the priorities in favour of salaries and severance pay for workers over secured creditors. In the long run this is likely to limit access to secured credit as a source of enterprise financing. Nevertheless, it is also important to distinguish between appropriate rules during a period of transition compared with a post-transition equilibrium. Giving suppliers who have extended credit priority in bankruptcy proceedings may be necessary as a temporary transition step, given the importance of inter-firm credit and the potential cascade effect of a bankruptcy within a fledgling supply chain. Although cushioning inter-firm credit may be applicable in the short-run, financial intermediaries are a more sustainable institution in the long run; being generally more transaction-cost efficient in terms of evaluating creditworthiness and risk.

In the aftermath of privatisation, transparent and rigorously enforced competition laws can help expose poor management to the disciplines of the marketplace. The challenge lies in designing these laws to encourage competition, without inhibiting investment. Transition economies, in particular, face unique obstacles in this regard. Enforcement of these laws and further institutional development of competition policies to establish and maintain competitive market environments are ongoing concerns (OECD, 2001).

Typically, competition laws deal with industry structure, such as the number and size distribution of firms in an industry, and firm conduct – pricing strategies, strategic creation of entry and exit barriers, etc. It is often difficult to distinguish between predatory behaviour that is contrary to the public interest and firm strategies that are a natural part of the competitive process within that the industry. In transition economies, the structure of industries formerly organised as state enterprises is largely a result of the privatisation process. Where that process led to the creation of bilateral monopoly situations, distortions inevitably arise. Strict anti-monopoly laws may inhibit investment at critical junctures of the transition process. Nevertheless, rules outlawing – and penalising – cartel behaviour are an essential component of market reforms in CEE countries.

4.5 Financial institutions

A competitive, stable and market-driven banking system plays a key role in encouraging long-term investment and economic growth. Banks, as financial intermediaries, lower the negotiation costs of doing business by facilitating payment over time and over distance. The ability to clear cheques through an integrated banking system eliminates the need for costly and risky cash-based transactions. The large amounts of cash required to finance cash-based transactions poses a security risk and raises internal monitoring costs for firms in guarding against pilfering. Inventory management is made easier by the use of delayed

payment practices that simply would not be possible in a cash-based transaction environment.

In market economies, banks are also an important source of financing for new investments. Transition countries differ markedly with respect to the importance of domestic credit. For example, in 1999-2000 in Russia, only three percent of total investment was sourced from banks. Commercial bank loans represented only 14.6 percent of Russian GDP, compared to over 20 percent of GDP in Hungary and over 40 percent in the Czech Republic (OECD, 2002).

Poorly managed firms that subsequently perform poorly, are subject to the disciplines of the market through equity and financing constraints. A competitive private commercial banking sector is a key institution in a market economy. Reforming the banking system has been a critical component of the transition process. The entry of new banks is fundamental to building a competitive banking sector in the long run. In the short run, however, rapid entry can mean a high level of bank failures and a weakening of depositor confidence in the new banking sector (WORLD BANK, 1996). This can lead to a low level of trust in the banking system, with only a very low level of deposits. For example, in Russia, bank deposits are only 6.6 % of GDP, and most of these deposits are short-term. Private deposits in Russian commercial banks are reported to cover only 6 percent of their assets, compared with 31 percent in Poland and 48 percent in the Czech Republic (OECD, 2002). A credible system of deposit insurance helps maintain depositor confidence. High transaction costs for insurance firms in evaluating the sustainability of a commercial bank, and the potential size of losses, are market failure arguments in favour of public sector provision of deposit insurance. Deposit insurance is also important in preventing widespread depositor panic and spillover effects across the banking sector in the event of a single bank failure. It is clear that policy measures to guide the invisible hand of the market are also necessary in maintaining a stable banking sector.

Nonetheless, failed banks should be allowed to exit the banking system, particularly if bank failures are a direct result of poor lending and investment decisions. Policies to ensure good corporate governance reduce information and monitoring costs for banks, thereby reducing the risk of bank failure due to information asymmetry rather than simply poor lending decisions. Regulatory oversight of the banking system is also critical in ensuring that banking failures do not destabilise the entire sector. At the same time, regulatory oversight of new banks reduces search and monitoring costs for depositors in requiring that these firms meet certain capital requirement standards. Entry by reputable foreign banks may also provide a source of capital, managerial expertise and competition, provided that foreign banks are subject to the same domestic regulatory environment as domestic banks.

5 CONCLUSIONS

Transaction cost economics provides insights into the nature of the firm and the structure of inter-firm relationships. By focusing on how and why economic transactions occur, TCE highlights the factors that encourage or impede investment and economic growth.

In the presence of uncertainty and asymmetric information, boundedly rational individuals face transaction costs in safeguarding asset specific investments against opportunistic behaviour. Investment is deterred, or may only incur within vertically integrated firms, thus placing capital constraints on long-term investments. Fundamentally, businesses dislike uncertainty; yet high levels of uncertainty characterise an economy in transition with embryonic or dysfunctional market institutions. Getting the institutional environment right is an important prerequisite to lowering transaction costs and facilitating economic growth.

Commercial contract law and effective dispute settlement mechanisms, either through the courts or through commercial arbitration processes, reduce transaction costs and facilitate the development of new supply chains. Weak corporate governance, graft and corruption will undermine investor and public confidence and pose a serious threat to economic growth and investment. Policies that enable the market to discipline poorly managed firms, while encouraging growth and investment in new enterprises are important. For the most part, this requires that policymakers in transition countries concentrate on establishing the necessary institutions that allow market forces to work, rather than interfering directly in the market.

Clearly there are many institutions that guide the invisible hand of the market, and to discuss them all is beyond the scope of this paper. Information and quality measurement institutions will become increasingly important as the agri-food sectors in CEE countries seek to respond to increasingly sophisticated consumer demands in their domestic market and in export markets. A sustainable commercial banking sector, effective contract law, close attention to corporate governance, and clear delineation and protection of property rights remain key components of the wider institutional environment. For those CEE countries belonging to the European Union, these factors will be particularly important in allowing the agri-food sector to compete within the new reality of the Common Market.

REFERENCES

- BARZEL, Y. (1982): Measurement cost and the organization of markets, *Journal of Law and Economics*, Vol. 25(1), pp. 27-48.
- BOGER, S. (2001): Quality and contractual choice: A transaction cost approach to the Polish hog market, *European Review of Agricultural Economics*, Vol. 28(3), pp. 241-261.

- CHEUNG, S. N. S. (1987): Economic organization and transaction costs, in: EATWELL, J., MILGATE, M., NEWMANN, P. (eds.): *The New Palgrave – A Dictionary of Economics* (2), Macmillan Press, London, pp. 55-57.
- CHEUNG, S. N. S. (1982): Will China go capitalist?, Institute of Economic Affairs, London.
- GRAY, C. W. (1993): Evolving legal frameworks for private sector development in Central and Eastern Europe, INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (ed.): *World Bank Discussion Papers 209*, Washington D.C.
- HANISCH, M., BECKMANN, V., BOGER, S., BREM, M. (2001): In search of the market: Lessons from analyzing agricultural transition in Central and Eastern Europe, Proceedings of the 5th Annual Conference of the International Society for New Institutional Economics "Institutions and Governance", Berkeley, California, September 2001.
- HOBBS, J. E., KERR, W. A., GAISFORD, J. D. (1997): The transformation of the agrifood system in Central and Eastern Europe and the New Independent States, CAB International, Wallingford, Oxon.
- JOHNSON, S., SHLEIFER, A. (2002): Privatization and corporate governance, paper prepared for the 12th Annual East Asian Seminar on Economics, National Bureau of Economic Research, Cambridge, Massachusetts, 281.-30.06.2002.
- KEEFER, P., KNACK, S. (2001): Boondoggles and expropriation: When are property rights secure and public investment growth-promoting?, Proceedings of the 5th Annual Conference of the International Society for New Institutional Economics "Institutions and Governance", Berkeley, California, September 2001.
- KLEIN, B., CRAWFORD, R. G., ALCHIAN, A. A. (1978): Vertical integration, Appropriable rents and the competitive contracting process, *Journal of Law and Economics*, Vol. 21(2), pp. 297-326.
- LANG, M. G. (1980): Marketing alternatives and resource allocation: Case studies of collective bargaining, *American Journal of Agricultural Economics*, Vol. 62(4), pp. 760-765.
- NUREEV, R., RUNOV, A. (2001). Russia: Whether deprivatization is inevitable? Power-property phenomenon as a path dependence problem, Proceedings of the 5th Annual Conference of the International Society for New Institutional Economics "Institutions and Governance", Berkeley, California, September 2001.
- OECD (2001): Reforming Russian infrastructure for competition and efficiency, Organisation for Economic Co-operation and Development, Paris, January 2001.
- OECD (2002): White Paper on corporate governance in Russia, Organisation for Economic Co-operation and Development, Paris, April 2002.
- RADAEV, V. (2001): Informal institutional arrangements and tax evasion in the Russian economy, Proceedings of the 5th Annual Conference of the International Society for New Institutional Economics "Institutions and Governance", Berkeley, California, September 2001.
- SIMON, H. (1961): Administrative behavior, 2nd edit., Macmillan, New York.
- WEDER, B. (2001): Institutional reform in transitions economies: How far have they come?, Proceedings of the 5th Annual Conference of the International Society for New Institutional Economics "Institutions and Governance", Berkeley, California, September 2001.
- WILLIAMSON, O. E. (1979): Transaction cost economics: The governance of contractual relations, *Journal of Law and Economics*, Vol. 22, pp. 233-262.

WORLD BANK (1996): From plan to market, World Development Report 1996, Oxford University Press, Oxford.

WORLD BANK (2002): Transition the first ten years: Analysis and lessons for Eastern Europe and the Former Soviet Union, The World Bank, Washington DC.

HOW EFFECTIVE IS THE INVISIBLE HAND ON TECHNOLOGICAL AND INSTITUTIONAL CHANGE AND THE REDUCTION OF TRANSACTION COSTS IN THE FOOD SECTOR?

*ERNST-AUGUST NUPPENAU**

ABSTRACT

This paper discusses the difficulties, in transition economies, of grounding the paradigm of the invisible hand on a balance between exclusion and governance. It argues that pure property rights are not the solution to the problem of finding optimal institutions in the food sector of transition countries. A society that is faced with high transaction costs and the modulation of benefits from rent seeking may seek a mixture of exclusion and governance. Drawing from the proposition of Henry Smith, that precision in the development of rights is the core issue of institutional and technological change, it is suggested that the transition of the food sector cannot avoid involving administrative activities that direct the change. Searching for institutions that promote adaptation to local resource and technology problems and that provide innovative solutions, an invisible hand paradigm based on pure exclusion, is considered inefficient. This view is supplemented by the findings of Saleth and Dinar, who have shown that a subjective interpretation of institutions and ideology plays a major role in promoting successful transition and technological innovation in the water sector.

Keywords: *Institution economics, governance, exclusion, transaction costs.*

* Institute of Agricultural Policy and Market Research, Justus-Liebig-University, Giessen, Germany, Email: Ernst-August Nuppenau@ agrar.uni-giessen.de.

1 INTRODUCTION

As the development of western economies, and in particular the performance of the food sector of market-oriented countries over the last century has shown, a certain trust in the mechanisms behind the invisible hand may finally result in (1) the most sophisticated modern farm technologies, (2) efficient food processing, as well as marketing industries, and (3) ever more satisfied consumers. So, why not wait and see similar things happen in transition countries? Such deliberations include open trade regimes, liberalised land markets, rural labour markets, etc., and it has been expected that private property, that is, the exclusion of rights, as well as strong competition for resources, result in positive adjustments such as: (1) an immediate increase of food production, (2) better food quality, (3) attractive new products, etc., on the product market level, but also: (4) land consolidation in the hands of efficient farmers, (5) a market-based determination of farm sizes, (6) immediate integration of labour forces in new farm structures, (7) investments in modern equipment, etc., on the input markets. However, these expectations and perceptions mean that the invisible hand and price mechanism is a generic device to generate welfare, that no further governance is needed, and that no exceptions to the functioning of that mechanism exist. The only policy advice which then remains is the rapid assurance of private ownership and a sequencing of reform that builds on property rights and individualisation (though admittedly, in reality it is more complicated: LERMAN et al., 2004). In contrast to that vision, one could argue that the success in some countries, so far, have been an exception, that transition needs more time, and, given the conditions in CEE Countries, that it cannot be directly carried over from the West to the East.

In this context, at least, it is understandable that policy makers in transition countries seek access to similar standards of market performance, also on input markets, as were prevalent in the old EU and that they want to know the "right" and immediate recipe for replicating success. But can we see the invisible hand as a recipe, and does it work without any other ingredients? At this point, perhaps, we should go into a deeper analysis of causalities (1) to make the invisible hand function, (2) to look at market interactions and failures, (3) to appreciate other, complementary, institutional arrangements that may bring about the positive change strived for, and (4) to reconsider policy as the governance of change. To enable the successful operation of a modern food sector, necessary and sufficient conditions are, perhaps, needed that assure market development, and it cannot be assumed that the development for market coordination of economic plans can be taken for granted. This is even more so if the prerequisite for the workings of the invisible hand, the setting of rights, is not automatic. In particular, an approach to the determinants of changes towards appropriate technologies in resource use and favourable institutions in the food sector, such as responding to the needs of landowners and labourers, is required. It is the objective of this paper to look at complementary institutional aspects (1) to improve,

i.e., reduce transaction costs, (2) to obtain new transaction arrangements in food production, and (3) to encourage investments. The analysis studies impediments to and searches for core elements of making the invisible hand function better; not to substitute it, but rather to supplement it with governance.

The paper draws on the contribution of Henry E. Smith in "Exclusion versus Governance: Two Strategies for Delineating Property Rights" (SMITH, 2002), published in a special issue of the "Journal of Legal Studies" on the evolution of property rights, which will be reviewed first. This review will highlight the current situation in the CEECs regarding institutional change and property rights. The paper then applies Smith's suggested framework to the problem of technological and institutional change in the food sector of transition countries. As opposed to the initial "Demsetz" hypothesis (DEMSETZ, 1967), which states that the rule of law is the core and that institutional change emerges as a matter of supply and demand for institutions (DEMSETZ, 2002), Henry Smith theorises that governance is at the centre and that we cannot trust ourselves in a simple 'supply and demand' of institutions. Smith states that private property rights, such as the exclusion right, are not always the best institutions. Rather, he sees a spectrum of institutions where governance is on the one side of the angle and pure private property is on the other side. Thus, institutional change is a consequence of cause and effects as well as the interaction of private property and governance. This view implies that governance or "good governance", as normatively phrased, has a stake in the performance of markets and institutional change. Governance in this context means, for instance, that a public authority (1) guarantees standards, (2) seeks the fulfilment of contracts, (3) contemplates the planning of farm structures, and (4) provides a platform for land and labour arrangements; basically it becomes involved. A government can (5) decide on settlement patterns, (6) may control land transfer and regional land prices, and (7) limit competition. To make the paper more than just theoretical, the role of governance and the involvement of public organisations are further elaborated by using evidence from institutional change in the water sector (SALETH and DINAR, 2004). Saleth and Dinar argue that the policy formation for common pool property resources such as land and water, which are typical for the food sector, needs a profound interaction of private entities, administrations, and the policy-making sector. Their findings will help us to make Smith's arguments more grounded on empirical evidence from the transition of rights.

The paper is organised according to the sequence of (1) theoretical background, (2) the supplementation of evidence from a complementary field, (3) the detection of deficits in the food sector of transition countries, (4) suggestions for improvement, and, finally, (5) some practical remarks. Further, it (6) provides an outline of Henry Smith's arguments, (7) reviews Saleth and Dinar's findings, (8) sheds some light on the complementary detection of institutional and political problems using Smith's new paradigm, and (9) analyses how far the frameworks

of Smith, Saleth and Dinar can be applied to the mitigation of the current transition problems in the agro-food sector of transition CEE countries, especially with respect to questions of framing institutions for landownership and labour regulations. We (10) will discuss what institutional arrangements, besides the operation of the invisible hand, can be practically derived from the analysis of Smith, for instance, for the better functioning of land and labour allocation in a vacuum of no government interference. Note that during the discussion we perceive the better functioning of resource allocation as a dynamic concept that includes innovation in technologies and institutions. This will become clearer when we go into the historical components of Smith's arguments for land development, productivity increase, and ownership regulations.

2 THE THEORETICAL BACKGROUND

Initially, we should apply a broad analysis, including an additional transaction cost approach, of what is involved in the transition process itself (ANDERSON and HILL, 1975). To make it clear, we have to distinguish between three layers of transaction costs: (1) Direct transaction costs appearing in food production and the allocation of resources to produce food (including information, marketing, and retailing costs). (2) Indirect transaction costs, such as the guarantee of contract fulfilment, the supervision of property, hindering others from reaping benefits from private investments, etc., involved in getting long-term commitments from property owners. These costs are broadly recognised as either exclusion or governance costs. (3) Special transaction costs appearing if changes of the system are envisaged (such as the new demarcation of property, a vision of those who lose collective benefits, the preparedness of using force to sustain property, of forming group trust, etc.). These costs especially occur in turbulent periods of rapid social change and may prohibit the invisible hand from fully functioning. Not functioning fully means, in the meta-sense of a market for institutional change, that the supply side does not meet the optimal demand for new institutions. Rules on where and what to deliver in terms of labour, inputs, etc., are not supplied. Note that further transaction costs cannot immediately be translated into price signals (i.e., marginal costs equals price), even if it is known who bears the costs.

It cannot be expected that price signals alone encourage entrepreneurs to alter the modes of transactions and to come up with technological innovations designed to set up better rules of conduct. To give an example of technologies and regulations needed if privatisation in a community of potential farmers is to work, let us shortly imagine all the problems emerging from land re-distribution. Land distribution, besides raising important questions like restitutions versus vouchers, restructuring versus whole farm privatisation, etc., on the global level (LERMAN et al., 2004), cannot avoid going into details and problems given on

local levels. It should work on local conditions involving methods that are provided through: (1) a possible cadastral delineation of land parcels, which is a problem in itself due to questions such as: Which parcel, what size, what landmarks, etc., are institution and technology driven; (2) means of property assurance which are not self-evident, since questions about fencing, the quality of security guards (if needed), remote sensing, etc., are also perhaps due to innovations; and (3) means of agreeing on communication in disputes and conflicts, which are normal even in seemingly well-established right systems.

Note that some of the technologies and institutions needed for private ownership are, perhaps, for most of us taken for granted. Not at all do we infer that transaction costs are system and technology dependent. For those who have had problems with their neighbours about noise and overhanging trees in their gardens, problems might be more understandable than for those who live in isolated apartment houses. As will be further outlined below, technologies for excluding others, which is basically considered a right, have different costs in different environments. For instance, countries that have vast tracks of land will have high costs in establishing fences, while collective grazing arrangements are cheaper to enforce. The question emerges: How or by what technology is the control of animals and people achieved? There is a need to think about institutions as a spectrum ranging from full property rights (exclusion) to public affairs (governance) which have to be settled by policy. Such a spectrum reveals the need for individual and public coordination to assure the function of (input) markets (SMITH, 2002).

2.1 The generic argument of Henry Smith

Henry Smith starts his arguments with the common sense proposition that, "...exclusive property rights is said to help solve the 'tragedy of the commons'" (SMITH, 2002, p. S453). He also cites Demsetz by phrasing, "... 'property rights' are said to develop in response to changes in the cost and benefits of internalising potential externalities" (ibid.). But then he takes a broader view and includes "definition and enforcement" costs. From a methodological point, Smith suggests a complex view on rights by seeing them as a continuum between purely exclusive, i.e., private rights (for instance defined as 1 or 100 % private) on the one hand, and collective, public, i.e., governmental rights on the other (defined as 0 or 0 % private). Note the definition of governmental rights interfering in private rights, i.e., the reduced functioning of the invisible hand, is mirrored. If public rights expand, private rights diminish and vice versa. Having many rights, for instance in the daily operation of life, humans work with a knowledge of different types of control over their actions and judge the level of governance interfering in them. Smith cites the example of grazing rights to make the case perceivable: He suggests that using a commons for grazing is in the middle of the spectrum between private (exclusion) and public rights (governance). Herders

can graze and have private rights on animals, but grazing is controlled by the number of animals, by the time to graze, by access to individual pastures, etc. The reason is that the costs of exclusion may sometimes be too high to assign pure private rights on pastures; imagine a pastoralist fencing sparsely grazed areas. But this is only half of the argument. Also, including risk aspects and insurance for survival can be considered implicit costs (RUNGE, 1981) of exclusion. For instance, rain may be scattered and only collective action assures a livelihood for the individual. Benefit functions from exclusion are frequently not purely individual, though strong individuals in a group sometimes think they could survive without neighbours.

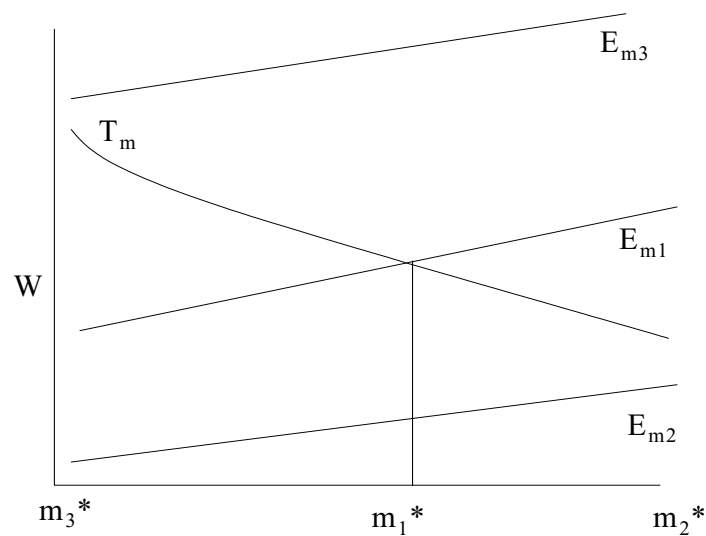
Smith then posits that under certain conditions, individual property can even be dismantled and substituted by increased elements of common property. He does not see the emergence of private property as unidirectional; as happened in medieval England for ecological reasons, private land ownership was converted into commons. A major argument is that land ownership can start with pure individual property rights and, due to a population increase and resource degradation, common property management becomes important. For instance, as an innovation and technology change, a collective rotation system emerged in Europe. Smith attributes the subsequent enclosure of the sixteenth and seventeenth century to rising wool prices and the intensification of sheep production.

However, these are examples and we have (1) to generalize the problem of the choice and dynamics of institutions, and (2) to apply it to some findings related to the current situation of the functioning or non-functioning of the invisible hand in transition economies. In particular, we have to understand the theory of institutional change in the food sector more deeply. In this respect, Smith makes it very clear (*ibid.*, p. 463) that some externalities are not worth being internalised due to the high costs of internalisation. This also applies to the third level: Transition. In other words, on a meta-level, marginal costs of internalisation and marginal benefits should match and, at least theoretically, ill-defined private property rights result. For a set of full arguments, please follow arguments on incursion and exclusion costs, (*ibid.*, p. S464) as well as exclusion and governance along the organisational dimension (*ibid.*, p. S467). Smith's arguments show that, additionally, the dimension of property is not always easy to define. Especially if land is the property to be traded and the invisible hand has to work on land, a misperception may occur relating to what is to be governed. From an ecological point of view, sustaining land quality as a function of providing food and directing property rights to functions and not to physical trade, it is difficult to view land as a collateral or property for serving capital accumulation and trading purposes.

2.2 The exclusion cost argument of Henry Smith

Acknowledging, according to Smith, that the prerequisite for the pure operation of the invisible hand for economic co-ordination are pure private property rights, we have to appreciate (1) that it would make no economic sense to simply rely on the invisible hand if rights enforcement is too expensive. We would do better to envision (2) that a complementary choice between government interference and market coordination exists, dependent on transaction costs. The correct degree of interference, again, can be expressed artificially as a percentage between no interference (pure invisible hand) and complete government control (pure command economy). The observation that institutional choice depends on the marginal costs and benefits of the definition and the enforcement of rights opens up the question of dimensions which reveal a basis for calculating the costs and benefits of exclusion. For the dimensional problem, Smith suggests that (1) the "cost" of exclusion and (2) a "precision" of rights approach should be combined (ibid., S471ff.). Admittedly, it is difficult to determine the respective marginal cost and benefit functions for unknown dimensions of rights. Nevertheless, we have to acknowledge that there is a need for a precise definition of rights on a perceivable dimension and to make the dimension operational. In Smith's view, precision opens a venue for seeing institutional and technological innovations as if precision increases and costs diminish simultaneously. Only then does the food sector move towards more sophisticated rules of resource allocation.

For the moment, we have to continue with the argument of Smith, who considers changes in exclusion costs as a driving force for institutional change first, and benefits, second. Figure 1, which is adopted from Smith, provides the arguments graphically. Smith himself borrows from a model of Field (quote ibid, p. S465) in which the number of commons is to be determined and savings in transaction costs are benefits. To understand the model building, one should start with the presumption that the low precision of institutional design is what humans face in the beginning when they organise societies (origin in Figure 1). At this origin, we have a large, though merely one, common with N users. Because of the low cost of handling an "imprecise" common, its definition is primitive. As we move from the origin to the right, the size of the common decreases, the number of commons increases and also the precision of definition (finally towards private property, now defined as an ultimate small single common in terms of transaction costs). The general message is: The more commons, the more detailed the management. However, T_m shows the marginal benefits of enforcement of the common (m_1^* is the size of the government) intersecting the marginal costs. E_m represents the marginal costs of exclusion (Smith calls it boundary management and it increases with more private property). E_m as E_{m3} can lie outside the range of T_m . For that we have corner solutions.

Figure 1: Efficient number of commons

Source: SMITH, 2002.

An optimal degree of commons can be translated into precision and a detailed definition of resource use. A definition of rights, for instance, can mean land parcelisation, functional rights, etc.. Note that graphically, the optimal m_1^* is given for a static intersection of E_{m1} and T_m . A question is why is E_m changing? Smith argues that it makes no sense to distinguish between exclusion and governance (p. S467). And, so far, the costs and benefits have not been assigned to entities.

2.3 The precision argument of Henry Smith

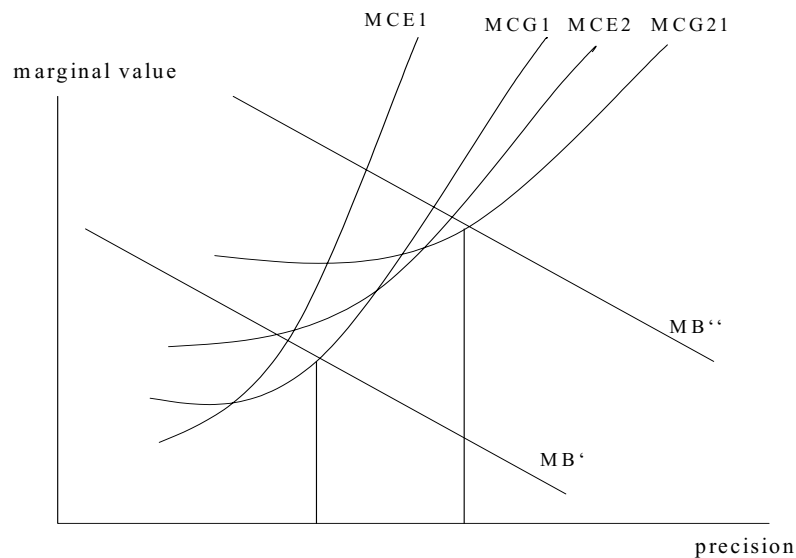
I would argue even further, that we have to add a subjective component to the determination of the marginal cost curve of exclusion (see below, taking the view of Saleth and Dinar). To continue here with Smith's exclusion and governance approach, two poles in a spectrum of rules occur. Exclusion is an activity used to concentrate the benefits from investment and specialisation in the hand of a private beneficiary. So we have to define entities of beneficiaries and cost takers. The benefits depend on the attributes of the property. If they are difficult to measure, no market for exclusion service will appear. Exclusion costs relate to governance and governments. To clarify the point with an example: A cow's mouthful of grass should be the ultimate measure of using a common. But normally one can only charge for the number of animals that graze. To inspect mouths is too costly. We cannot even measure the grass in the mouth precisely. The easiest way is to measure land and fix boundaries. Then access is controlled. Now the understanding of functional (performance) versus property (objective related) rights matters. Governance does not only mean controlling access, rather it means allowing different users holding different types of access in accordance with a cost-benefit or damage-versus-food calculus. "Governance, in contrast, consists of a set of norms picking out important uses use of the asset."

..."A question, at hand, is, how precise can the rules be set? "...all input and output rules depend on proxy measurement, and the cost of rules will depend in part on ease of substitution along various margins and the costs of measuring those margins."(ibid., p. 471). Additionally, costs are shared by the community.

To reflect for a moment, in transition economics one can presume that it is difficult to set very precise rules. Rather, proxies have to be easily understood, visible, and have minimal control and coercion costs. This means that the prerequisite for the working of the pure invisible hand is precision; a full definition of property rights is not possible; or at least costs are fairly high. So it is understandable that governance will avoid the full specification of rights and will look for other means to assure their social function of "good" governance. However, the precision of rights is the issue and a wrong question is will an administration or a market do a better job? Rather, both should work together.

Smith sees the jumps between different technologies (costs) of exclusion as related to the precision of defining rights in a society and he introduces costs of governance as related to the precision of the need to reign in a society. For this he provides Figure 2 (copied from ibid., Figure 4, p. S476). With different downward sloping marginal benefits of exclusion, we have multiple solutions. Though an immediate question is who is shifting marginal benefits (MB), one can conclude that in the dynamics of institutional choices it makes sense not to fully develop property rights in the mode of exclusion rights. Rather, it makes sense to tolerate invaders and let property rights be imprecise (governance, ibid., p. S475 and see where MCG1 and MCG2 curves intersect the MB curves in Figure 2). "Servitudes and Covenants" (ibid., p. S476) are solutions that fit in the marginal costs curves for governance and exclusion on the one hand, and marginal benefits for both types of ruling on the other.

As a major hypothesis, Smith states that the marginal costs for setting property rights may increase rapidly, while the marginal costs of governance may increase less rapidly if an increase in the precision of the operation of an economy is required. Here, as a first criticism against Smith's argument, one can state that the alternative "governance" is not clearly defined; defining governance tools takes time. So it is difficult to derive the marginal cost and benefit functions of increased precision in societal coordination as related to a time frame.

Figure 2: Exclusion and governance

Source: SMITH, 2002.

In this regard, a more concrete hint for what is meant by governance can be still retrieved from examples given by Smith. For instance, he states that "boundary configurations and governance are substitute methods of controlling strategic behaviour: 'Peasants with private ownership of unfenced strips for grain growing had to throw open those strips for communal grazing.' ... 'The existence of both regimes would give commoners an incentive to strategically appropriate benefits (manure) and dump costs (trampling) on the basis of who owned what in the period of private use. ... I have called a semicommons" (ibid., p. S480). To add on common regimes, common management is visible (as opposed to the invisible hand paradigm); i.e., common pool property management is achieved by a visible hand. "Scattering of strips in a system of temporarily interleaved rights functioned like governance rules that prescribed proper grazing." ... "scattering became more precise over course of open field periods." (ibid., p. S480-S481).

Maybe this is history. But it shows the need for precision. Note again in this context that the move from individual resource exploitation to the common property management of soils can be considered an innovation to maintaining soil fertility. Manure application for maintaining soil fertility is not a technology that has been developed by an institution based on the invisible hand. The invisible hand implies the trading of land between individuals, soil exploitation, and setting prices for more or less fertile soils based on asymmetric information. It can be put forward that innovation comes as a collective action and the governance of commons can be considered as an institutional framework conducive for innovations. For this, Smith again cites other findings, for instance from Maitland that "... in sum, the simple traditional story of a universal trend from communal to private tenure ... is untenable. ... the broad trend was ... from vague to definite" (ibid., p. S483). This phrasing may allow us to think more

about institutions that promote land intensification in particular, promote the food sector in general, and fit into the framework of transition.

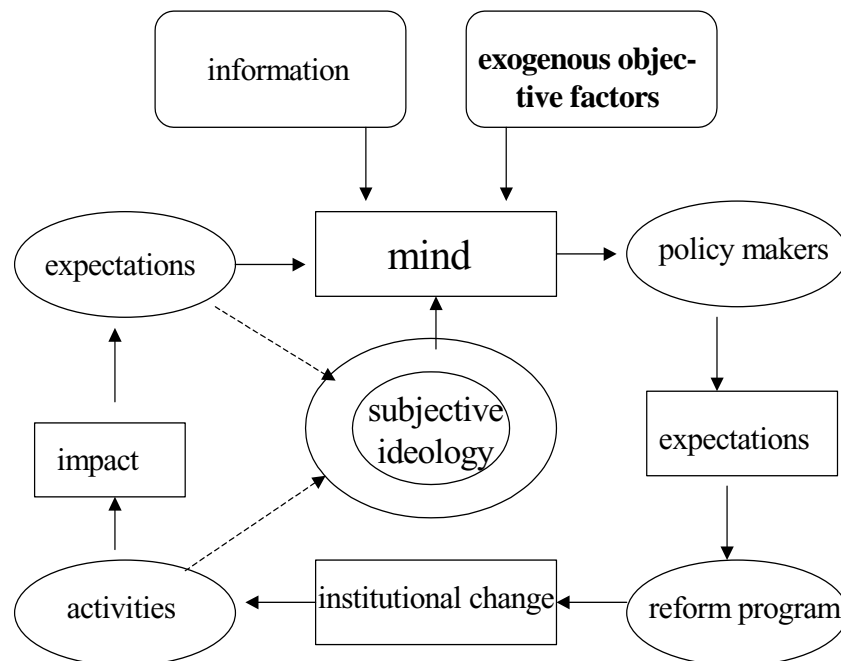
3 OUTLINE OF THE ARGUMENT OF SALETH AND DINAR

In their chapter on "Evaluating institutional linkages: Toward an alternative methodology" in the book, "The Institutional Economics of Water," SALETH and DINAR (2004) introduce a "subjective theory of institutional change". This theory very much relates to the question of how institutions can emerge that better fit into the social and economic framework of transition. Saleth and Kinar object to the strategy of prescribing a single matched institution, such as given by the trinity of "private property, exclusion rights, and the invisible hand". Also, in their opinion, as devices used for an institutional economic foundation of exchange activities in a society where natural resources are strongly involved, humans should better match governance and exclusion. Looking at the complex interaction of governance structures and exclusion rights, as has just been portrayed, a spectrum between pure governance and pure exclusion is also preferred in their book. Specifically, the authors ask how institutional change that brings about the most appropriate set of governance (including exclusion, as a partial device only) can emerge. Reckoning the dynamics of institutional change, we could imagine that an evolutionary process, with a certain directional guide, is needed. Saleth and Dinar explicitly consider the process of institutional change as a process constituted of several stages and instituted by a duality between individual and collective rights and knowledge and rationality. Their central hypothesis is that individuals are the promoters of change. But individuals rely on perceptions and, to promote change, they conduct cost-benefit analyses for their behaviour. A "subjective perception" is important throughout the process of institutional change" (ibid., p. 83). In the vein of Smith's above argument, the marginal benefits of exclusion and governance depend, to a large extent, on subjective notions. It is important to know what is meant by benefits and costs, and how one can increase the likelihoods that benefits accrue to individuals. A probability assessment is needed to make the arguments of Smith applicable.

Again, basically, Saleth and Dinar have a broader view than the invisible hand paradigm suggests. By a cycle, depicted in Figure 3, they portray crucial elements of a subjective theory of institutional change. Innovations in technologies that manage natural resources in agriculture such as soil, water, pastures, etc., institutions play the crucial role of governance structure. Starting with the deficits of the market, i.e., the invisible hand and its prerequisite, the exclusion mechanism, Saleth and Dinar state that market failures are so frequent that organisational structures have emerged that overcome information asymmetry, knowledge scarcity, transaction costs and lack of coercion (ibid., p. 88). Their institution decomposition analysis, IDA, is a multidisciplinary approach.

(1) IDA provides a typology of institutional choices. For the performance of institutions, a decomposition means that laws regulating resource use, policies governing resource users, and administrations controlling and interacting are identified and screened. (2) At the end of a detailed discussion, Saleth and Dinar posit that, "While a (water-) rights system is a means for improving sector performance, it is also an end from the standpoint of institution building. ...the cause-effect categorization is path dependent in the sense that a 'cause' can be an 'effect' and vice versa depending upon the objective of the evaluation and the route through ... evaluation proceeds" (ibid., p. 145).

Figure 3: Cycles and the subjective theory of institutional change



Source: SALETH and DINAR, 2004.

What does this mean for the question of institutions that shall foster the process of finding and developing technologies that fit in the framework of transition countries, and why is it worthwhile to study the transition of water rights in regard to the transition of the food sector in CEECs? (1) We have to reconsider that institutional change is an equilibrium between marginal transaction costs and marginal benefits. Marginal benefits are actually opportunity costs which appear, for instance, if the system further deteriorates. (2) One can, at least theoretically, expect a market solution where marginal costs and benefits intersect in the tradition of having a market for transition determining the speed of change. (3) But the invisible hand does not direct the speed. Rather, as has been identified by Saleth and Dinar: "Variation ... of institutional reform ... provide evidence for the powerful effects that factors both endogenous and exogenous to the (water) sector have on the opportunity and transaction costs of institutional change. These factors act together to raise the opportunity costs of institutional change, reduce the corresponding transaction costs, and create a pro-reform plat-

form" (ibid., p. 184). "... a strategy also affords a political economy advantage..." (ibid., p. 185). Evidence is "... policy-related channels have a larger impact than the law-related channels ..." (ibid., p. 275) and "... administration related channels are more important than other channels ..." (ibid., p. 293).

By summarizing and transferring the experiences of Saleth and Dinar in the transition of institutions in the water sector to our question of transition of the food sector in general, we have to keep in mind how many problems are related to natural resource use and the precision of rights definition. From the detailed writing of Saleth and Dinar, it becomes understandable that the precision of governance is related to the capacity of an administration to manage resources and to the endeavour of achieving higher precision in setting advanced rules and tasks. This finding supports Smith's hypothesis that institutional change is not unilateral and a balance between exclusion and governance is important. To create the balance, subjective elements of mind-setting and ideology questions emerge that cannot be overlooked. Importantly, Saleth and Dinar add subjective elements to Smith's more objective theory. This means that the "ideology" of the "invisible hand", as opposed to the "common pool" paradigm, can play a role in hampering transition. Being pertinent to the administration, "ideologies" play a major role in creating an atmosphere that is conducive to better economic performance, including necessary incentives for technological change. Cost saving, competitiveness, etc., are one side of the coin. Sustaining resource bases and creating livelihoods for a majority of those living from agriculture is the other side. In the next section we will further discuss what the above arguments could mean for the praxis of institutional change in transition.

4 IMPLICATIONS AND DISCUSSION OF APPLICABILITY

4.1 Integration of observations from the first period of transition

The above discussion has several implications for the debate of the functioning of the invisible hand in the transition of the farm and food sector of CEECs. However, (1) we have to further acknowledge that empirical evidence (MACOURS and SWINNEN, 2000) shows that privatisation has resulted in production decline and, even more pronounced, in yield decline. (2) Transition does not seem to be as smooth as it was expected. Indicators can also be misleading. Increases of labour productivity, for instance, mostly observable in large scale farm operations after privatisation, can also be considered as part of the problem. Because it reveals that less productive labour does get work and produces food on large farms, the pure recognition of labour productivity as a success is misleading. Attributing the aspect of labour primarily to the observation that unproductive labour has left the agricultural sector as a consequence of the specific functioning of the invisible hand, we have to be careful when judging the quality of that institutional framing.

Having high unemployment in both rural and urban areas of transition countries, it is an indicator that markets do not match supply and demand. (3) Also, the adoption of technologies imported from Western countries, primarily on large farms, does not seem to match with scarcities. There seems to be a problem with the institutional set-up that accompanies privatisation and the search for markets and technologies, including input and innovation markets.

However, it should be noted in this context that the author is not against private ownership, rather a more specific view on land and labour relationships, as above portrayed, might have brought out different results with respect to unemployment, land productivity, food supply, innovations and distribution. As it is the major hypothesis of this paper, a joint exercise of governance and exclusion on land and labour "markets" may have given and, perhaps, will give, "better" results. The performance of the agricultural sector in many transition countries, at the moment, might be hampered by overly vague institutional reforms. It is also not the intention to criticize what has been achieved (LERMAN and CSAKI, 2004), but rather to inspire thoughts to do better in the future. In particular, the question is how to facilitate a governance structure that allows a more precise definition of rights in the process of institutional change.

4.2 Current problems and suggestions

So again, what are the institutional problems that the agricultural sector now faces? (1) Privatisation, restitution and land transactions should have meant that pricing for land would occur and, naively speaking, "land moved to the best tiller, i.e., efficient", and very rapidly. But, in almost all transition countries, land markets and frequent transactions are rarely observable. Rather, farmers stick to collective forms of farming, and even remain in large cooperative farms (LERMAN and CSAKI, 2004, p. 123, pdf-version). This is not only true for countries where transition was slow, but also for the rapidly privatised countries which face similar situations of inactive land markets and low technical efficiency (*ibid.*, p. 130). (2) A vague problem and a hypothesis still to be researched is who are those potentially capable and willing to start farming? Can the invisible hand decide that or can governance help? Based on the scope of developing land transactions and providing farmers with necessary resources (young persons), do we have precise instruments to judge future performance? Access to land may be a far away vision for some people, especially if privatisation is a large-scale operation. So in agriculture, those that remain are either workers or entrepreneurs, but maybe not peasants.

There are incidences of successful restructuring, especially in many new EU countries. For instance, profiting from price increases and technological advances, some farmers in Poland think that they can gain from big investments in meat production. Nevertheless, there are concerns in the same country (CYGLICKI, 2004) that only few farmers gain and a duality is emerging; not to mention a

replication of all the environmental problems that emerged with specialised, large-scale farming in Western countries. The gains may be only temporary and more fundamental long-lasting questions are not solved, even with respect to the path dependency of modernisation and income expectations.

But the invisible hand is blind to such developments. In particular, (1) the emerging concern of what is an appropriate farm structure for transition countries (duality of large- and small-scale or, generally, more medium-sized) (SARRIS et al., 1999), (2) the question of who needs land, and (3) the emerging problem of duality between regions reveal that most rural areas are in disarray (disfavoured). Few areas receive investment (hot spots) and there are indicators that the functioning of the invisible hand results in imbalance. Imbalances are, per se, not a problem if they are transitory, but are they?

At the end of all those problems, the problem of optimal food pricing through markets in developing agriculture (Cheap food for consumers?, TIMMER, 1995) is not completely solved by the invisible hand. It is very dangerous to consider institutional aspects purely as a functioning of the invisible hand for the sake of cheap food for the urban sector. The exclusion of considerable populations from the access to land may result in large food problems in phases of crisis. Notably, the household food self-sufficiency system (YEFIMOW, 2003) that is still prevalent in many countries of the former USSR, is part of governance, and might expand. To see the invisible hand merely under the current conditions of cheap food at world market pricing is too narrow. Alternative scenarios have to be build around: (1) seeing institutional reforms under the imperative of establishing structures that are flexible enough in the long run to cope with different scarcities and development paths of societies; (2) questioning the relative importance of industrialisation, resource extraction industries, settlement patterns, demographics, etc.; (3) thinking about institutional set-ups that allow smooth adjustments and most importantly the build-up of social capital (PETRO, 2001), also in rural areas; and (4) coping with a changing agriculture environment. For this, the right mixture of precision has to be anticipated and permanently developed. Requiring precision in governance is a dynamic task and perhaps, as will be finally outlined, needs a different type of collective action, such as participatory planning. Planning or laying down definitions for property rights in land use are related issues. Here I see possibility for returning to the planning of pre-socialist times (Stolypin reform, at least, in Russia) which has already been an approach that envisaged governance by searching for the precision of correct definitions.

4.3 Past experiences to be adapted (the Stolypin reform)

When looking at the most backward transition countries in terms of a reform process that brings exclusion rights and ownership, the CIS countries, perhaps even a utopian input in ideology as the second phase of the Stolypin land reform (PALLOT, 2000) may matter. We should acknowledge that remembrance for such

mixed types of exclusion and governance is partly well-established in CIS countries (MACEY, 2002), and has perhaps been too abruptly abandoned. A question at hand is why not plan with field strips rather than consolidated land? A modern version of the design of villages and peasant farms may have resulted (still could result) in providing the input for changing the marginal transaction costs and the marginal benefits for exclusion as has been outlined above. Admittedly, a more detailed discussion of the designing and setting up of the plan needs a paper of its own. Here, I can merely further elaborate on transferring the abstract deliberations of an institutional economist, such as Smith, into a more operational problem as was foreseen by the protagonists of the Stolypin reform. To make the ideas of Smith applicable, one has to outline a range of things, from the request to endeavour more precise options to manage resources, notably with a wide range of property rights specified around the use of resources, to immediate opportunities for initiating a governance approach.

Looking, additionally, at the obstacles to reform (PALLOT, 2000, p. 281), one immediately recognises that the issue of a full enclosure or a partial definition of rights, as well as of fixed or flexible "planning" already appeared around the year 1900. Further major issues, best expressed in the modern vocabulary of institutional economics, are: How (1) to reach the participation of farmers, how (2) to go about a defection of enclosures, what pattern (3) to use (strips or blocs), etc. However, ground plans (*ibid.*, p. 286) seem to be the measures that enable precision and hopefully create incentives to look for individual and collective innovations for local food producing units. As a remark to those who perhaps intuitively react by thinking that the design of villages is old fashioned, please notice that modern, more flexible technologies of planning have decreased, at least, as part of incurring the transaction costs of drawing plans, envisioning the consequences of land redistribution, consolidation, etc. Farms need not be chess board-like as in the American Midwest, and rights can be better controlled today. To govern local affairs on land, experimental forms have to be envisaged. A difficulty is that knowledge of food production is either confined to the large-scale operation or to the household subsidiary food producer. Medium-sized technologies must evolve locally and the issue of the division of labour is unclear.

5 CONCLUSION

A certain precision in the planning of land use seems to be necessary to achieve the more flexible allocation of land to potential beneficiaries of land reforms and starting a process of collective action and social capital building. The discussion of a renaissance of the Stolypin ideas of land planning should be seen against the difficulties with a pure definition of rights through exclusion rights and a definition through governance (SMITH, 2002). In particular, this task is given to empirical research. However, a consequence is that governments take an active role

in, and the responsibility for transition. For a scientific approach to accommodating the need for an increased precision of rights, as has been the result of marginal costs and benefits of exclusion necessary for technological change, we can only conduct experiments of feasible land use planning and document the social processes. To develop more precise allocation mechanisms through "governance" and "exclusion" in a normative approach to policy advice, one can go along the mode for regional outlets, that of governing the process of establishing social units that control resources.

REFERENCES

- ANDERSON, T. L., HILL, P. J. (1975): The evolution of property rights: A study of the American West, *Journal of Law and Economics*, Vol. 18, pp. 163, 170.
- CYGLICKI, R. (2004): Who is squeezing Polish farmers? The EBRD's involvement in promoting big agribusiness, Polish Green Network, <http://www.bankwatch.org/publications/issue_papers/2004/ebrdagm/smithfield.htm>.
- DEMSETZ, H. (2002): Toward a theory of property rights II. The competition between private and collective ownership, *American Economic Review*, Vol. 57, *Papers and Proceedings*, pp. S653-673.
- LERMAN, Z., CSAKI, C., FEDER, G. (2004): Agriculture in transition: Land policies and evolving farm structures in Post Soviet Countries. Rural economies in transition, The World Bank, Washington.
- MACEY, D. J. (2002): Russian agrarian reform in Russian historical perspective, in: O'BRIEN, D. J., WEGREN S. K.(eds.): Rural Reform in Post-Soviet Russia, Woodrow Wilson Press and the Johns Hopkins Press, Washington, D.C., Baltimore, pp. 178-202.
- MACOUR, K., SWINNEN, J. (2000): Causes of output decline in economic transition: The case of Central and Eastern Europe, *Journal of Comparative Economics*, Vol. 28, pp. 172-206.
- PALLOT, J. (2000): Imaging the rationale landscape in late imperial Russia, *Journal of Historical Geographie*, Vol. 26, 2, pp. 273-291.
- PETRO, N. N. (2001): Creating social capital in Russia: The Novgorod Model, *World Development*, Vol. 29, No. 2, pp. 229-244.
- RUNGE, C. F. (1981): Institutions and common property externalities: The assurance problem in economic development, Ph.D thesis WI., University of Wisconsin.
- SALETH, R. M., DINAR, A. (2004): The institutional economics of Water: A cross-country analysis of institutions and performance, E. Elgar Press, Cheltenham.
- SARRIS, A., DOUCHA, T., MATHIJS, E. (1999): Agricultural restructuring in Central and Eastern Europe: Implications for competitiveness and rural development, *European Review of Agricultural Economics*, Vol. 26, No. 3, pp. 305-329.
- SMITH, H. (2002): Exclusion versus governance: Two strategies for delineating property Rights, *Journal of Legal Studies*, Vol. 31, No. 2, pp. S453-487.
- TIMMER, C. P. (1995): Getting agriculture moving: Do markets provide the right signals?, *Food Policy*, Vol. 20, Issue 5, pp. 455-472.

YEFIMOV, V. (2003): Agrarian reform and subsistence agriculture in Russia, in: ABELE, S., FROHBERG, K. (eds.): Subsistence Agriculture in Central and Eastern Europe: How to break the vicious cycle?, *Studies on the Agricultural and Food Sector in Central and Eastern Europe*, Vol. 22, Bergen/Dumme, pp. 161-178.

**ANALYTICAL APPROACHES FOR MEASURING
MARKET EFFICIENCY**

HOW EFFECTIVE IS THE VISIBLE HAND OF THE GOVERNMENT IN STABILISING THE WHEAT AND FLOUR PRICE RELATION IN UKRAINE?

BERNHARD BRÜMMER, SERGIY ZORYA¹

ABSTRACT

The analysis of price transmission between raw and processed agricultural products on their way from plan to market in transition countries is complicated by frequently changing conditions and still pervasive policy interventions. We utilise a Markov-switching vector error correction model to allow for multiple regime shifts in the price relationship between wheat and wheat flour in Ukraine from June 2000 to November 2004. The analysis reveals four regimes. The observed temporal pattern of these regimes can be matched with certain political and economic events in Ukraine. In particular, we find a strong link between the ‘high uncertainty’ regime and discretionary policy interventions in 2003.

Keywords: Markov-switching vector error correction model, vertical price transmission, regime shifts, grain policies, Ukraine.

1 INTRODUCTION

Prices play an extraordinary role in a market economy, allowing the decisions of producers and consumers to be coordinated, and allocating scarce resources in the most efficient way. Transition from planned to market economies in the post-Soviet countries has induced price liberalisation, which not only improves resource allocation, but also leads to higher price volatility in comparison with administratively fixed prices. This is especially true for farm prices characterised by relatively high volatility due to a number of reasons, among which seasonality, weather effects, inelastic demand and supply of agricultural products are the most

¹ Institute for Agricultural Economics, Georg-August University of Göttingen, Germany, Email: bbruemm@gwdg.de and szorya@gwdg.de.

important. Policy-makers often intervene in the markets in an attempt to reduce price volatility.

In Ukraine, for example, policy-makers actively intervene in the price formation of wheat and wheat products. In recent years, the price relationship on the wheat and wheat/flour markets in Ukraine has been affected by many shocks. These shocks mainly originated from the wheat side and were not only of a market, but also a political nature. Since the relatively outdated farm technologies in Ukraine lead to a high sensitivity of agricultural production to climatic conditions, the weather greatly contributed to shifting Ukraine from the position of a net exporter (in 2001, 2002 and 2004) to a net importer (in 2000 and 2003) of wheat (see Figures 1 and 2). These shifts negatively affected not only wheat producers, but also wheat processors, traders, and certainly consumers due to increased price and margin fluctuations. In order to 'neutralise' these market failures, the policy-makers introduced many interventions which aimed to

sustain the myth that "people can fine-tune markets" (VON CRAMON-TAUBADEL, 2004, p. 185). They certainly changed the path of vertical price relationship and increased the uncertainty in the market.

We aim to study the vertical price transmission between wheat and wheat flour in Ukraine from 2000-2004, and the effects of policy changes on this transmission. Section 2 presents recent developments in the wheat market in Ukraine, with particular attention paid to changes in the relevant policies. In Section 3 we present the methodology used. Since the price relations are presumably affected by the numerous policy changes during the observation period, the method must be able to capture the structural breaks that might result from the frequent changes. Hence, we apply a Markov-switching vector error correction model, which allows for these structural breaks in the price adjustment process. We identify different regimes that correspond to different parameters for short-run price adjustments and for residual variances. These regimes allow an explanation of vertical price transmission both in 'clear-cut' phases and 'transition' periods (e.g., in the course of shifts from export and import situation and *vice versa*). Section 4 presents the empirical results and links the regime probabilities with the economic policy in Ukraine. The paper concludes in Section 5 with a set of policy implications.

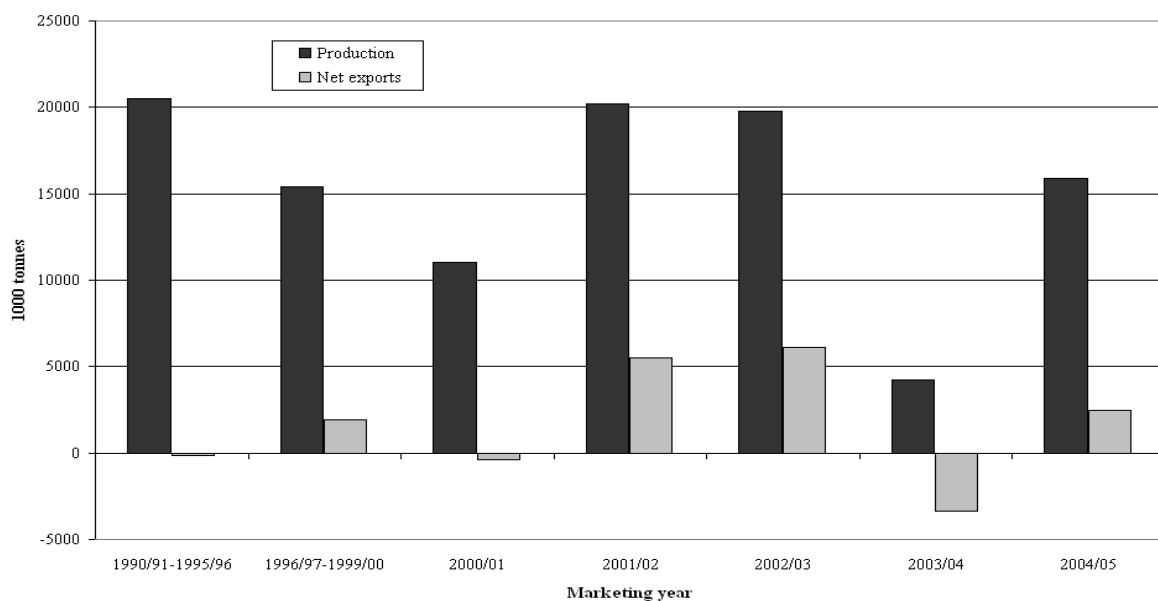
2 POLICY DEVELOPMENTS ON WHEAT AND WHEAT FLOUR MARKETS IN UKRAINE

The policies for Ukrainian grain markets, and wheat markets in particular, have always been politicised. In the course of transition from planned to market economy, Ukraine did not succeed in completely abolishing policy interventions, which were designed and implemented in the old central planning style. Grain is considered 'strategic', and agricultural policy-makers consider "the size of the

grain harvest [as] a barometer of conditions in agriculture" (VON CRAMON-TAUBADEL, 2001, p. 103). Thus, so far the grain market has never fully enjoyed the spirit of the 'market economy'.

In the mid-1990s, the Ukrainian government entrenched itself in its agricultural markets. Through various schemes, the state parastatals supplied the key inputs to the large farms, while other state parastatals collected grain as a payment for these inputs (STRIEWE and VON CRAMON-TAUBADEL, 1999). Since the bankruptcy of large farms has remained a 'taboo', non-payments proliferated. 'Soft budget constraints' predestined the frequent bail-outs from the budget (for example, in 1997 and 1998, then later in 2000). Direct support for the large former state farms in the form of budget support was nevertheless accompanied by a simultaneous taxation of wheat farmers through depressed farm-gate prices. Before the year 2000, Ukraine was in a net export situation and since export marketing costs were excessively high, some experts report that farmers received only 40 % of the FOB export price, compared to 70 % in Germany (STRIEWE and VON CRAMON-TAUBADEL, 1999). In conjunction with the adjustment pressure of transition, these low wheat prices and heavy state interventions led to a fall in production (see Figure 1). As a reaction, many regional administrations at the Oblast level regularly set bans on movements of grains among regions to 'enhance' regional food security. Hence, the national wheat market was fragmented, the policies were difficult to predict, and thus, price forecasts were dominated by substantial uncertainty.

Figure 1: Production and net export of wheat in Ukraine, in 1,000 tonnes, 1990-2004



Source: UKRAGROCONSULT (1998-2004) and FAS/USDA (2000-2004).

In the marketing year 2000/01, Ukraine's wheat harvest dropped to the decade's lowest, 11 mill tonnes, and the country became a net importer of wheat. As a reaction, the government launched a set of progressive reforms, effectively withdrawing from the input and output markets, while the previously abstaining banking sector was encouraged to credit the farms by introducing partial compensation of interest rates from the national budget, thus putting the hard budget constraints on the farms, enhancing large farm restructuring, and granting significant tax privileges to the farmers (DEMYANENKO and ZORYA, 2004; VON CRAMON-TAUBADEL, 2001). But when the country's switch from net exporter to net importer (mainly due to the excessively high marketing costs) raised domestic wheat prices over the world market level (Figure 2), policy-makers reacted inadequately. Since many Ukrainian policy-makers still have an inaccurate understanding of market mechanisms and price formation in the market economy, measures to stabilise wheat prices were improperly designed. The government made the traders 'guilty' of high wheat prices, introduced grain export certification, fixed bread prices and attempted to create the pledge price system.² To increase the wheat supply, the policy-makers temporarily cancelled the import duty of wheat and simplified the wheat import regimes, while many regional administrations renewed the bread price regulations. Since those actions were not always transparent and their timing was far from perfect, the uncertainty of price development remained high.

The high prices and low supply of wheat, coupled with the uncertainty concerning future market developments negatively affected the flour producers. Domestic flour production decreased and prices sharply increased (see Figure 3). And since the bread prices were fixed at low levels, the millers could not fully transmit the increase of wheat prices to the bakeries. The flour market began to stabilise only after Ukraine imported much flour, mainly duty-free from the members of the Commonwealth of Independent States free-trade zone.

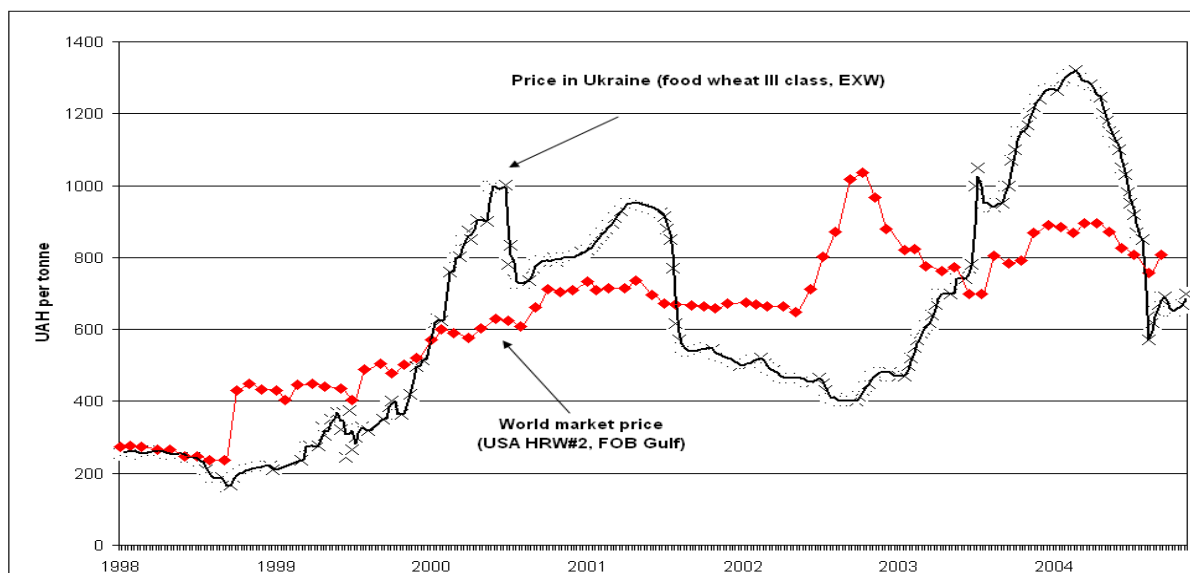
Thanks to high wheat prices, progress in reforms and, certainly, favourable weather, in 2001 the wheat harvest reached the decade's record highest level. The consequent year was similarly successful for the output-oriented policy-makers (Figure 1). Ukraine became a large wheat exporter – in the marketing years of 2001/02 and 2002/03, Ukraine exported almost 12 mill tonnes of wheat. Domestic prices dropped, and during this period policy-makers were preoccupied with the 'market regulation' to raise wheat prices. This drop was especially severe in the first months after harvest, since the farmers, facing the liquidity constraints of financing the fall seeding campaign, had to sell their grain immediately, as they were unwilling to store the grain in the state-run elevators due to contract enforcement problems and high storage costs, and since future price developments

² See Presidential Decree No. 823, "On immediate measures to stimulate grain production and to develop the grain market" from July 29, 2000.

were hardly predictable. The government repeatedly tried to introduce the pledge price system, together with the intervention system, but in every year the lack of budget financing predetermined failure.³ In addition, the government continued regulating exports by prohibiting wheat exports without their contract being registered on the agrarian exchanges. In this period, however, the government also made efforts to reduce marketing costs and encourage private investments into the market infrastructure, especially sea ports and storage facilities. But in spite of these positive efforts, the 'stop-and-go reforms' continued to strain Ukrainian wheat market actors.

In this period of time, Ukrainian millers almost fully satisfied domestic demand. Domestic flour production grew from 3.5 mill tonnes in 2000/01, to 3.65 mill tonnes, on average, in the 2001/2002 and 2002/03 marketing years (APK-INFORM, 2004). Flour prices gradually declined along with wheat prices (Figure 3) and flour imports did not exceed 2 % of the total flour supply.

Figure 2: Domestic and world wheat market prices in Ukraine, 1998-2004, UAH per tonne



Source: UKRAGROCONSULT (1998-2004) and FAO (2004).

In early 2003, severe winterkill greatly damaged the winter 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" (VON CRAMON-TAUBADEL, 2004, p. 183). The wheat harvest equalled roughly 5 mill tonnes (Figure 1) and domestic wheat prices, with the expectation of a low harvest, skyrocketed in the early winter of 2003 (Figure 2). The government issued several resolutions, including provisions concerning the personal

³ See Cabinet of Ministers Resolutions, "On determination of pledge prices and financial support of pledge purchasing of grain" from April 29, 2002, and "On additional measures to manage the pledge and intervention operations" from June 27, 2003.

responsibility of regional politicians, the investigation of traders' activities, and the empowerment of regional authorities to monitor food wheat movements and bread prices.⁴ Later, the government also announced agreements with Russia and Kazakhstan to purchase about 2 mill tonnes of wheat at 'reasonable prices', which in this context implied at a price below the world market level. The press was full of rumours about new and intensified regulation of grain markets in Ukraine and this crisis really provided anti-reform forces with a pretext for the re-introduction of intervention measures. Some experts state, therefore, "that it may be more appropriate to speak of a crisis in agricultural policy making in 2003 than of a 'crisis' in Ukrainian agriculture" (VON CRAMON-TAUBADEL, 2004, p. 185).

The above developments, along with the reluctance to quickly abolish wheat import duties and an import value-added tax, led to the unwillingness of private importers to import wheat under arbitrary legislation and price uncertainty. Due to the temporarily low food wheat supply and inelastic domestic demand, wheat prices significantly fluctuated. Only after large imports in the last three months of 2003 (about 3 mill tonnes) (UKRAGROCONSULT, 1998-2004) did price volatility fall. In the course of the marketing year, wheat prices slowly fell, but not to less than 600 UAH per tonne. Low wheat stocks, uncertainty about the 2004 harvest, and continuously intense policy interventions due to the presidential election at the end of 2004 all kept the food wheat prices high and volatile.

The low wheat harvest and the manner of resolving the wheat crisis itself led to a sharp fall in flour stocks and a subsequent rise in flour prices. While during 2001-2002, the flour price averaged 900 UAH per tonne, in June 2003 it reached 1,800 UAH per tonne and in November 2003 it came very close to 2,000 UAH per tonne (Figure 3). High flour prices and unpredictability concerning food wheat imports caused large flour surges, mainly from Russia and Kazakhstan. In the marketing year 2003/04, Ukraine imported 5 % of its total flour supply, or 207,000 tonnes (APK-INFORM, 2004). In addition to flour imports, the State Material Reserve of Ukraine began to finance the milling and selling of flour in large quantities. This 'state' flour, however, was arbitrarily available to only large regional mills. These state interventions crowded out the private mills and seriously increased uncertainty concerning flour stocks, equal access to these stocks and flour market prices. In the course of 2004, flour prices stabilised and gradually decreased.

⁴ Cabinet of Ministers Resolution No. 1150, "On failures of some executive branches to ensure food security, and measures to stabilize the markets of main staple foods" from July 24, 2003.

3 MARKOV-SWITCHING MODEL

The Markov-switching vector error correction model (MSVECM) is a special case of the general Markov-switching vector autoregressive model, which was initially proposed by HAMILTON (1989) for analysing the US business cycle. The applicability of this model is, however, not restricted to this specific research question but can be viewed as a general framework for analysing time series with different regimes whenever the corresponding state variable is not observed. KROLZIG et al., (2002) and KROLZIG and TORO (2001) use the MSVECM to analyse business cycles with a special emphasis on employment. Here, we use a MSVECM for analysing vertical market integration between the markets for wheat and wheat flour in Ukraine. If the markets are integrated, there should exist a long-run relationship between the prices on each market. Price changes on any of the markets depend both on short-run dynamics and on the deviation from the long-run equilibrium so that the familiar vector error correction model would provide a congruent representation of the data generating process. However, with the frequent policy adjustments and changes in the net trade position, it is reasonable to expect structural changes over time, which renders the simple error correction model into an incongruent representation. Hence, a MSVECM, i.e., a vector error correction model with shifts in some of the parameters according to the state of the system, can be expected to be more appropriate in this setting:

$$\Delta \mathbf{p}_t = \boldsymbol{\alpha}_0(s_t) + \boldsymbol{\alpha}(s_t)(\boldsymbol{\beta}' \mathbf{p}_{t-1}) + D_1(s_t)\Delta \mathbf{p}_{t-1} + D_2(s_t)\Delta \mathbf{p}_{t-2} + \dots + D_k(s_t)\Delta \mathbf{p}_{t-k} + \boldsymbol{\varepsilon}_t \quad (1)$$

Here, $\mathbf{p}_t = (p_t^f, p_t^m)'$ is the vector of market prices for wheat flour (superscript f) and wheat (superscript w), respectively, $\boldsymbol{\alpha}_0$ denotes the vector of intercept terms, $\boldsymbol{\alpha}$ is the vector of adjustment coefficients, $\boldsymbol{\beta}$ is the cointegrating (long-run equilibrium) vector, Δ indicates first differences, and D_1, D_2, \dots, D_k are matrices of short-run coefficients. The vector $\boldsymbol{\varepsilon}_t$ contains the residual errors of the flour and wheat equation, for which the usual assumptions apply. The state variable $s_t = 1, \dots, M$ indicates which of the M possible regimes governs the MSVECM at time t . However, the state of the system is not observed; the most general specification would make the probability of being in state s_t dependent on the entire history of regimes S_{t-1} , and on the history of all the variables on the RHS of Equation (1). This general specification would leave the system unidentified unless some structure is imposed. The basic idea of a Markov-switching model is to assume an ergodic Markov process for the probabilities of observing a certain state, so that the probability for s_t depends only on s_{t-1} and a matrix Π of transition probabilities.

$$Pr(s_t | S_{t-1}, \Delta P_{t-1}, \boldsymbol{\beta}' P_{t-1}) = Pr(s_t | s_{t-1}, \Pi) \quad (2)$$

An element π_{ij} of Π gives the transition probability from state i to state j . Hence, the sum of each row of Π must equal one so that the number of unknowns in Π is

equal to $M(M-1)$. Note that the vector does not vary between systems since the long-run equilibrium relation is assumed to be constant over time. However, the intercept term in (1) changes over time so that there may be regime-dependent changes in the margin.

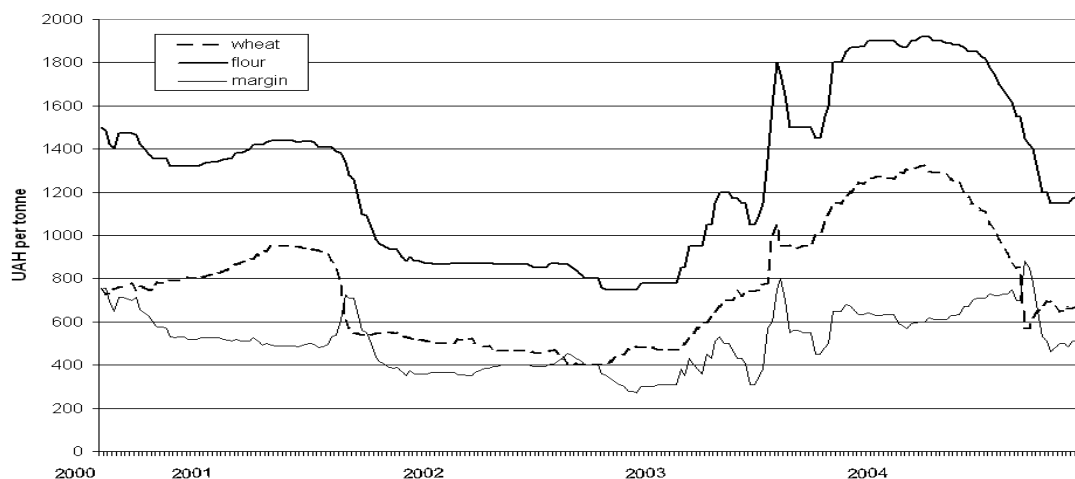
The estimation of the MSVECM is based on the maximum likelihood principle. The maximands of the likelihood function consist of the parameters in (1), a set of parameters corresponding to dummy variables indicating the value of the state variable s_t , and the transition probabilities p_{ij} . KROLZIG (1997) advocates the use of a variant of the Expectation-Maximisation algorithm (DEMPSTER et al., 1977). This iterative procedure breaks the maximisation down into two steps. First, the state parameters and transition probabilities are estimated conditional on a set of starting values for the coefficients in (1). In the second step, these latter parameters are updated using the first order conditions for the maximisation of the likelihood function with respect to the error correction model parameters. This sequence is repeated until the procedure converges, i.e., the state parameters no longer change between two subsequent iterations. The estimation procedure is available in the MSVAR package (KROLZIG, 2004) for the matrix programming language Ox (DOORNIK, 2002).

4 EMPIRICAL RESULTS

4.1 Data and unit root tests

The estimation results are based on 227 weekly observations (June 2000 to November 2004) on the average price for III class milling wheat, and of the whole sale price for top quality flour in Ukraine. Figure 3 gives an overview of the development of the price series in the observation period.

Figure 3: Weekly prices of wheat and flour as well as margin in Ukraine, UAH per tonne, June 2000–November 2004 (227 observations)



Source: UKRAGROCONSULT, 1998-2004.

Both series are characterised by substantial shifts, both in level and in variance over time. As discussed in Section 2, the level shifts for the wheat price series are strongly influenced by the expected net trade balance for wheat in Ukraine, e.g. the sharp decreases in late summer 2001 and 2004. The two price series develop in a roughly parallel way over time. On the other hand, the variation in the margin over time is considerable, in particular at times when any of the series exhibits unusual dynamics. These characteristics raise doubt concerning the stability of the price relationships in terms of dynamics, and underline the necessity of taking into account structural breaks in the further analysis.

As a prerequisite for the cointegration analysis, we first establish the time series properties of the price series (in natural logarithms). The usual ADF test statistic is supplemented with an additional unit root test for processes with level shifts (LANNE et al., 2002). For this latter test, the unknown break point was found through a grid search of all possible break dates with a sufficiently large lag order. The date which gave the minimal residual sum in the auxiliary regression was then chosen. The null hypothesis of a unit root in the undifferentiated series cannot be rejected by any of the two tests. However, the tests provide strong evidence against the null hypothesis of a unit root in first difference series of both the (logs of) flour and wheat prices (Table 1). Even when structural change is taken into account, both price series (in logs) seem to be appropriately modelled as integrated processes of order 1.

Table 1: Results of unit root tests

| Series | Augmented Dickey-Fuller Test | | | Unit root test with level shift | | |
|--------------------|------------------------------|--------------------|--------------------|---------------------------------|-----------------------------------|--------------------|
| | Test statistic | Specification | 5 % critical value | Test statistic | Specification | 5 % critical value |
| $\ln p_t^f$ | -1.556 | (6 lags, constant) | -2.86 | -1.161 | (8 lags, trend, shift dummy) | -3.03 |
| $\ln p_t^w$ | -1.336 | (3 lags, constant) | | -1.468 | (3 lags, trend, shift dummy) | |
| $\Delta \ln p_t^f$ | -4.452 | (5 lags) | -1.94 | -4.473 | (7 lags, constant, impulse dummy) | -2.88 |
| $\Delta \ln p_t^w$ | -6.639 | (2 lags) | | -6.636 | (2 lags, constant, impulse dummy) | |

4.2 Cointegration analysis

For integrated variables, an estimating equation consisting of $I(0)$ variables alone is given by the VECM representation. We apply the usual Johansen trace test, which is based on a successive reduced rank regression of the vector autoregres-

sive representation with 4 lags. The first test, with a null hypothesis of no cointegrating relations, is rejected against the alternative of at least one cointegrating relation with a p-value of less than 0.1 % ($LR^{\text{trace}} = 30.048$). The next test, with a corresponding null that the number of cointegrating vectors is one, against the alternative that the number of cointegrating vectors is larger than one, cannot be rejected ($LR^{\text{trace}} = 1.922$, p-value = 0.167). The two series may hence be linearly combined so that the residual term is stationary. The long-run relationship (including a constant term) is given in Equation (3), with standard errors in parentheses.

$$\ln p_t^f = 1.5976 + 0.8368 \ln p_t^w + u_t \quad (3)$$

(0.200) (0.030)

The corresponding adjustment coefficients (standard errors in parentheses) are $\alpha^f = -0.1274$ (0.026) for the flour equation, and $\alpha^w = 0.0211$ (0.041) for the wheat price equation, respectively. Since the deviations from the long-run equilibrium are obtained from the cointegrating vector normalised with respect to the flour price, both adjustment coefficients have the expected sign. The adjustment coefficient in the wheat price equation, however, is not statistically significant. Hence, the adjustment process towards the long-run equilibrium takes place through price changes for flour, with half of a unit deviation from the long-run equilibrium being corrected within 5 weeks.

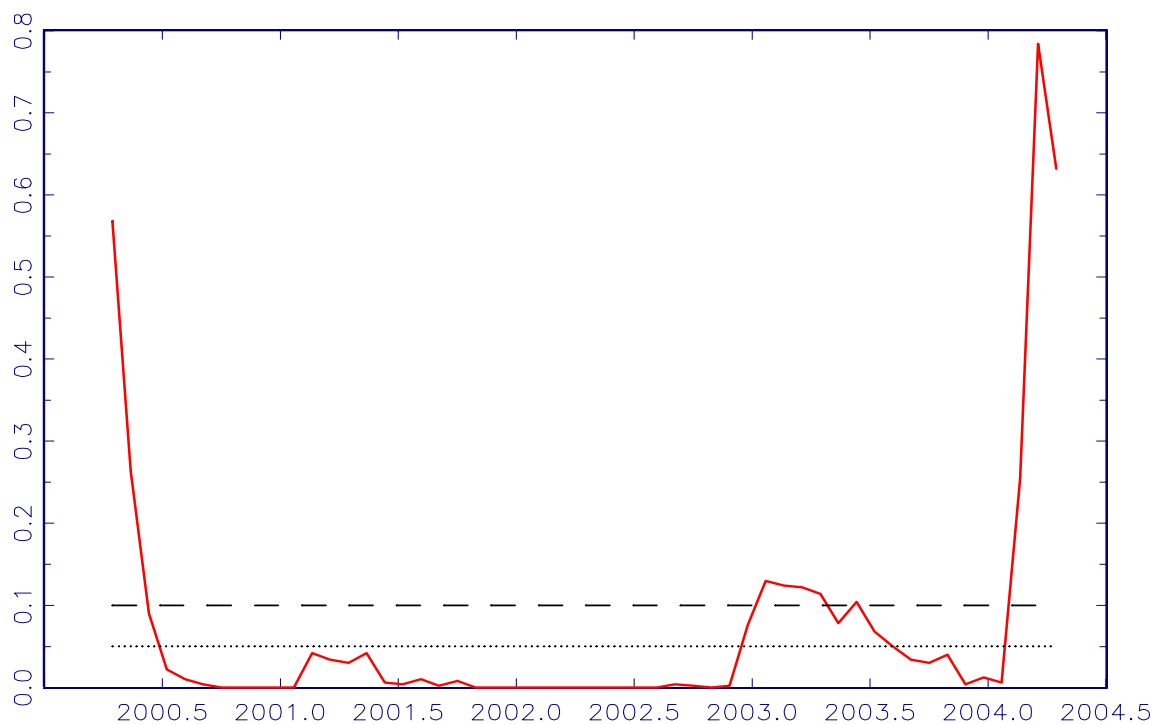
Diagnostic tests of the corresponding vector error correction model reveal several problems. First, autocorrelation was checked by means of a vector autocorrelation test up to lag order 12. The corresponding Lagrange multiplier test statistic is 52.648, which compares to a critical χ^2 value at the 5 % level, with 48 degrees of freedom of 65.17. The residuals of the system seem not to be affected by a significant extent of autocorrelation. The situation is worse with regard to the vector tests for heteroscedasticity and non-normality. The full White test for vector heteroscedasticity yields a test statistic of 268.35, which exceeds the critical χ^2 value with 105 degrees of freedom (129.92) substantially. A similar picture arises for the non-normality test, where the null hypothesis of normal residuals is rejected with a p-value of less than 0.01 %. A closer look at the single equations reveal that most of these problems originate from the flour equation. However, increasing the lag length above the order suggested by the Akaike information criterion (AIC) failed to resolve the problems with heteroskedasticity and autocorrelation.

Thick tails in the distribution of the residuals and heteroskedasticity could both be caused by instability of the underlying price series. Hence, the system is checked for stability by means of a Chow forecast test. The null hypothesis is that all parameters of the system remain constant over time, which is tested against the alternative, that the parameters (all coefficients except for b plus the residual

covariance matrix) change over time. The Chow test statistic is asymptotically χ^2 distributed; however, the actual distribution under the null was found to be non-standard in CANDELON and LÜTKEPOHL (2000) so that the bootstrap provides a feasible alternative. We employ the procedure implemented in JmulTi to calculate the empirical p-values for different breakpoints.⁵

Figure 3 shows the bootstrapped p-values of the Chow forecast test for the sample; every 4th week was used as a possible break date.

Figure 3: Graph of bootstrapped Chow forecast test p-values (based on 500 replications)



The p-values for the vast majority of the searched break date lie substantially below the 5% level (dotted line in Figure 4). Hence, the system seems to be affected by structural breaks; the representation of the price movements on Ukrainian wheat flour and wheat markets as a single, time-invariant error correction model is not appropriate. The following subsection provides the results of an alternative model based on a MSVECM representation, which is found to be better suited for this data set.

4.3 Markov-switching vector error correction model

The number of lags and the number of regimes in the MSVECM have been selected according to the AIC. A formal test for the number of regimes M against the alternative $M+1$ is difficult because a number of parameters of the unrestricted model are not identified under the null hypothesis, leading to a non-standard dis-

⁵ For more details about JmulTi visit <<http://www.jmulti.org>>.

tribution of the usual likelihood-based test statistics. Nevertheless, the AIC turned out to be strongly in favour of the specification with 4 regimes and 3 lags in the VECM. The residual diagnostics for this model are in line with the usual assumptions: Neither vector autocorrelation, heteroscedasticity nor non-normality seem to be problematic for the MSVECM. Hence, this model might be viewed as a congruent representation of the underlying process.

The estimated parameters of the final MSVECM specification using data from June 2000 to November 2004 are presented in Table 2. One interesting feature is the drop in the speed of adjustment coefficients in comparison to the simple VECM. The magnitude of the significant coefficient in the flour equation is reduced by factor 3 (regimes 1-3) and factor 6 (regime 4). The speed of adjustment coefficient in the wheat equation remains statistically insignificant across all regimes. Another intriguing feature is the distinct variation in the residual standard errors σ_ε^f and σ_ε^w between the regimes. Speed of adjustment, residual standard errors and the resulting margin in the long-run relation (which may be calculated from the estimated coefficient for the regime-specific constant and the corresponding speed of adjustment coefficient estimate) allow for a more detailed interpretation of the single regimes.

- **Regime 1: "Normal trade"** is characterised by relatively small values for the residual standard errors σ_ε^f and σ_ε^w ; both the margin (which depends on the constant, once restricted to the error correction term) and the speed of adjustment parameter in the flour equation is at its usual level ($\alpha^f = -0.04$).
- **Regime 2: "Calming"** exhibits still-increased residual standard errors (σ_ε^f : factor 1.5, σ_ε^w : factor 3 relative to regime 1); margin and α^f are back at the usual levels.
- **Regime 3: "Alert"** shows a strong increase in the variability of the errors for flour (σ_ε^f : factor 7, σ_ε^w : factor 2 relative to regime 1); the margin is slightly reduced by about 12 %, and α^f is still unchanged.
- **Regime 4: "Disarray"** has the highest residual standard errors in both equations (σ_ε^f : factor 10, σ_ε^w : factor 12 relative to regime 1); the margin is exceptionally high, and the speed of adjustment in the flour price change equation is halved.

Table 2: Markov-switching vector error correction model (MS(4)-VECM(3))

| | Regime 1 | | Regime 2 | | Regime 3 | | Regime 4 | |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | ΔP^f | ΔP^w | ΔP^f | ΔP^w | ΔP^f | ΔP^w | ΔP^f | ΔP^w |
| Const. | 0.063* | -0.013 | 0.063* | -0.013 | 0.063* | -0.013 | 0.063* | -0.013 |
| | (0.011) | (0.021) | (0.011) | (0.021) | (0.011) | (0.021) | (0.011) | (0.021) |
| ΔP^f_{t-1} | -0.030 | -0.299* | 0.236* | -0.173 | 0.233* | 0.110* | 0.240 | 0.877* |
| | (0.034) | (0.055) | (0.064) | (0.206) | (0.092) | (0.051) | (0.221) | (0.417) |
| ΔP^f_{t-2} | 0.051* | 0.043 | 0.097 | -0.035 | -0.124 | 0.051 | 0.789* | 0.592 |
| | (0.026) | (0.043) | (0.057) | (0.177) | (0.117) | (0.061) | (0.251) | (0.452) |
| ΔP^f_{t-3} | -0.221* | -0.295* | 0.001 | -0.224* | 0.163 | 0.075 | 0.431 | 1.054 |
| | (0.030) | (0.048) | (0.035) | (0.111) | (0.094) | (0.057) | (0.366) | (0.662) |
| ΔP^w_{t-1} | 0.293* | 0.619* | -0.039* | 0.038 | 0.308* | 0.329* | -0.351 | -0.999* |
| | (0.063) | (0.105) | (0.018) | (0.056) | (0.107) | (0.061) | (0.220) | (0.421) |
| ΔP^w_{t-2} | -0.017 | -0.208* | 0.048 | 0.410* | -0.361* | 0.096 | 1.275* | 1.450* |
| | (0.011) | (0.018) | (0.035) | (0.121) | (0.109) | (0.064) | (0.361) | (0.661) |
| ΔP^w_{t-3} | 0.044 | 0.432* | 0.068 | 0.508* | 0.222* | -0.026 | 0.160 | 2.941* |
| | (0.032) | (0.054) | (0.040) | (0.130) | (0.056) | (0.032) | (0.395) | (0.725) |
| ECT _{t-1} | -0.041* | 0.008 | -0.041* | 0.004 | -0.044* | 0.014 | -0.026* | -0.027 |
| | (0.007) | (0.013) | (0.007) | (0.013) | (0.007) | (0.013) | (0.010) | (0.018) |
| | | | | | | | | |
| $\sigma_{\varepsilon}^{f/w}$ | 0.0034 | 0.0056 | 0.0052 | 0.0170 | 0.0229 | 0.0123 | 0.0368 | 0.0631 |
| | | | | | | | | |
| Con- stant re- stricted in the ECT term | -1.5604 | | -1.5301 | | -1.4489 | | -2.4179 | |

Source: Own calculations using MSVAR for Ox (KROLZIG, 2004; DOORNIK, 2002).

Notes: All data is in natural logarithm. Standard errors in parentheses.

* Means statistical significance at 1 %.

The transition matrix Π in Table 3 contains the transition probabilities from regime s_{t-1} to regime s_t . The values on the main diagonal indicate the probability of no change in the regime. Regimes 1 and 2 are found to be the most persistent, which is also indicated by the average duration of each regime. While regimes 1 and 2 both last for about 4 weeks on average, regime 3 is only 2 weeks on average, and regime 4 only has a mean duration of 1½ weeks. From either regime 1 or 2, if a regime change takes place, regime 3 is the most likely outcome in the subsequent period (probabilities of 14 and 15 %, respectively). From regime 3, the system might either calm down (regime 2: 24 %; regime 1: 12 %), or the uncertainty in the market might culminate in disarray (regime 3: 12 %). Once in regime 4, the usual route of calming goes via regime 3 as an intermediate step (37 %) or directly into regime 1 with a 19 % probability. Note, however, that

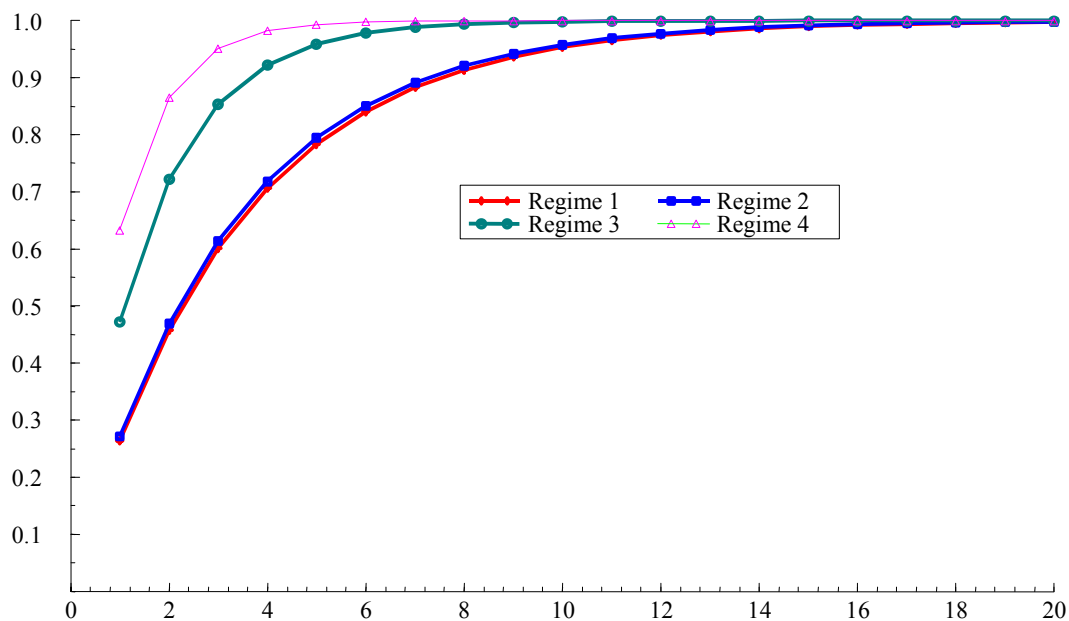
even this state of disorientation in the market has some persistence, with a probability of no change of 37 %.

Table 3: Transition matrix for the MSVECM with 4 regimes

| From regime ... \ To regime ... | To regime ... | | | |
|---------------------------------|---------------|-------|-------|-------|
| | 1 | 2 | 3 | 4 |
| 1 | 0.736 | 0.067 | 0.142 | 0.055 |
| 2 | 0.121 | 0.728 | 0.151 | 0.000 |
| 3 | 0.117 | 0.236 | 0.528 | 0.119 |
| 4 | 0.194 | 0.069 | 0.370 | 0.367 |

Figure 5 provides more information on the duration of each regime. The graph plots the cumulative probability on the y-axis against the duration of the regime on the x-axis. Regimes 1 and 2 follow virtually indistinguishable routes, while regime 3 is substantially shorter. The "disarray" of regime 4 is not very stable; the probability of observing it for more than 3 subsequent weeks is less than 5 %.

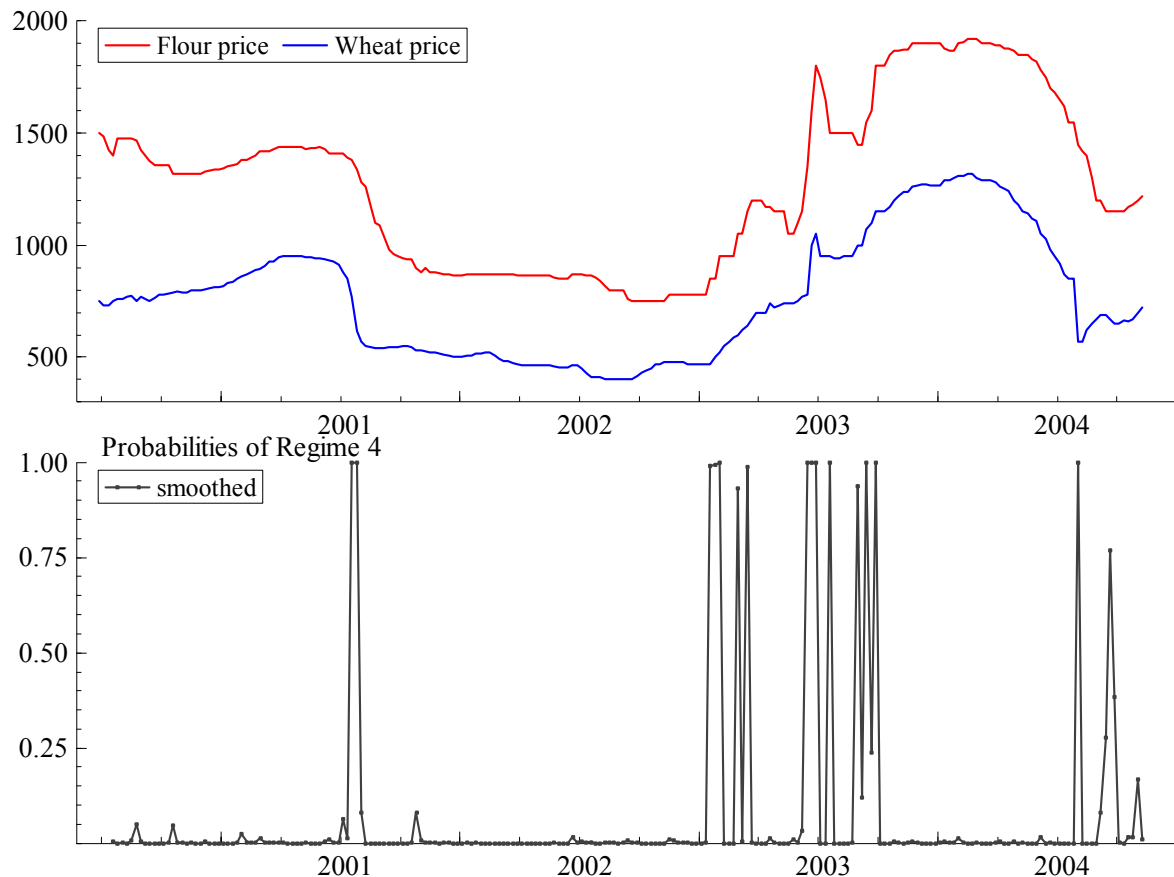
Figure 4: Cumulative probabilities for duration of regime s_t less than or equal to t weeks



In Section 2, we discussed various factors which might have been important determinants of market integration in Ukrainian flour and wheat markets during the observation period. In the next step, we try to link these events to the observed regimes of the MSVECM. In particular, regime 4 is the most interesting, because the lack of adjustment and the inflated uncertainties in the price equations imply a substantial social cost for the Ukrainian wheat economy. In Figure 6, the development of the two price series in the top panel is compared with the smoothed probabilities for regime 4 in the bottom panel. These latter indicate the probability

that the system state is in regime 4 at time t . The distinct peaks of the graph highlight that regime 4 is clearly identified, although it is the most rare of the four regimes.

Figure 5: Price development for flour and wheat in Ukraine and probabilities of regime 4, 2000-2004



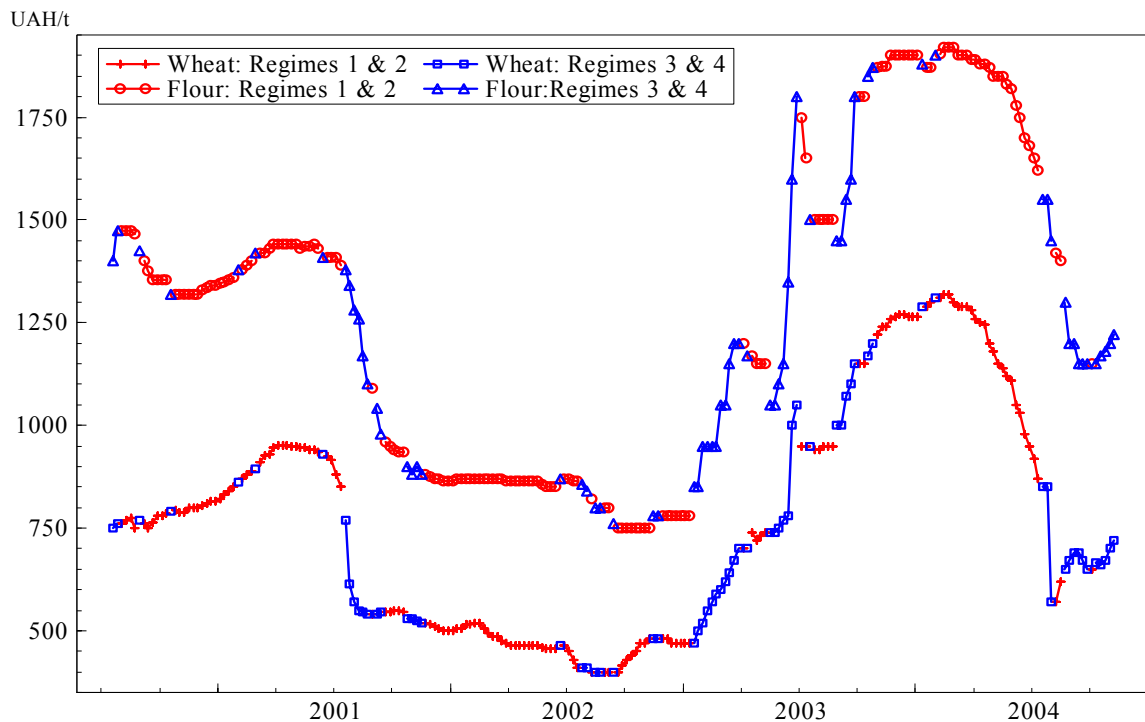
The peaks for the probability of observing regime 4 occur at times when the flour and wheat markets in Ukraine were subject to major shocks. The first peak corresponds to the second half of July 2001. This corresponds to the start of an extraordinarily good harvest, which also initiated a change in the net trade balance for wheat, from a net import situation to a net export situation. The price for wheat dropped more rapidly than the price for wheat flour, leading to an above-average margin. The following period, to the beginning of 2003, seems to be rather stable; the first indication of "disarray" shows up no earlier than the end of January, 2003. At that time, the first news concerning the severe winterkill of the wheat crop in Ukraine began to spread. The subsequent one-period occurrences of regime 4 in the 9th and 11th week of 2003 belong to the same category; they are probably influenced by partially conflicting information about the actual extent of the damage to the wheat crop caused by winterkill.

In the course of the year 2003, several other peaks can be observed which are of particular interest since they can be linked to direct policy interventions on the

market for wheat and wheat flour. The first set occurs in the summer, begins with a duration of three weeks (24th-26th week of 2003), and is followed by a one-period observation in week 29. These dates coincide with heavy political activity; both on June 29 and July 24, important cabinet resolutions were issued which set out the intended government reaction to the low harvest and to the possible shortage of domestic wheat. The temporal lead of two weeks, observed in regime 4, is explained by the intense public discussion preceding the official resolutions. The interventionist character of many of the proposed measures, e.g. allowing for the regional control of physical grain shipments, or regulating bread prices, set the normal market relationships into turmoil, as signalled by the high probability for regime 4. After this period, a "calming" is observed. However, this lasted for just approximately four weeks. Then, rumours spread concerning wheat imports from Kazakhstan and Russia at very favourable conditions. Indeed, the official announcement of the import falls within this block, which consists of three single-period observations of regime 4 in weeks 35, 37, and 39. With the beginning of October, the error correction model between flour and wheat markets shifted again towards the more stable regimes. Figure 7 provides a more aggregate view by only distinguishing between 'normal' regimes (1 and 2), which are characterised by relatively low residual standard errors, and 'alert' regimes (3 and 4), which exhibit much higher residual standard errors. According to this graph, most of the year 2003 must be viewed as a period in which the markets were functioning in a far from stable manner. This supports the view by, VON CRAMON-TAUBADEL (2004), amongst others, that the perceived crisis is more likely due to agricultural policy, and not a crisis of agriculture itself.

Both Figure 6 and Figure 7 indicate that regimes 3 and 4 dominate the markets again beginning in July 2004. These recent regime shifts can be linked to the campaign for the presidential election. Both candidates explicitly referred to the regulations of wheat trade, and those of bread price control in their election programmes. It seems as if the ups and downs of the pre-election opinion polls corresponded, at least partially, to the price relationships of wheat flour and wheat.

Figure 6: ‘Normal’ (1&2) and ‘alert’ (3&4) regimes of the MSVECM for wheat and flour prices in Ukraine, 2000-2004



5 CONCLUSIONS

This paper analysed vertical market integration between the markets for wheat and wheat flour in Ukraine over the years 2000-2004. The political interventions on these markets have been manifold, and the impact of many of these interventions on the functioning of the markets remains questionable. In particular, political reactions to changes in the net trade balance for wheat were discussed. These reactions were often neither transparent nor consistent; their credibility was often unclear. Also, most of the acts and resolutions passed by the cabinet were often accompanied by rumours in the market.

In view of this background, we assume that structural stability of the price relationship between wheat and wheat flour might be too strong an assumption. The suspicion of structural instability was found to be confirmed in the analysis of the basic vector error correction model by means of a Chow forecast test. Instead of this standard model, we explored the usefulness of the Markov-switching vector error correction model (MSVECM) for the case at hand. The MSVECM has found increasing popularity in the business cycle literature in recent years. We employ this model for the analysis of market integration between wheat and flour markets in Ukraine, using 228 weekly observations on the price of wheat and flour from June 2000 to November 2004. The MSVECM specification for the

logarithmic price series with three lags (in differences) and four regimes was found to be a congruent representation of the underlying process.

The endogenously estimated regimes could be interpreted as different conditions which govern the price relationship between flour and wheat at a given point in time. Differences in the residual standard errors, the margin between the two prices and the magnitude of the speed of adjustment coefficient all constitute the main characteristics of each regime. The most imprecise regime, i.e., the one with the highest residual variance and most volatile margin, is the estimated regime No. 4. The prevalence of this regime over time could be linked to the development of certain factors outside the model. In particular, for the year 2003, and the latter part of 2004, political interventions and high probabilities for regime 4 movement occur concurrently; this is a particular negative feature since the proclaimed goal of many of the interventionist measures was to dampen instabilities on the wheat market. The social cost of pushing otherwise well-functioning markets in a regime of "disarray" is considerable. Finally, it was shown that the relationship between wheat and wheat flour prices was also affected by the turbulence of the 2004 presidential campaign. The future development of agricultural policy in Ukraine should acknowledge these results and refrain from discretionary interventions in the markets to avoid increased uncertainty regarding price relationships.

The approach, although already found useful in its present form, could be extended by aiming at the direct incorporation of policy variables. For example, based on the rigorous screening of newspapers and similar media, it could be used to construct an index of awareness for new developments on the corresponding markets. Such information could then be utilised in the econometric procedure of checking whether a re-estimation of the MSVECM, taking this prior information on the state variable into account, provides a similar picture or not.

REFERENCES

- APK-INFORM (2004): Ukrainian grain market, Weekly Analytical and Statistical Report, *APK Inform*, July, Kyiv/Ukraine.
- CANDELON, B., LÜTKEPOHL, H. (2000): On the reliability of chow type tests for parameter constancy in multivariate dynamic models, HUMBOLDT-UNIVERSITÄT BERLIN (ed.): *Discussion Paper*.
- DEMYANENKO, S., ZORYA, S. (2004): Taxation and Ukrainian agriculture, in: VON CRAMONTAUBADEL, S., DEMYANENKO, S., KUHN, A. (eds.). *Ukrainian Agriculture – Crisis and Recovery*, Shaker Verlag, Aachen, pp. 25-39.
- DOORNIK, J. (2002): *Object-oriented matrix programming using Ox*, 3rd ed., Timberlake Consultants Press and Oxford London, <www.nuff.ox.ac.uk/Users/Doornik>.
- FAO (2004): World market prices of wheat, U.N. Food and Agriculture Organisation, <<http://www.fao.org>>.

- FAS/USDA (2000-2004): Grain market reports, Foreign Agricultural Service, U.S. Department of Agriculture, Kyiv/Ukraine.
- KROLZIG, H.-M. (2004): MSVAR – An Ox package designed for the econometric modelling of univariate and multiple time series subject to shifts in regime, Version 1.31k, <<http://www.economics.ox.ac.uk/research/hendry/krolzig/msvar.html>>.
- KROLZIG, H.-M., TORO, J. (2001): A new approach to the analysis of business cycle transitions in a model of output and employment, DEPARTMENT OF ECONOMICS, UNIVERSITY OF OXFORD (ed.): *Discussion Paper Series No. 59*.
- KROLZIG, H.-M., MARCELLINO, M., MIZON, G. E. (2002): A Markov-switching vector equilibrium correction model of the UK labour market, *Empirical Economics*, Vol. 7(2), pp. 33-254.
- LANNE, M., LÜTKEPOHL, H., SAIKKONEN, P. (2002): Comparison of unit root tests for time series with level shifts, *Journal of Time Series Analysis*.
- STRIEWE, L., VON CRAMON-TAUBADEL, S. (1999): Die Getreideproduktion der Ukraine: Verpasste Chancen und dringender Handlungsbedarf, in: VON CRAMON-TAUBADEL, S., STRIEWE, L. (eds.): *Die Transformation der Landwirtschaft in der Ukraine: Ein weites Feld*, Wissenschaftsverlag Vauk Kiel KG, pp. 74-87.
- UKRAGROCONSULT (1998-2004): *Agrinews, Weekly Issues*, Kyiv/Ukraine.
- VON CRAMON-TAUBADEL, S. (2001): Price determination and government policy on Ukrainian grain markets, in: VON CRAMON-TAUBADEL, S., ZORYA, S., STRIEWE, L. (eds): *Policies and Agricultural Development in Ukraine*, Shaker Verlag, Aachen, pp. 103-112.
- VON CRAMON-TAUBADEL, S. (2002): Grain market regulation in Ukraine: Options and evaluation, INSTITUTE FOR ECONOMIC RESEARCH AND POLICY CONSULTING IN UKRAINE (ed.): *Advisory Paper S6*, <www.ier.kiev.ua>.
- VON CRAMON-TAUBADEL, S. (2004): The 2003 wheat harvest: Crisis! What crisis?, in: VON CRAMON-TAUBADEL, S., DEMYANENKO, S., KUHN, A. (eds.): *Ukrainian Agriculture – Crisis and Recovery*, Shaker Verlag, Aachen, pp. 183-200.

MARKETING MARGINS AND PRICE TRANSMISSION ON THE HUNGARIAN PORK MARKET

*LAJOS ZOLTÁN BAKUCS**, *IMRE FERTŐ***

ABSTRACT

The analysis of the vertical price relationship along the supply chain between producers to consumers has become, over recent decades, a popular tool for evaluating the efficiency and degree of competition in agri-food systems. There is a wealth of literature on the farm-retail price spread for different commodities and countries. However, with one exception (BOJNEC, 2002) none have studied price transmission and marketing margins in the transition economies. It is a common belief that because of distorted markets inherited from the pre-1989 period, the deficiency of the price-discovery mechanisms, and unpredictable policy interventions, marketing margins are generally larger in the transition economies than in competitive markets. Using cointegration analysis, we find that producer and retail pork prices are cointegrated, with the retail prices entering the cointegration space as weakly exogenous variables. Structural tests imposing homogeneity conditions are carried out and show a competitive pricing strategy. Price transmission modelling suggests that, despite the common belief, price transmission on the Hungarian pork market is symmetric.

Keywords: *Marketing margins, asymmetric price transmission, error correction, pork market.*

* Research fellow, Institute of Economics, Hungarian Academy of Sciences, Budapest, Hungary, Email: bakucs@econ.core.hu.

** Senior research fellow, Institute of Economics, Hungarian Academy of Sciences, Budapest, Hungary.

1 INTRODUCTION

Measuring the spread of vertical price relationships and analysing the nature of price transmission along the supply chain from the producer to consumer have evolved as widely-used methods to gain insight into the functioning of, and degree of competition in, food markets. Asymmetric price transmission has been studied by numerous authors using different econometric methods, from the classical WOLFFRAM (1971) and HOUCK (1977) specification to cointegration (VON CRAMON-TAUBADEL, 1998) and threshold autoregressive models (e.g. GOODWIN and HARPER, 2000). However, none of these studies (except BOJNEC, 2002) focus on a transition economy. Because of the inherited pre-1989 distorted markets, under-developed price-discovery mechanisms and often ad-hoc policy interventions, transitional economies could be expected to have generally larger marketing margins and more pronounced price transmission asymmetries.

The aim of this paper is to investigate the dynamics of the marketing margin on the Hungarian pork market. The paper is organised as follows: Section 2 briefly describes the development of the Hungarian pork sector during the past decade. Section 3 reviews some of the theoretical literature concerning marketing margins and price transmission, while Section 4 describes the empirical procedures we apply. Our data and results are reported and discussed in Section 5, with a summary and some conclusions presented in Section 6.

2 DEVELOPMENT OF THE HUNGARIAN PORK SECTOR

Hungarian agriculture was traditionally considered a success story amongst the Central and East European Countries. However, like most post-1989 agricultural markets, the pork sector has experienced numerous structural changes in the past 12 years. From 9.5 million head in September 1990, the pig stock decreased to 4.3 million by December 1994, and has fluctuated at around 5 million head ever since. One important feature of the Hungarian pig sector is the large number of small-scale farms. Even before the privatisation, small-scale farms accounted for 50 % of the total pig stock, a number which has not significantly changed. Many of these small-scale farms do not have commercial activity, i.e., they are subsistence farms. However, a large proportion do sell their products, forming a two-tier commercial and family pork production system. Price is the main indicator for both farm types, and links the different market levels of the food industry to the retail sector. The Hungarian food industry is characterised by a distorted market structure emphasised by the large number of small, not very cost-efficient firms. The dramatic decrease of raw material production left many of the formerly-efficient larger companies struggling with unused processing capacity. JANSIK (2000) studying foreign direct investment (FDI) in Hungary, finds that industries characterised by a monopolistic market structure (sugar,

vegetable oil, tobacco, soft drinks, starch) were privatised in the early 1990s, having over 70 % foreign ownership of their capital. Meat processing is the largest food industry, accounting for over 18 % of the total Hungarian food processing output (JANSIK, 2000, p. 99). However, Hungarian privatisation started late – in the mid 1990s – and was characterised by low FDI, with now approximately 40 % foreign ownership in its capital. Thus, the much needed concentration process was delayed, the four-firm concentration ratio in the meat industry being 34.1 % in 1996 and 46.1 % in 1998 (GUBA, 2001). An often chaotic government intervention policy only added to market unpredictability. The producer subsidy equivalent (PSE) for pork producers ranged from -37.2% in 1996 to 22.6 % in 1998 and that of pork processors from -20.3 % in 1998 to 10.6 % in 1994 (GUBA, 2001).

3 MARKETING MARGIN AND PRICE TRANSMISSION

3.1 Theoretical background

The marketing margin is the difference between the retail and the producer or farm gate price. This represents marketing costs such as transport, storage, processing, wholesaling, retailing, advertising, etc.

$$P^R = P^P + M \quad (1)$$

M, the marketing margin, is composed of an absolute amount and a percentage or mark-up of the retail price:

$$M = a + b \cdot P^R, \text{ where } a \geq 0 \text{ and } 0 \leq b < 1. \quad (2)$$

On a competitive market $b=0$, therefore, M will be the constant a equalling the marginal cost. However, if the market structure is monopolistic, the processors and retailers will try to push the marketing margin above the marginal cost, by b percent of the consumer price, where $0 < b < 1$. Substituting (2) in (1) we have:

$$P^R = a + b \cdot P^R + P^P \quad (3)$$

$$P^R = \frac{1}{1-b} a + \frac{1}{1-b} P^P \quad (4)$$

If there is perfect competition on the market, and $b=0$, equation (4) is reduced to $P^R = a + P^P$, and thus $M = a$.

The traditional belief is that responses to price increases differ from responses to price decreases. More exactly, retailers tend to more rapidly pass price increases to consumers, whilst it takes longer for consumer prices to adjust to producer prices if the latter decrease. There are several major explanations for the existence of price asymmetries. First, asymmetrical price transmission occurs when firms can take advantage of quickly changing prices. This is explained by the

theory of the *search costs* (MILLER and HAYENGA, 2001). They occur in locally-imperfect markets, where retailers can exercise their local market power. Although customers would have a finite number of choices, they might face difficulties in quickly gathering information about the pricing of competing stores because of search costs. Thus, firms can quickly raise the retail price as the producer's price rises, and reduce much slower retail prices when upstream prices decline. Second comes the problem of *perishable goods* (WARD, 1982), which prevents retailers from raising prices as producer prices rise. Wholesalers and retailers in possession of perishable goods may resist the temptation of increasing prices because they risk lower demand and ultimately being left with the spoiled product. Third, the adjustment costs or *menu costs* (GOODWIN and HOLT, 1999) may underlie asymmetric price adjustments. Menu costs involve all the cost occurring with the re-pricing and the adoption of a new pricing strategy. As with perishable goods, menu costs also act against retailers changing prices. Finally, the *exercise of oligopolistic power* can favour asymmetric price transmission. This appears in markets with highly inelastic demand and concentrated supply; many food chains have such market organisation characteristics. It must be mentioned that such collusive behaviour is rather difficult to maintain in long run because of the incentive for one firm to cheat the others (MILLER and HAYENGA, 2001, p. 554).

3.2 Empirical evidence

There are a great number of empirical studies dealing with marketing margin and asymmetry problems in livestock markets. VON CRAMON-TAUBADEL (1998) finds asymmetrical price transmission on the German pork market. DAWSON and TIFFIN (2000) identify a long-run price relationship between UK lamb farm-retail prices, and study the seasonal and structural break properties of the series, concluding that the direction of Granger causality is due to retail to producer prices; thus, lamb prices are set in the retail market. Threshold Autoregressive Models were developed by GOODWIN and HOLT (1999), GOODWIN and HARPER (2000) and BEN-KAABIA, GIL and BOSHNJAKU (2002) studying the US beef sector, US pork sector and Spanish lamb sector, respectively. GOODWIN and HOLT (1999) find that farm markets do adjust to wholesale market shocks, whilst the effect of the retail market shocks are largely confined to retail markets. GOODWIN and HARPER (2000) in their pork market study find a unidirectional price information flow from farm to wholesale and retail levels. Farm markets adjust to wholesale market shocks, but retail level shocks are not passed on to wholesale or farm levels. BEN-KAABIA, GIL and BOSHNJAKU (2002) establish a symmetric price transmission, concluding a long-run perfect price transmission, where any supply or demand shocks are fully transmitted through the system. They also observe that an increased horizontal concentration allows retailers to exercise market power.

ABDULAI (2002) uses a Momentum-Threshold Autoregressive Model (M-TAR) for studying price transmission on the Swiss pork market. He also concludes that price transmission between producer and retailer market levels is asymmetric, i.e., increases in producer prices that would diminish the marketing margin are passed on more quickly than producer price decreases that widen marketing margins. MILLER and HAYENGA (2001) study the US pork market price transmission in conjunction with price cycles, concluding that wholesale prices adjust asymmetrically to changes in farm prices in all cycle frequencies. BOJNEC (2002) finds that both the Slovenian farm-gate beef and pork markets are weakly exogenous in the long run, with a mark-up long-run price strategy for beef and a competitive price strategy for the pork market. REZITIS (2003) applies a Generalised Autoregressive Conditional Heteroscedastic (GARCH) approach when studying causality, price transmission and volatility spillover effects in lamb, beef, pork and poultry markets in Greece.

The results emphasise the presence of feedback between the different market levels, and support the imperfect price transmission between farm and retail markets in all meat categories studied. In short, most studies find asymmetrical price transmission in livestock markets, and also establish a mostly unidirectional price information flow from farm to wholesale, and finally to retail levels.

4 EMPIRICAL PROCEDURE

Ever since NELSON and PLOSSER'S (1982) seminal work, we know that most macroeconomic time series are not stationary over time, i.e., they contain unit roots. That is, their mean and variance are not constant over time. Utilising the standard classical estimation methods (OLS) and statistical inference can result in biased estimates and/or spurious regressions.

Even though many individual time series contain stochastic trends (i.e., they are not stationary at levels), many of them tend to move together over the long run, suggesting the existence of a long-run equilibrium relationship. Two or more non-stationary variables are cointegrated if there exists one or more linear combinations of the variables that are stationary. This implies that the stochastic trends of the variables are linked over time, moving towards the same long-term equilibrium.

4.1 Testing for unit roots

Consider the first order autoregressive process, AR(1):

$$y_t = \rho y_{t-1} + e_t \quad t = \dots, -1, 0, 1, 2, \dots, \text{ where } e_t \text{ is white noise.} \quad (5)$$

The process is considered stationary if $|\rho| < 1$, thus testing for stationarity is equivalent with testing for unit roots ($\rho = 1$). (5) is rewritten to obtain:

$$\Delta y_t = \delta y_{t-1} + e_t, \text{ where } \delta = 1 - \rho \quad (6)$$

and thus the test becomes:

$H_0 : \delta = 0$ against the alternative $H_1 : \delta < 0$.

Of several ways to test for unit roots, we applied the Augmented Dickey-Fuller (ADF) test (DICKEY and FULLER, 1979; 1981). The test consists of estimating equation (7) using OLS:

$$\Delta y_t = \alpha + \beta t + \delta y_{t-1} + \sum_{i=1}^p \theta_i \Delta y_{t-i} + \varepsilon_t \quad (7)$$

where α is the drift term, β is the intercept, and $\sum_{i=1}^p \theta_i \Delta y_{t-i}$ are lagged values of the independent variable to account for the autocorrelations in the residuals. Critical values to test the null of a unit root are tabulated in DICKEY and FULLER (1979).

4.2 Cointegration analysis

The two most widely used cointegration tests are the Engle-Granger two-step method (ENGLE and GRANGER, 1987) and JOHANSEN'S multivariate approach (JOHANSEN, 1988). ENGLE and GRANGER base their analysis on testing the stationarity of the error term in the cointegrating relationship. An OLS regression is run and the residuals are tested for unit roots. If the null of non-stationarity can be rejected, the variables are considered to be cointegrated.

The JOHANSEN testing procedure has the advantage of allowing for the existence of more than one cointegrating relationship (vector) and the speed of adjustment towards the long-term equilibrium is easily computed. The procedure is a Maximum Likelihood (ML) approach in a multivariate autoregressive framework with enough lags introduced to have a well-behaved disturbance term. It is based on estimation of the Vector Error Correction Model (VECM) of the form:

$$\Delta \mathbf{Z}_t = \Gamma_1 \Delta \mathbf{Z}_{t-1} + \dots + \Gamma_{k-1} \Delta \mathbf{Z}_{t-k+1} + \Pi \mathbf{Z}_{t-k} + \Psi \mathbf{D} + \mathbf{u}_t \quad (8)$$

where $\mathbf{Z}_t = [P_t^R, P_t^P]'$, a (2 x 1) vector containing the farm and retail prices, both $I(1)$, $\Gamma_1, \dots, \Gamma_{k-1}$ are (2x2) vectors of the short-run parameters, Π is (2x2) matrix of the long-run parameters, Ψ is a (2x11) matrix of parameters, \mathbf{D} are 11 centred seasonal dummies and \mathbf{u}_t is the white noise stochastic term.

$\Pi = \alpha\beta'$, where matrix α represents the speed of adjustment to disequilibrium and β is a matrix which represents up to (n - 1) cointegrating relationships between the non-stationary variables. There are several realistically-possible models in (8) depending on the intercepts and linear trends. Following HARRIS (1995) these models, defined as models 2-4, are: M2 where the intercept is restricted to the cointegration space – in the present application this can represent a constant absolute component of the marketing and processing margin (BOJNEC, 2002); M3 with unrestricted intercept but no trends – the intercept in the cointegration space combines with the intercept in the short-run model, resulting in an overall

intercept contained in the short-run model; M4 where if there exists an exogenous linear growth not accounted for by the model, the cointegration space includes time as a trend stationary variable.

Because it is usually not known *a priori* which model to apply, the Pantula principle (HARRIS, 1995) is used to simultaneously test for the model and the cointegration rank.

The VECM lag length is determined using the Akaike Information Criterion (AIC) and the Schwarz-Bayesian Criterion (SBC), then the cointegration rank is selected by the trace and maximum Eigen values.

4.3 Causality and the nature of the marketing margin

Once (8) is estimated we can proceed to test for weak exogeneity and then for linear restrictions on the β vector. The terms of vector α (factor loading matrix) measure the speed at which the variables adjust towards the long-run equilibrium after a price shock. Testing for weak exogeneity equals testing the number of 0 rows in α . The α vector of the weakly exogenous variable equals zero.

To find the direction of the Granger causality between the two price series, restrictions are tested on the α vectors.

Structural tests are carried out to establish whether the pork market is competitive. A market is considered competitive if the farm gate and retail prices are linked through a constant absolute margin. The test consists of imposing a homogeneity constraint on the price coefficients of the following form: $H_0 : \beta_{PR} = -\beta_{PP}$.

A likelihood ratio test is used to test the restriction.

4.4 Asymmetrical error correction representation

Most asymmetry analysis uses the following WARD (1982) specification, based on the earlier Woffram (1971) and Houck (1977) specification:

$$\Delta P_t^R = \alpha + \sum_{j=1}^K (\beta_j^+ D^+ \Delta P_{t-j+1}^P) + \sum_{j=1}^L (\beta_j^- D^- \Delta P_{t-j+1}^P) + \gamma_t \quad (9)$$

Here, the first differences of the producer prices are split into increasing and decreasing phases by the D^- and D^+ dummy variables. Asymmetry is tested using a standard F-test to determine whether β_j^+ and β_j^- are significantly different.

These approaches do not pay attention to the time series properties of the data and many of them suffer serial autocorrelation, which usually suggests spurious regression.

With the development of cointegration techniques, attempts were made to test asymmetry in a cointegration framework. VON CRAMON-TAUBADEL (1998) demonstrated that the Woffram-Houck type specifications are fundamentally inconsistent with cointegration and proposed an error correction model of the form:

$$\Delta P_t^R = \alpha + \sum_{j=1}^K (\beta_j^+ D^+ \Delta P_{t-j+1}^P) + \sum_{j=1}^L (\beta_j^- D^- \Delta P_{t-j+1}^P) + \phi^+ ECT_{t-1}^+ + \phi^- ECT_{t-1}^- + \Delta P_{t-1}^R + \Delta P_{t-2}^R + \dots + \Delta P_{t-p}^R + \gamma_t \tag{10}$$

ECT_{t-1}^+ and ECT_{t-1}^- are the segmented error correction terms resulting from the long-run (cointegration) relationship:

$$ECT_{t-1} = \mu_{t-1} = P_{t-1}^R - \alpha_0 - \alpha_1 P_{t-1}^P ; \alpha_0 \text{ and } \alpha_1 \text{ are coefficients} \tag{11}$$

and,

$$ECT_{t-1} = ECT_{t-1}^+ + ECT_{t-1}^- \tag{12}$$

Using an VECM representation as in (10), both the short-run and the long-run symmetry hypothesis can be tested using standard tests. Valid inference requires one price to be weakly exogenous in both the long- and short-run with respect to the parameters in (10). We have presented the long-run exogeneity tests when discussed the interpretation of the α , the speed of adjustment vector. Following BOSWIJK and URBAIN (1997) we test for the short-run exogeneity by estimating the marginal model (13), then perform a variable addition test of the fitted residuals \hat{v}_t from (13) into the structural model, (10):

$$\Delta P_t^F = \psi_0 + \psi_1(L) \Delta P_{t-1}^R + \psi_2(L) \Delta P_{t-1}^F + v_t \tag{13}$$

For a more detailed discussion of exogeneity conditions in VECM see VON CRAMON-TAUBADEL, 1998.

5 DATA AND RESULTS

Monthly (January 1992-December 2002) farm-gate and producer prices were used, resulting in 132 observations. Farm-gate prices are represented by the monthly average nominal market price of live pigs and porkers for slaughter in Hungarian Forint (HUF) per kilogram.

The Hungarian Central Statistical Office supplied all price data. Liveweight prices were transformed to slaughter weight prices using a 0.72 conversion factor. Two retail price data series, RP1¹ and RP2² were constructed as the weighted average of different meat cuts. All data were deflated to January 1992 prices, using the monthly Hungarian Consumer Price Index (CPI).

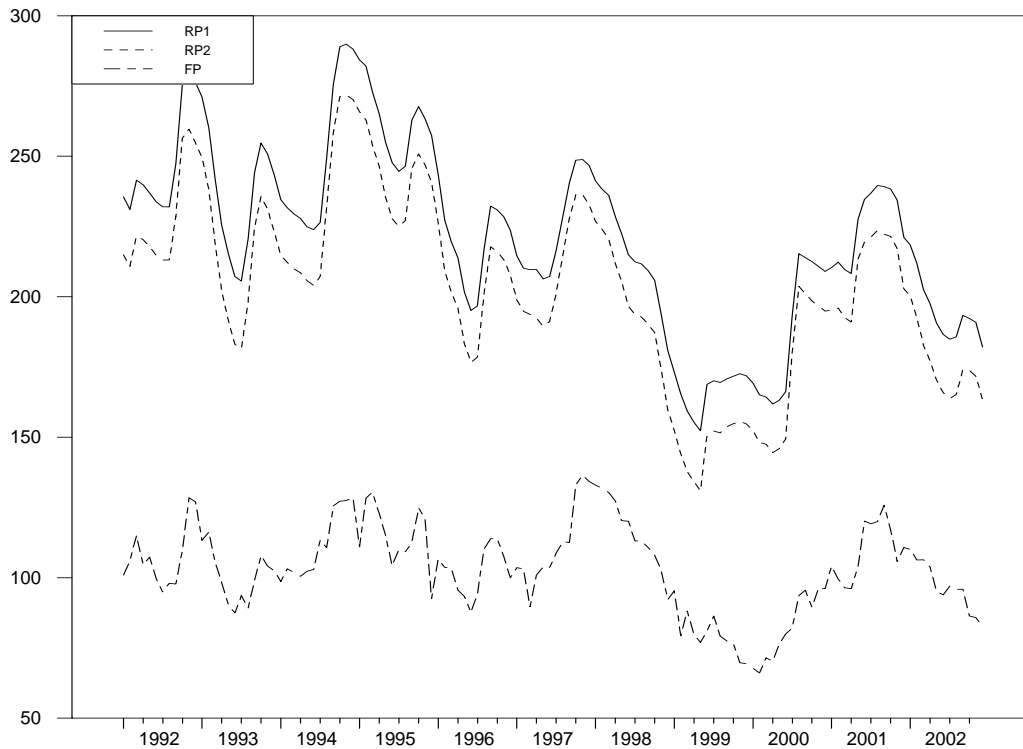
Pork prices have exhibited large fluctuations over the last 10 years, especially during the 1992-1996 time period (Figure 1).

¹ RP1= Pork with bones*0.45 + Pork without bones*0.40+ Rolled ham*0.05 + Dry sausage*0.05 +Bologna and casserole sausage*0.05.

² RP2= (price of pork chops with bones +price of spare rib with bones+ price of pork belly with bones +price of pork leg without bones)/4.

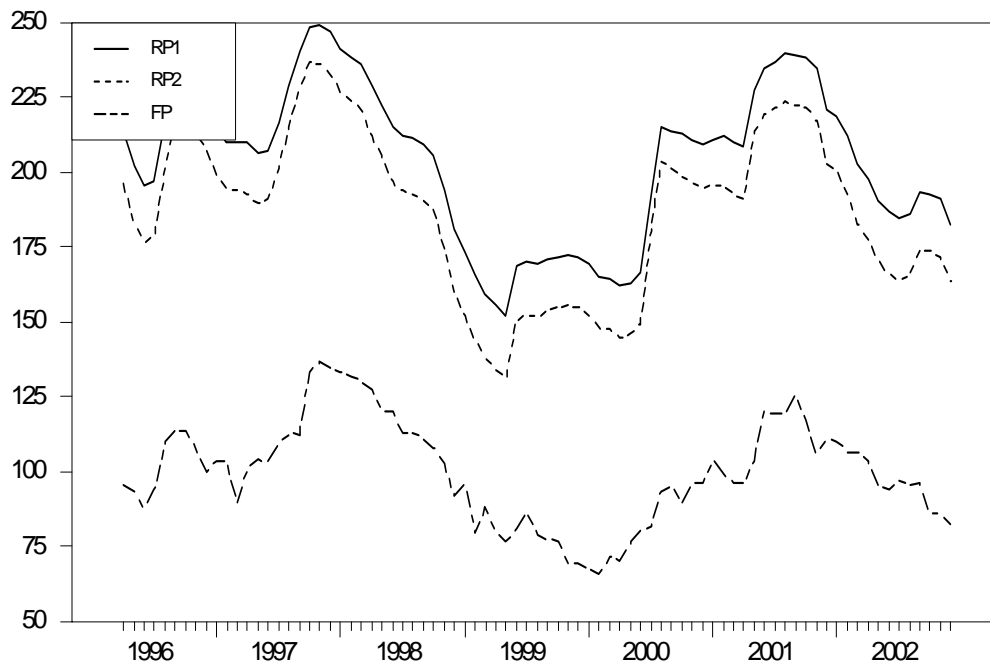
From January 1996 to December 2002 the series are characterised by a much more stable evolution (Figure 2).

Figure 1: Monthly real farm-gate and retail prices in HUF/kg



Source: Author's own calculations, data supplied by the CENTRAL STATISTICAL INSTITUTE.

Figure 2: Monthly real farm-gate and retail prices in HUF/kg



Source: Author's own calculations, data supplied by the CENTRAL STATISTICAL INSTITUTE.

5.1 Stationarity and integration tests

Unit roots were tested in two retail and one farm gate price series using the ADF procedure. The test results are presented in Table 1.

Table 1: Unit root test results

| 1992-2002 period | Lags | FP | Lags | RP1 | Lags | RP2 |
|----------------------|------|---------|------|----------|------|-----------|
| With constant | 0 | -2.5887 | 2 | -2.4108 | 1 | -3.3360** |
| With cons. and trend | 0 | -2.8310 | 2 | -3.2214* | 1 | -4.4023** |
| 1996-2002 period | Lags | FP | Lags | RP1 | Lags | RP2 |
| With constant | 0 | -1.6471 | 1 | -2.5950* | 1 | -2.6270* |
| With cons. and trend | 0 | -1.8289 | 1 | -2.7216 | 1 | -2.7559 |

Notes: ** Denote a 0.90 and 0.95 significance level, respectively. Critical values on a 0.90 (0.95) significance level, ADF tests with a constant are -2.57 (-2.88), and with a trend are -3.13 (-3.43). Lags are selected by the SBC criteria.

The tests indicate that the farm prices are I(1), but the retail price series are stationary at a 0.95 significance level (RP2) or trend stationary at a 0.90 significance level (RP1). Because the 1992-1996 time period appears to exhibit greater fluctuation than the 1996-2002 time period (see Figure 2), the tests were repeated for the 1996-2002 time period. All series except RP2 (which appears to be stationary at a 0.90 significance level) are integrated by the order of one. Therefore, it was concluded that all three series contain unit roots. Hereafter, only the January 1996 to December 2002 time period is dealt with.

We now proceed to the cointegration analysis and find one cointegrating vector for each pair of prices. The results of the cointegration analysis are presented in Table 2.

Table 2: Cointegration analysis

| Model | Lags | Trace ($H_0: r > 0$ and $r > 1$) | L-max ($H_0: r > 0$ and $r > 1$) | Cointegration vector (normalised form) | | | |
|--------|------|--|--|---|------|--------|----------|
| | | | | RP1 | RP2 | FP | Constant |
| FP-RP1 | 3 | 18.84* 6.93 | 11.91* 6.93 | 1.00 | – | -1.363 | -68.527 |
| FP-RP2 | 3 | 20.79* 7.78 | 13.01* 7.78 | – | 1.00 | -1.419 | -46.256 |

Note: * Denote a 0.90 significance level. 11 centered seasonal dummies included.

As expected, both the trace and Lambda-max statistics choose one cointegration vector, and there is no evidence of serial autocorrelation in the residuals (Table 3). The farm gate – retail price relationship can be written as:

$$RP1 = 68.527 + 1.363*FP \quad (14)$$

$$RP2 = 46.256 + 1.419*FP \quad (15)$$

At this stage, the results indicate that marketing margin on the pork market is made up of an absolute amount and a mark-up of the retail price. Using the

notation introduced in equation (2), $a = 93.54$ and $b = 0.266$ for equation (14), and $a = 65.704$ and $b = 0.295$ for equations (15).

Table 3: Tests on the residuals

| Model | Ljung-Box(20) p-value | LM(1) p-value | LM(4) p-value | Normality p-value |
|--------|--------------------------|------------------|------------------|----------------------|
| FP-RP1 | 0.69 | 0.77 | 0.72 | 0.00* |
| FP-RP2 | 0.64 | 0.81 | 0.63 | 0.00* |

Note: * Non-normality – implies that the test results must be interpreted with care, although asymptotic results do hold for a wider class of distributions (VON CRAMON-TAUBADEL, 1998).

5.2 Exogeneity and price spread analysis

The factor-loading matrix in Table 4 measures the speed of adjustment of the variables towards the long-run equilibrium.

The α parameters have positive signs, and those associated to the farm gate prices are larger than those associated with retail prices. This suggests that the farm gate prices react more intensively to unanticipated shocks than do the retail prices. However, their magnitude (0.191-0.201) is small, suggesting a rather moderate intensity of price adjustment when unexpected shocks occur. None of the α values associated with retail prices was statistically significant at conventional levels.

Table 4: Factor loading matrix (α)

| Model | Variable | α | t-value |
|--------|----------|----------|---------|
| FP-RP1 | FP | 0.201 | 3.490* |
| | RP1 | 0.036 | 0.550 |
| FP-RP2 | FP | 0.191 | 3.708* |
| | RP2 | 0.047 | 0.721 |

Note: * Denote a 0.95 significance level.

Table 5: Weak exogeneity tests

| Model | Variable | Exogeneity test | Likelihood Ratio statistics | p-value |
|--------|----------|--------------------|-----------------------------|---------|
| FP-RP1 | FP | $\alpha_{FP} = 0$ | $\chi^2(1)=4.75$ | 0.03 |
| | RP1 | $\alpha_{RP1} = 0$ | $\chi^2(1)=0.13$ | 0.72 |
| FP-RP2 | FP | $\alpha_{FP} = 0$ | $\chi^2(1)=5.12$ | 0.02 |
| | RP2 | $\alpha_{RP2} = 0$ | $\chi^2(1)=0.22$ | 0.64 |

Weak exogeneity tests show that in both models the retail prices (RP1, RP2) are weakly exogenous in the long-run, and that farm gate prices react to changes in retail prices. Price changes were mainly due to retail side factors, as only the farm gate price responds to deviations from the long-run equilibrium. Thus, there is a long-run unidirectional Granger causality from retail to producer price. The statistical properties can be improved if the models are re-estimated as partial models,

where the retail prices enter the model as weakly exogenous variables. Table 6 presents the re-estimated cointegration models, normalised to the farm prices and some diagnostic tests on the residuals.

Table 6: Re-estimated models

| Model | RP1 | RP2 | FP | Const. | LB(20) p-value | LM(1) p-value | LM(4) p-value | Norm. p-value |
|--------|-------|-------|------|--------|-------------------|------------------|------------------|------------------|
| FP-RP1 | -0.77 | - | 1.00 | 58.15 | 0.64 | 0.73 | 0.68 | 0.00* |
| FP-RP2 | - | -0.75 | 1.00 | 42.45 | 0.57 | 0.78 | 0.58 | 0.00* |

Note: * Non-normality – Implies that the test results must be interpreted with care, although asymptotic results do hold for a wider class of distributions (VON CRAMON- TAUBADEL, 1998).

Thus, the long run price relation between the farm-gate price and the two retail prices for the January 1996 to December 2002 period are:

$$FP = - 58.158 + 0.773*RP1 \quad (16)$$

$$FP = - 42.454 + 0.759*RP2 \quad (17)$$

The results of the structural tests are presented in Table 7.

Table 7: Structural tests – Restrictions on β vectors

| Model | Test | RP1 | RP2 | FP | Constant | p-value |
|--------|------------------------------|-----|-----|----|----------|---------|
| FP-RP1 | $\beta_{RP1} = - \beta_{FP}$ | -1 | - | 1 | 104.35 | 0.34 |
| FP-RP2 | $\beta_{RP2} = - \beta_{FP}$ | - | -1 | 1 | 87.571 | 0.32 |

The null of a competitive pricing process cannot be rejected. This means that the marketing margin in the pork market is a constant absolute margin.

The producer-retail price relationship can be reformulated as:

$$FP = -104.35 + RP1 \quad (18)$$

$$FP = -87.571 + RP2 \quad (19)$$

In relation to equations (2) and (4), the results indicate that the mark-up, b , is zero, suggesting perfect competition on the Hungarian pork market.

5.3 Price transmission analysis

The residuals of (18) and (19) are saved and segmented into negative and positive phases. The first differences of the retail prices are also split into negative and positive sections as follows: $\Delta RP1M$, $\Delta RP1P$, $\Delta RP2M$, $\Delta RP2P$. The transformed equation (10) was first estimated with 4 lags, and then reduced to more parsimonious models. The marginal models (13), not shown here, were also estimated, and the fitted residuals \hat{v}_t saved. Table 8 and 9 present the regression estimates, symmetry tests and some diagnostic tests. The two models are well-specified, and there are no traces of serial autocorrelation of order 1, 4, and 12. The Ljung-Box Q statistic does not reject the null hypothesis of no serial correlation amongst the

first 20 residuals. The Chow test does not reject the stable parameters null hypothesis and there is no evidence of homoskedasticity or the use of a wrong functional form. The residuals are non-normal, which implies that the test results must be interpreted with care, although asymptotic results do hold for a wider class of distributions (VON CRAMON-TAUBADEL, 1998). The variable addition tests indicate that the marginal equations' residuals are not significant in the models, therefore the null hypothesis that the retail prices are weakly exogenous with respect to the short-run parameters too, cannot be rejected. The error correction terms (ECTP and ECTM) have the right sign, and ECTM causes a greater change in the farm price than ECTP. However, the F-test of long-run symmetry null hypotheses cannot be rejected ($p = 0.804$ and $p = 0.857$ respectively), suggesting price transmission symmetry. The short-run symmetry hypotheses are then tested using an F-test and the nulls of symmetry cannot be rejected in this case either ($p = 0.641$ and $p = 0.689$, respectively).

Table 8: Symmetry tests: FP – RP1 model, dependent variable ΔFP

| Independent variables | Coefficients | T-stat. | Significance (p-value) |
|---|-------------------------|----------------------|------------------------|
| $\Delta RP1M_t$ | 0.763 | 4.235 | 0.00006 |
| $\Delta RP1P_t$ | 0.371 | 3.335 | 0.00135 |
| $\Delta RP1P_{t-1}$ | 0.437 | 3.547 | 0.00069 |
| ΔFP_{t-1} | -0.478 | -4.104 | 0.00010 |
| ΔFP_{t-2} | -0.224 | -2.295 | 0.02468 |
| $ECT1P_{t-1}$ | -0.147 | -2.121 | 0.03737 |
| $ECT1M_{t-1}$ | -0.176 | -2.134 | 0.03623 |
| Specification and diagnostic tests | | | |
| | Test | Test statistic | Significance (p-value) |
| Adjusted R^2 | $\overline{R^2}$ | 0.387 | – |
| Autocorrelation | LM(1) | $F(1.68) = 0.000$ | 0.97548 |
| | LM(4) | $F(4.62) = 1.347$ | 0.26238 |
| | LM(12) | $F(12.46) = 1.002$ | 0.46215 |
| | Ljung – Box Q statistic | $Q(20) = 16.894$ | 0.65982 |
| Parameter stability | CHOW | $F(64.7) = 0.649$ | 0.82987 |
| Normality | Jarque-Bera | $\chi^2(2) = 1.644$ | 0.43942 |
| Heteroskedasticity | WHITE | $\chi^2(35) = 31.12$ | 0.65596 |
| Functional form | RESET | $F(1.70) = 0.074$ | 0.7861 |
| Variable addition test (the marginal model residuals) | WALD | $F(1.69) = 1.76$ | 0.18894 |
| Asymmetry tests | | | |
| Long-run symmetry | WALD | $F(1.71) = 0.061$ | 0.80473 |
| Short-run symmetry | WALD | $F(1.72) = 0.218$ | 0.64158 |

Table 9: Symmetry tests: FP – RP2 model, dependent variable ΔFP

| Independent variables | Coefficients | T-stat. | Significance (p-value) |
|--|-------------------------|----------------------|------------------------|
| $\Delta RP2M_t$ | 0.686 | 4.1 | 0.00010 |
| $\Delta RP2P_t$ | 0.320 | 3.257 | 0.00172 |
| $\Delta RP2P_{t-1}$ | 0.407 | 3.751 | 0.00035 |
| ΔFP_{t-1} | -0.474 | -4.076 | 0.00011 |
| ΔFP_{t-2} | -0.213 | -2.194 | 0.03145 |
| $ECT2P_{t-1}$ | -0.14 | -2.328 | 0.02274 |
| $ECT2M_{t-1}$ | -0.158 | -2.163 | 0.03386 |
| Specification and diagnostic tests | | | |
| | Test | Test statistic | Significance (p-value) |
| Adjusted R ² | $\overline{R^2}$ | 0.384 | – |
| Autocorrelation | LM(1) | F(1.68) = 0.002 | 0.95723 |
| | LM(4) | F(4.62) = 1.559 | 0.19626 |
| | LM(12) | F(12.46) = 1.255 | 0.27678 |
| | Ljung – Box Q statistic | Q(20) = 17.427 | 0.62509 |
| Parameter stability | CHOW | F(64.7) = 0.71 | 0.78209 |
| Normality | Jarque-Bera | $\chi^2(2) = 1.526$ | 0.4662 |
| Heteroskedasticity | WHITE | $\chi^2(35) = 34.39$ | 0.49734 |
| Functional form | RESET | F(1.70) = 0.046 | 0.83048 |
| Variable addition test (the residuals of the marginal) | WALD | F(1.69) = 1.32 | 0.25451 |
| Asymmetry tests | | | |
| Long-run symmetry | WALD | F(1.71) = 0.032 | 0.85741 |
| Short-run symmetry | WALD | F(1.72) = 0.161 | 0.68905 |

6 CONCLUSIONS

Along with many empirical studies of livestock markets in developed countries, we have examined how retail price is formed and how price transmission works in a transition country's livestock market. We analysed the long-run relationship between two retail prices and the farm-gate price for pork in Hungary. Vertical price transmission was analysed in the cointegration framework, using Johansen's maximum likelihood approach. Because of the highly volatile 1992-1996 time period, we split our data in two, and carried out the research on the more settled 1996-2002 data set. Results indicate that retail and farm gate prices in the Hungarian pork market move together in the long run, that is, they are cointegrated for the January 1996 to December 2002 time period. The exogeneity tests found the retail prices were weakly exogenous in both the long- and short-run and established a unidirectional long-run Granger causality from retail to producer prices. Prices are set on the retail market and the retailers make 'offers' to producers

further down the marketing chain. Our causality findings are in line with those of DAWSON and TIFFIN (2000) on the British lamb market, who established a unidirectional retail-to-producer price Granger causality. Structural tests found that there is a constant absolute margin linking the retail and producer prices, indicating the existence of a competitive processing and retailing market. The existence of a constant absolute margin, and thus the hypothesis of a competitive pork market, concur with BOJNEC (2002) who studied marketing margins on the Slovenian pork market. These results suggest that even the less-developed markets in transition economies can perform as competitive markets. However, we conclude that on the Hungarian pork market, farm prices react to changes in retail prices. We carried out both short- and long-run asymmetry tests, and, contrary to popular belief, we found that the null of symmetrical price transmission cannot be rejected in either case. This result contradicts the findings of studies set in developed markets, which usually establish asymmetrical price transmission on livestock markets and farms to a wholesale to retail price information flow.

In the present study, the price series used for the analysis were deflated by the CPI. It can be argued that the strong inflationary environment that characterised the Hungarian economy in the 1990s cannot be simply neglected when analysing price transmission. Future research on the topic could be an extension of the present analysis to include the effect of inflation in the model, and thus capture any impact on price transmission.

REFERENCES

- ABDULAI, A. (2002): Using threshold cointegration to estimate asymmetric price transmission in the Swiss pork market, *Applied Economics*, Vol. 34, pp. 679-687.
- BEN-KAABIA, M., GILL, J. M., BOSHNJAKU, L. (2002): Price transmission asymmetries in the Spanish lamb sector, Paper presented at the X. Congress of European Association of Agricultural Economists, Zaragoza/Spain, 28.-31.08.2002.
- BOJNEC, S. (2002): Price transmission and marketing margins in the Slovenian beef and pork markets during transition, Paper presented at the X. Congress of European Association of Agricultural Economists, Zaragoza/Spain, 28.-31.08.2002.
- BOSWIJK, H. P., URBAIN, J. P. (1997): Lagrange-multiplier tests for weak exogeneity: A synthesis, *Econometric Reviews*, Vol. 16, pp. 21-38.
- DAWSON, P. J., TIFFIN, R. (2000): Structural breaks, cointegration and the farm-retail price spread for lamb, *Applied Economics*, Vol. 32, pp. 1281-1286.
- DICKEY, D. A., FULLER, W. A. (1979): Distributions of the estimators for autoregressive time series with a unit root, *Journal of the American Statistical Association*, Vol. 75, pp. 427-431.
- DICKEY, D. A., FULLER, W. A. (1981): Likelihood ratio statistics for autoregressive time series with a unit root, *Econometrica*, Vol. 49, pp. 1057-1072.
- ENGLE, R. F., GRANGER, C. W. J. (1987): Cointegration and error correction: Representation, estimation and testing, *Econometrica*, Vol. 55, pp. 251-276.

- GRANGER, C. W. J. (1969): Investigating casual relations by econometric methods and cross-spectral methods, *Econometrica*, Vol. 37, pp. 24-36.
- GOODWIN, B. K., HARPER, D. C. (2000): Price transmission, threshold behaviour, and asymmetric adjustment in the U.S. pork sector, *Journal of Agricultural and Applied Economics*, Vol. 32, pp. 543-553.
- GOODWIN, B. K., Holt, M. T. (1999): Price transmission and asymmetric adjustment in the U.S. beef sector, *American Journal of Agricultural Economics*, Vol. 81, pp. 630-637.
- Guba, F. Z. (2001): Transzferek és hatékonyságzavarok az élelmiszer-termékpályákon, *Közgazdasági Szemle*, Vol. 48, pp. 44-62.
- HARRIS, R. I. D. (1995): Using cointegration analysis in econometric modelling, Prentice Hall/Harvester Wheatsheaf.
- HOUCK, J. P. (1977): An approach to specifying and estimating non-reversible functions, *American Journal of Agricultural Economics*, Vol. 59, pp. 570-572.
- JANSIK, C. S. (2000): Determinants and influence of foreign direct investments in the Hungarian food industry in a Central and Eastern European context, *Agri-food Research Finland Economic Research (MTTL) Publications 102*.
- JOHANSEN, S. (1988): Statistical analysis of cointegrating vectors, *Journal of Economic Dynamics and Control*, Vol. 12, pp. 231-254.
- MILLER, J. D., HAYENGA, M. L. (2001): Price cycles and asymmetric price transmission in the U.S. pork market, *American Journal of Agricultural Economics*, Vol. 83, pp. 551-561.
- NELSON, C. R., PLOSSER, C. I. (1982): Trends and random walks in macroeconomic time series, *Journal of Monetary Economics*, Vol. 10, pp. 139-162.
- PELTZMAN, S. (2000): Prices rise faster than they fall, *Journal of Political Economy*, Vol. 108, pp. 466-502.
- REZITIS, A. (2003): Mean and volatility spillover effects in Greek producer-consumer meat prices, *Applied Economics Letters*, Vol. 10, pp. 381-384.
- VON CRAMON-TAUBADEL, S. (1998): Estimating asymmetric price transmission with the error correction representation: An application to the German pork market, *European Review of Agricultural Economics*, Vol. 25, pp. 1-18.
- WARD, R. W. (1982): Asymmetry in retail, wholesale, and shipping point pricing for fresh vegetables, *American Journal of Agricultural Economics*, Vol. 64, pp. 205-212.
- WOLFFRAM, R. (1971): Positivistic measures of aggregate supply elasticities: Some new approaches – Some critical notes, *American Journal of Agricultural Economics*, Vol. 31, pp. 356-359.

SLOVENIAN RETAILING MARKET STRUCTURES, RETAIL PRICES, AND SIZE OF MARKETING MARGINS FOR FOOD STAPLES

*ŠTEFAN BOJNEC**

ABSTRACT

The paper analyses changes in the Slovenian retailing sector, focusing on agricultural and food products during transition and the adjustments undertaken while working towards European Union (EU) membership. Market structures are analysed by considering the patterns in marketing type characteristics. Non-specialized stores, predominantly food stores or supermarkets, are the most important for retail trade in agricultural and food products. The patterns in marketing margins for food staples are analysed through developments in real farm-gate and real retail prices for the main food chains. Among analysed food marketing chains, the diverging patterns between real farm-gate price declines and real retail price stability or its increases – and thus the increase in the farm-gate to retail-price spread – are confirmed for the following marketing chains: Wheat-flour-bread, cattle-beef, and to a lesser extent for sugar beet-sugar and pigs-pork. The milk-dairy marketing chain experienced real price increases until 1998-1999, but reductions thereafter. The real farm-gate and real retail prices tend to decline for sugar beet-sugar and eggs-chicken, and to a lesser extent for wine grapes-wine marketing chains. Further price adjustments have occurred since Slovenia became an EU member.

Keywords: *Market structures, farm-gate and retail prices, marketing margin, Slovenia.*

* Dr. Štefan Bojnec, Associate Professor of Economics, Turistica – College of Tourism Portorož (Email: stefan.bojnec@turistica.si) and Faculty of Management Koper (Email: stefan.bojnec@fm-kp.si), University of Primorska, Slovenia.

1 INTRODUCTION

The food market chains in Central and Eastern European (CEE) countries have considerably changed during transition to a market economy (HARTMANN and WANDEL, 1999). During the previous economic system, most CEE countries experienced shortages of several products, including diversified food products (e.g. KORNAI, 1992). Under government control were prices and marketing margins of several agricultural and food products. Since the collapse of the previous system, agricultural and food markets have experienced liberalization and deregulation, which has led to quality improvements as a result of food importation, restructuring in the agriculture and food sectors, and restructuring in the trade and retailing sector with the increasing role of supermarkets (DRIES et al., 2004; REARDON and SWINNEN, 2004).

Competition policy, privatisation and deregulation have been the key elements in changing the business environment at the micro- and macro-economic levels. For various reasons, in the initial market structures in CEE countries, a monopolistic position and market power were considerable constraints to market and business efficiency. The economic literature argues that there are static and dynamic benefits from competition (e.g. CHRYSTAL and LIPSEY, 1997; MCALEESE, 2004). Among static benefits are greater output at the market for consumers, at lower costs and lower prices, which reduces or eliminates deadweight loss. Among dynamic benefits, there are at least three efficiency gains: Making firms more cost efficient; allowing more efficient firms to expand and inefficient firms to exit through the market selection process, and; providing incentives for innovation. Besides static and dynamic efficiency improvements, there is also the equity consideration, where small competitors such as small farmers, suppliers of inputs and consumers are protected from the abuse of monopolistic power.

This paper presents developments in the Slovenian retailing market structures, real farm-gate price and real retail price developments for the main agricultural and food marketing chains. Patterns in real price developments at the farm-gate and retail level indicate the size of marketing margins for the main food chains. In the initial phase of transition, the retail sector in most CEE countries, including Slovenia, was relatively less competitive than in the neighbouring EU countries due to rather limited varieties of goods and retail services at relatively high retail prices. Therefore, lack of costs, quality, and price competitiveness in CEE countries was possible to notice when purchasing products in neighbouring EU countries (for example, in Austria and Italy). While in the past, retail shops were largely concentrated in town centres and residential areas, another change during recent years has been the establishment of new supermarkets in the suburbs for customers buying in a larger quantity, usually for a whole week, and coming by car.

In the initial phase of transition, there was the typical entry of small-scale private shops to fulfil market niches. However, small shops that have not been able to

organise prompt delivery of high quality products at reasonable prices are losing market share. Since the mid-1990s, there have been shifts in retail market structures, with fewer new entries of small shops, but more mergers and the concentration of retail sales outlets through the entry of supermarkets. In Slovenia, some supermarkets were present in the past and until the second half of the 1990s, most retailing activities were conducted within the Slovenian retailing shops and supermarkets. During the initial stage of transition, the largest Slovenian retailers tried to carry out efficient reorganisation of retail shops to gain some of the advantages presented by western-style trade chains and supermarkets. This has been sped up through an intense process of mergers and take-overs by the largest Slovenian retailer, Mercator, to rationalise cost structures using economies of scale. Take-overs and mergers between retail trade organisations were seen as a way to create stronger and more competitive domestic retailing. Since the mid-1990s, Mercator has set up western-style supermarkets outside of Slovenia, in the largest cities of the former Yugoslav republics. On the other hand, some foreign supermarket chains, particularly the Austrian firm Spar/Interspar, have entered the Slovenian retailing structure.

The trade and retailing sector in Slovenia are important for job creation, but also for rationalisation in the production, processing and marketing chains. During recent years, competitive pressures in the markets have increased. There are some real retail price reductions, such as in the milk and dairy chains. For some main agricultural and food products, consumer prices in Slovenia were higher than in most other CEE countries, and for some products even higher than in some EU countries (EUROPEAN COMMISSION, 2004). The increased competitive pressures on the reduction of producers and/or processors margins and prices within the marketing chains therefore create pressures on efficiency improvements and cost reductions. Domestic retailers and supermarkets have tried to imitate some developments typical of Western economies in terms of retail shops location, size, operation and management. With the Slovenian negotiation and adjustment to EU membership, Slovenian retailing markets have been gradually liberalised, allowing easier entry into the Slovenian retailing markets. The increased competitive pressures in the supermarket chains created pressures on the rationalisation and efficiency improvements of introducing measures for greater competitiveness, such as more advanced food quality regulations, food standards, packaging and marketing approaches.¹ Under these increasing competitive pressures, the retailing sector has been growing

¹ An inflow of foreign retail chains in CEE countries started in Hungary (e.g., by "Tesco" and some others supermarket chains), the Czech Republic, Poland, and later in other CEE countries particularly bordering the EU countries as well as in some largest CEE cities (e.g. Moscow and St. Petersburg). They have been set in different ways as foreign direct investments (FDIs), joint ventures with domestic chains, and even as domestically owned retail chains (see also DRIES et al., 2004; REARDON and SWINNEN, 2004).

more efficient. Since the mid-1990s, domestic and foreign-owned food chains have largely tried to increase efficiency through the rationalisation of retailing with a diversification of supply and new products, new ways of purchasing products (particularly the rationalisation of the trade margin by using economies of scale with substantial reduction of labour and some other operational and marketing costs) and new ways of doing business, for example by building new, large shops in the suburbs. During the most recent years, few foreign retailing chains have entered the Slovenian retailing markets. The increased competitive pressures in trade have impacts on farm and consumer prices, marketing margins, the redistribution of rents and welfare implications for producers, traders and consumers.

2 MARKETING OF AGRICULTURAL PRODUCTS

The marketing of agricultural products during transition has changed, as several agricultural purchasing organizations collapsed or were rationalized to reduce the costs of intermediation. The food processing and distribution sectors in CEE countries have largely been efficiently improved (HARTMANN and WANDEL, 1999).

During the previous system in the 1980s, the prevailing private agricultural households in Slovenian agriculture sold the major part of their directly marketed agricultural production through agricultural cooperatives and socially-owned enterprises, usually based on contracts. From 1980-1985, about 75 percent of the agricultural products sold by private agricultural households were sold through agricultural organizations, about 7.3 percent through trade and industrial organizations, and about 17.7 percent through forest organizations. On the other hand, the socially owned farms were a part of the vertically integrated regional monopolistic organizations for food processing, wholesale and retail trade (BOJNEC, 1994).

The structure of marketing agricultural products changed during the 1990s. In 2003, milk and dairy products, livestock, poultry and eggs accounted for around 72 percent of the value of purchased agricultural products in Slovenia (Table 1). This clearly reveals the significance of livestock-based agricultural production in Slovenia. Milk and dairy products are the most important single product group in terms of the value of sold agricultural products through different marketing channels, particularly through dairies. The importance of livestock in the value of purchased agricultural products increased until the mid-1990s, with a slight reduction thereafter. The significance of poultry and eggs has tended to decline as well. Cereals and industrial plants account for less than 7 percent of the value of directly marketed agricultural production, while vegetables account for less than 2 percent; vegetables also comprise less than 6 percent of the value of purchased agricultural products.

Table 1: Value of purchased agricultural products (million current SIT¹)

| | 1990 | % | 1995 | % | 2000 | % | 2003 | % |
|-------------------------|-------|-------|--------|-------|--------|-------|---------|-------|
| TOTAL | 7,377 | 100.0 | 65,103 | 100.0 | 88,851 | 100.0 | 103,311 | 100.0 |
| Livestock | 2,039 | 27.6 | 19,031 | 29.2 | 23,563 | 26.5 | 23,404 | 22.7 |
| Poultry and eggs | 1,862 | 25.2 | 12,504 | 19.2 | 14,706 | 16.6 | 19,451 | 18.8 |
| Milk and dairy products | 1,257 | 17.0 | 15,446 | 23.7 | 26,047 | 29.3 | 31,417 | 30.4 |
| Hides and wool | 22 | 0.3 | 79 | 0.1 | 33 | 0.0 | 1,093 | 1.1 |
| Cereals | 337 | 4.6 | 3,364 | 5.2 | 4,048 | 4.6 | 3,710 | 3.6 |
| Industrial plants | 268 | 3.6 | 2,719 | 4.2 | 3,328 | 3.7 | 3,175 | 3.1 |
| Fodder plants | 4 | 0.1 | 43 | 0.1 | 40 | 0.0 | 64 | 0.1 |
| Vegetables | 158 | 2.1 | 681 | 1.0 | 1,098 | 1.2 | 1,897 | 1.8 |
| Fruits ²⁾ | 433 | 5.9 | 2,584 | 4.0 | 5,346 | 6.0 | 5,497 | 5.3 |
| Alcoholic drinks | 360 | 4.9 | 3,970 | 6.1 | 5,088 | 5.7 | 5,951 | 5.8 |
| Wood ³⁾ | 458 | 6.2 | 3,256 | 5.0 | 4,121 | 4.6 | 5,085 | 4.9 |
| Fishes | 52 | 0.7 | 400 | 0.6 | 445 | 0.5 | 663 | 0.6 |
| Other products | 127 | 1.7 | 1,026 | 1.6 | 988 | 1.1 | 1,904 | 1.8 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, various issues.

Notes: ¹⁾ For 1990, in Dinars.

²⁾ Fruit for industry included.

³⁾ Purchase of wood from private forests bought via co-operatives and forest management organisations.

3 FOOD RETAILING

With liberalization, privatisation and restructuring in CEE countries, agricultural and food marketing channels have developed a greater trading role for supermarkets (DRIES et al., 2004; REARDON and SWINNEN, 2004), and similar changes have been observed in Slovenia. The local peasant markets and the free-markets existed in the cities, and the value and quantities marketed at these places were not very significant (BOJNEC and MÜNCH, 2000). More competitive retailers and supermarkets are increasing their shares in the food marketing channels.

The value of agricultural and food products sold through newly-emerging marketing and retailing channels has been increasing. Food, alcoholic and non-alcoholic beverages, and tobacco and tobacco products account for 30 percent of the total retail trade in Slovenia, while the specialized retail trade shops with food represents 36.3 percent of the total retail trade (Table 2). More than 94 percent of food is traded in the retail trade shops specialising in food. Most alcoholic and non-alcoholic beverages and tobacco and tobacco products are also traded in these shops. This suggests a rather high specialization of the retail food trade, as well as beverages and tobacco products within the retail shops and supermarkets.

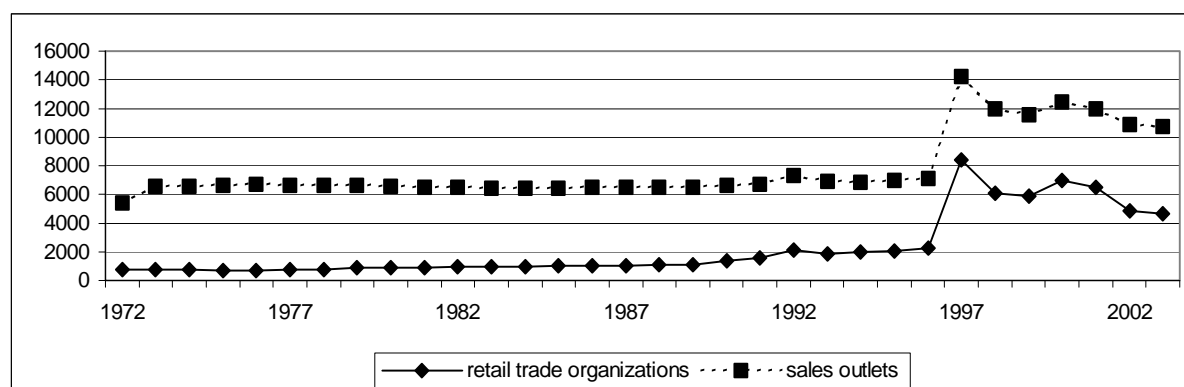
Table 2: Turnover including value added tax in retail trade activities, 2003 (million SIT)

| | Value by groups of retail trade activities | | | |
|------------------------------|--|-------|------------------------|-------------------------|
| | Total retail trade | % | Retail trade with food | % of total retail trade |
| TOTAL TRADE | 2,184,739 | 100.0 | 793,449 | 36.3 |
| Food | 449,092 | 20.6 | 423,144 | 94.2 |
| Non-alcoholic beverages | 81,831 | 3.7 | 75,654 | 92.5 |
| Alcoholic beverages | 63,553 | 2.9 | 58,191 | 91.6 |
| Tobacco and tobacco products | 61,510 | 2.8 | 37,784 | 61.4 |
| Other products | 1,528,753 | 70.0 | 198,676 | 13.0 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, 2004.

Note: The data were collected with a sample and grossed to the total observed activity.

The number of retail trade organizations and sales outlets in Slovenia has increased steadily, aside from the sharp increase in 1997 (Figure 1), which is biased to statistical data changes. Between 1993 and 1996, evidence included only enterprises with at least two persons in paid employment, while evidence between 1997 and 2003 was collected by the Statistical Office of the Republic of Slovenia (SORS) with a sample and adjusted to the total observed activity. Due to the changes in weighting methodology in 2000, and the comparability of the series, the evidence for 1997-1999 was revised by the SORS.

Figure 1: Organizations and sales outlets in retail trade in Slovenia, 1972-2003

Source: Data is taken from SORS, 2004.

As illustrated in Figure 1, the number of retail organizations and sales outlets declined beginning in 1997, and then experienced an increase in 2000; since then, however, they have further concentrated, which has led to decline.

Table 3 analyses the decline in more detail. In 2000, 28.5 percent of retail enterprises and other organizations in retail activities were engaged in retail trade with food, beverages and tobacco products, while 37.2 percent were in 2003. Their increase in relative importance occurred irrespective of the absolute decline in the

number of retail trade organizations with food, beverages and tobacco products. Within the retail trade of food, beverages and tobacco products, in 2000, around 76 percent of organizations were non-specialized stores with predominantly food, with 22.5 percent specialized stores for food and beverages, and 1.6 percent specialized stores for tobacco products. The most recent tendency is the increase in the absolute number, and thus the increase in the relative importance of specialized stores for food and beverages and the reduction in both absolute and relative importance of the prevailing non-specialized stores, predominantly with food, and to a lesser extent specialized stores for tobacco products.

Table 3: Enterprises and other organisations by retail activity

| | 2000 | % | 2003 | % |
|---|-------|-------|-------|-------|
| TOTAL | 6,993 | | 4,674 | |
| Retail trade with food, beverages, tobacco | 1,996 | 100.0 | 1,738 | 100.0 |
| Food and beverages (specialized stores) | 450 | 22.5 | 481 | 27.7 |
| Tobacco (specialized stores) | 32 | 1.6 | 22 | 1.3 |
| Non-specialized stores, predominantly with food | 1,514 | 75.9 | 1,235 | 71.1 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, 2004.

There are some similarities, but also differences, between patterns in the development of retail organizations and retail sales outlets (Figure 1 and Table 4). It is evident that retail enterprises and other similar organizations have undergone more considerable changes which resulted from transformation and organisational changes, and particularly statistical changes in the capturing of data. Statistical changes seem to be less considerable for the number of retail sales outlets (Table 4), with their number increasing during the 1990s. In 2000, they counted for around 12.5 thousand, which was the greater number of retail sales outlets. Since then their number has declined, as some retail shops have been taken over by larger supermarkets in the suburbs of the towns, while some small shops in towns and villages have been closed due to economic reasons.

In the structure of retail sales outlets, enterprises and other retail trade organizations experienced an increase in their absolute number and in their relative importance until 2000, but with an observed decline since then. Stores of agricultural enterprises and similar organizations have experienced their absolute and their relative declines with more stable developments since 2000. The retail sales outlets experienced greater volatility in their number and their relative importance, with declines in the mid-1990s and their subsequent recovery.

Table 4: Retail sales outlets¹

| | 1990 | % | 1995 | % | 2000 | % | 2003 | % |
|--|-------|-------|-------|-------|--------|-------|--------|-------|
| TOTAL | 6,638 | 100.0 | 6,972 | 100.0 | 12,457 | 100.0 | 10,751 | 100.0 |
| Enterprises and other organisations in retail trade | 3,647 | 54.9 | 4,428 | 63.5 | 8,559 | 68.7 | 6,698 | 62.3 |
| Stores of agricultural enterprises and other organisations ²⁾ | 808 | 12.2 | 685 | 9.8 | 269 | 2.2 | 268 | 2.5 |
| Other | 2,183 | 32.9 | 1,859 | 26.7 | 3,629 | 29.1 | 3,785 | 35.2 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

Notes: ¹⁾ 1990 and 1995 data include only enterprises with at least two persons in paid employment. 2000 and 2003 were collected with a sample and grossed with weighting methodology to the total observed activity.

²⁾ Retail outlets for forestry, hunting and fishing enterprises and organisations are included.

Since 2000, the number of retail stores has declined, which is consistent with the substitution of small retail shops by more efficient supermarkets. The number of stores in retail trade with food, beverages and tobacco increased until 2002, but declined in 2003. The specialized food and beverages stores oscillate over time, but tend towards declining. The declining tendency also holds for specialized stores with tobacco products. Non-specialized stores, predominantly with food, increased until 2002, but declined in 2003. The reduction in the number of retail trade shops with food, beverages and tobacco in 2003 clearly suggests some changes in concentration and shifts from smaller retail trade shops towards larger supermarkets, which is caused by a greater entry of foreign retail supermarkets such as Spar/Interspar, the ongoing process of mergers and concentration of retail trade by the largest Slovenian retail chain Mercator, and the entry of the new Slovenian supermarket chain, Tuš. Of course, there are also some other retail chains (e.g. Hardi) and retail trade shops.

Table 5: Stores in retail activity

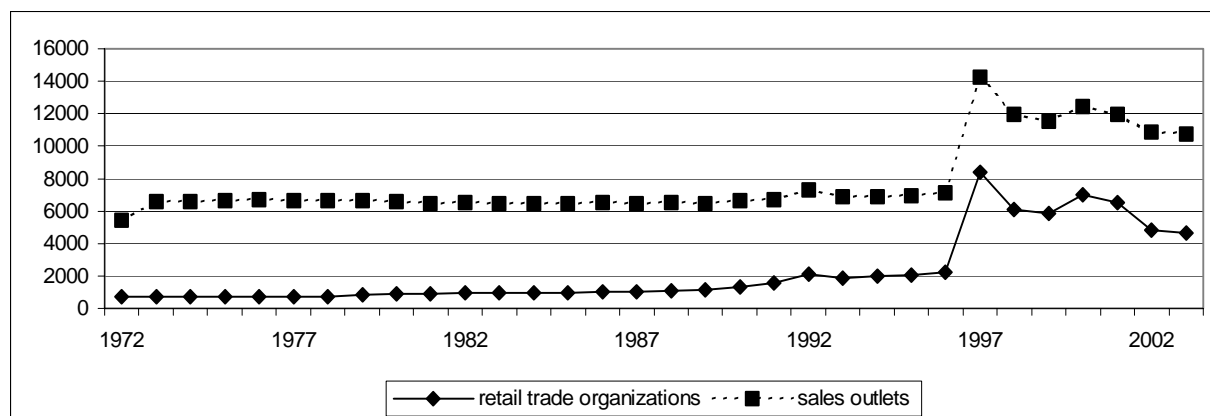
| | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|--------|--------|--------|--------|--------|
| TOTAL | 11,553 | 12,457 | 11,970 | 10,885 | 10,751 |
| Retail trade with food, beverages, tobacco | 4,538 | 4,512 | 4,587 | 4,604 | 4,356 |
| Food beverages (specialized stores) | 1,047 | 916 | 988 | 930 | 915 |
| Tobacco (specialized stores) | 357 | 330 | 298 | 286 | 280 |
| Non-specialized stores, predominantly with food | 3,134 | 3,267 | 3,301 | 3,389 | 3,161 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, 2004.

During the previous system, the number of inhabitants per sales outlet in retail trade in Slovenia was increasing (Figure 2). In spite of the statistical break in data, with the entry of small retail shops during the 1990s, the number of inhabitants per sales outlets in retail trade declined. With the process of mergers among the

Slovenian retailers and the entry of other domestic and foreign supermarkets, the number of inhabitants per sales outlet in retail trade has slightly increased since 1997, but it remains at a much lower level than during the previous system.

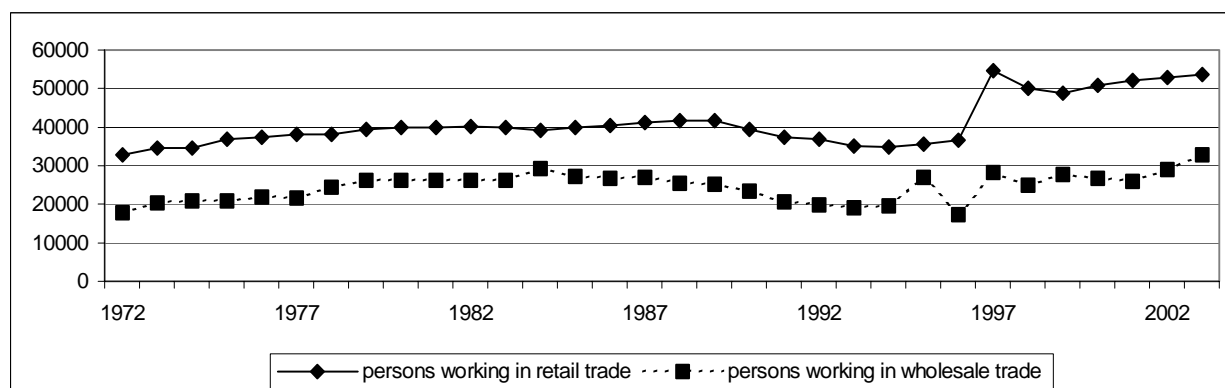
Figure 2: Number of inhabitants per sales outlet in retail trade in Slovenia, 1972-2003



Source: Data is taken from SORS, 2004.

The number of employees in retail and wholesale trade in Slovenia has increased (Figure 3). Since the mid-1990s, the increase has been more remarkable, suggesting that both retail and wholesale trade have been important sectors for generating new jobs. In the past the major portion of employees in trade were in traditional, socially-owned trade enterprises. Although to a certain extent, small ice cream and small-scale family run shops already existed during the previous system, small and medium-sized private enterprises in trade have been promoted since the end of the 1980s, which has also created new jobs. However, since the mid-1990s, mergers and takeovers have been important for the new process of trade concentration, which focuses on the creation of more efficient and cost-, margin- and price-competitive supermarkets.

Figure 3: Persons working in retail and wholesale trade in Slovenia, 1972-2003



Source: Data is taken from SORS, 2004.

Table 6 clearly reveals that the number of persons working in trade enterprises and other trade organizations during transition to a market economy has increased.

The most remarkable increase is recorded in enterprises and other organisations in retail trade, and to a lesser extent, in enterprises and other organisations in wholesale trade. On the other hand, there is a recorded decline for persons working in the stores of agricultural enterprises and similar organisations, and in other trade enterprises and organisations.

Table 6: Persons working in trade enterprises and other organizations

| | 1990 | % | 1995 | % | 2000 | % | 2003 | % |
|--|--------|-------|--------|-------|--------|-------|--------|-------|
| TOTAL | 39,331 | 100.0 | 35,472 | 100.0 | 50,897 | 100.0 | 53,658 | 100.0 |
| Enterprises and other organisations in retail trade | 25,113 | 63.9 | 24,160 | 68.1 | 35,493 | 69.7 | 37,045 | 69.0 |
| Enterprises and other organisations in wholesale trade | 4,998 | 12.7 | 4,974 | 14.0 | 7,206 | 14.2 | 9,202 | 17.1 |
| Stores of agricultural enterprises and other organisations | 2,625 | 6.7 | 2,196 | 6.2 | 798 | 1.6 | 1,155 | 2.2 |
| Other | 6,595 | 16.8 | 4,142 | 11.7 | 7,400 | 14.5 | 6,256 | 11.7 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

Note: Until 1995, only persons in paid employment in retail trade.

Within retail trade with food, beverages and tobacco, the greatest number of employees work in non-specialized stores predominantly with food (Table 7). Their absolute number and their relative importance are further increasing, while there are declining tendencies for persons working in specialized stores for food and beverages and for specialized stores for tobacco products. The increase in the former largely includes supermarkets, whose role is increasing, while the decline in the latter includes small specialized shops, whose role is declining. In 1999, 43.8 percent of persons working in trade enterprises and other trade organisations were working in retail trade with food, beverages and tobacco products, while in 2003 their share was 49.4 percent.

Table 7: Persons working in trade with food, beverages and tobacco

| | 1999 | % | 2001 | % | 2003 | % |
|---|--------|-------|--------|-------|--------|-------|
| TOTAL TRADE ORGANIZATIONS | 48,729 | | 52,011 | | 53,658 | |
| Retail trade with food, beverages, tobacco | 21,337 | 100.0 | 22,086 | 100.0 | 26,523 | 100.0 |
| Food beverages (specialized stores) | 3,157 | 14.8 | 2,890 | 13.1 | 2,549 | 9.6 |
| Tobacco (specialized stores) | 443 | 2.1 | 305 | 1.4 | 245 | 0.9 |
| Non-specialized stores, predominantly with food | 17,737 | 83.1 | 18,891 | 85.5 | 23,729 | 89.5 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, 2004.

However, retail trade with food, beverages and tobacco products experienced less significant turnover than in employment, suggesting that their productivity is less than in other trade enterprises and trade organizations. In 1999, 30.9 percent of the

turnover in trade was realized by retail trade with food, beverages and tobacco, while this figure was 37.4 percent in 2003 (Table 8).² Non-specialized stores, predominantly with food, conducted more than 81 percent in 1999 and in 2003 almost 91 percent of turnover in retail trade with food, beverages and tobacco products. The decline, even in nominal and in relative turnover, is recorded for specialized stores with food and beverages and to a lesser extent for specialized stores for tobacco products.

**Table 8: Turnover by trade activity of enterprises/organisations
(in million current SIT)**

| | 1999 | % | 2001 | % | 2003 | % |
|---|-----------|-------|-----------|-------|-----------|-------|
| TOTAL TRADE | 1,555,043 | | 1,684,770 | | 1,881,185 | |
| Retail trade with food, beverages, tobacco | 480,147 | 100.0 | 577,512 | 100.0 | 703,814 | 100.0 |
| Food and beverages (specialized stores) | 77,071 | 16.1 | 67,386 | 11.7 | 51,891 | 7.4 |
| Tobacco (specialized stores) | 13,609 | 2.8 | 12,267 | 2.1 | 13,691 | 1.9 |
| Non-specialized stores, predominantly with food | 389,467 | 81.1 | 497,859 | 86.2 | 638,232 | 90.7 |

Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, 2004.

4 FARM-GATE TO RETAIL PRICES AND MARKETING MARGINS

The farm-gate price is the average purchase price of directly-marketed agricultural produce through different marketing channels without subsidies. The farm-gate prices of cattle and pigs are recorded in live-weight. The average retail price is price achieved for a certain product in retail trade. To exclude the impact of inflation and to get a real price, prices at the farm-gate and at retail levels are deflated by the consumer price index with 1994 as the base year. The converging, diverging or more stable developmental patterns in real-farm gate prices vis-à-vis real retail prices will indicate whether marketing margin is declining, increasing or staying at approximately a similar level.

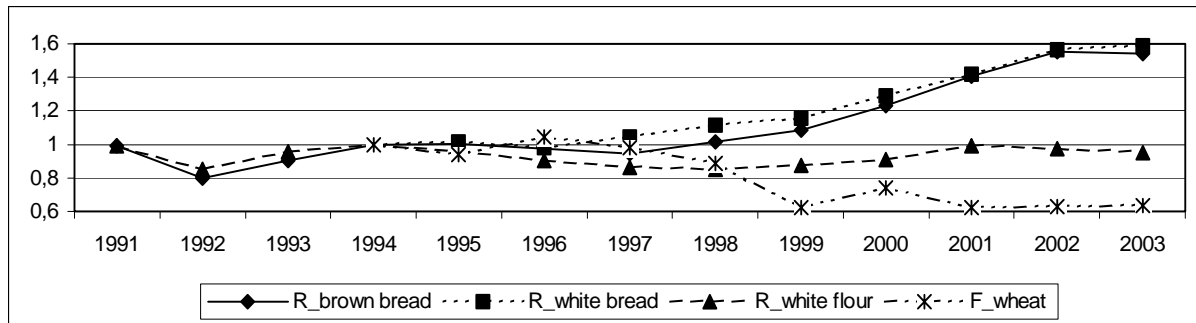
4.1 Wheat-flour-bread chain

Divergent patterns in marketing margin are observed in the wheat-flour-bread chain. As it is clearly illustrated in Figure 4, the real farm-gate wheat price (without direct subsidy payments for wheat producers) since the mid-1990s has declined, while the real retail white flour prices have remained rather stable, and

² In 2003, the value-added tax for total trade was 13.9 percent and for retail trade with food, beverages and tobacco products, 11.3 percent (9.7 percent for food and beverages in specialized stores, 13.9 percent for tobacco products in specialized stores, and 11.4 percent for products in non-specialized stores, predominantly with food).

the real retail white bread prices and brown bread prices have increased substantially. In 2003 there seems to have been greater stability in developments in real prices in the wheat-flour-bread chain, suggesting that competitive pressures are squeezing further increases, particularly in the real retail bread prices.

Figure 4: Real farm-gate wheat prices and real retail white flour and bread prices in Slovenia, 1991-2003 (1994=1)



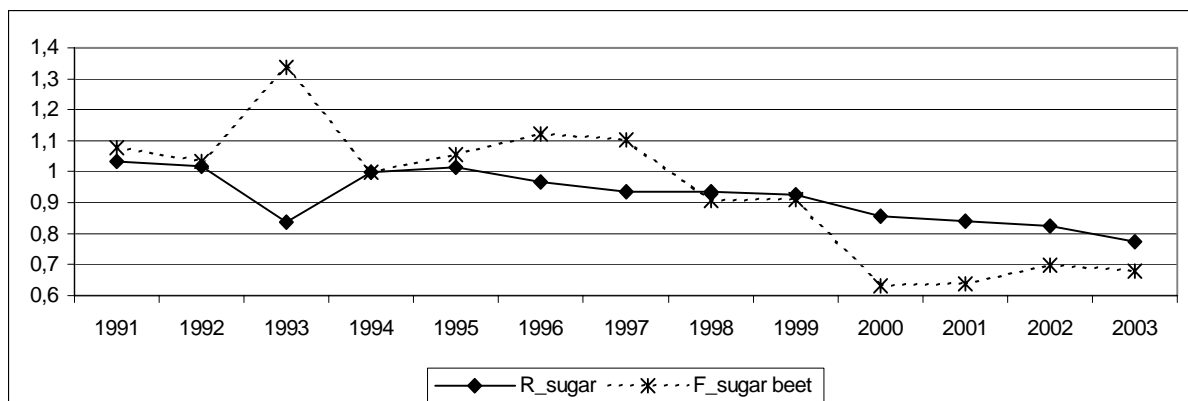
Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

Note: R – retail and F – farm-gate.

4.2 Sugar beet-sugar chain

The declining tendency in real farm-gate sugar beet and real retail sugar prices are observed in the sugar beet-sugar chain (Figure 5). Real farm-gate sugar beet prices without subsidy payments to producers have declined even more substantially, suggesting a certain increase in marketing margin in the sugar market before Slovenian membership in the EU.³ Since 2000, there can be observed a certain recovery in real farm-gate sugar beet prices, while real retail sugar prices further declined.

Figure 5: Real farm-gate sugar beet prices and real retail sugar prices in Slovenia, 1991-2003 (1994=1)



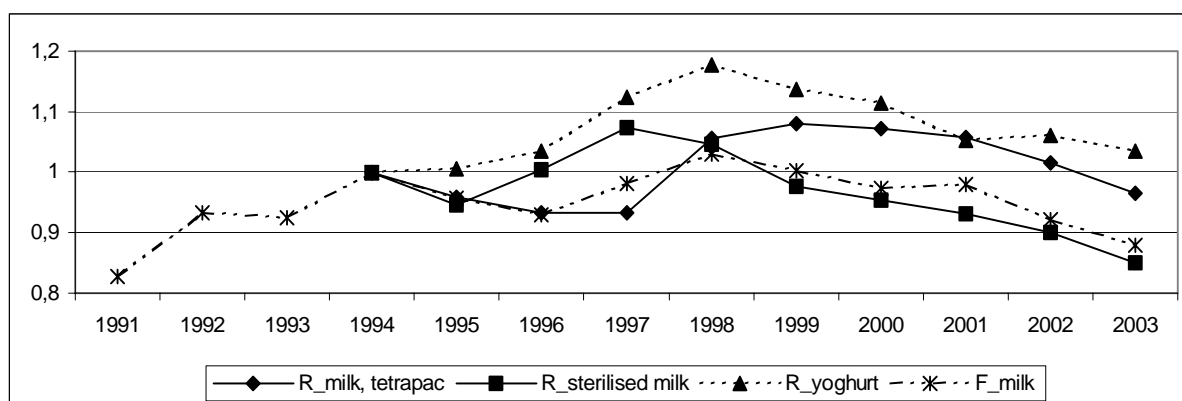
Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

³ The rapid increase in real farm-gate sugar beet prices in 1993 was associated with diverse weather conditions due to draught, and relatively low yields.

4.3 Milk-dairy chain

The real farm-gate milk price achieved its peak in 1998 (Figure 6). In the same year, real retail yoghurt price also achieved its peak. The real retail sterilised milk prices started to decline in 1997, as did the real tetra packed milk prices in 1999. These real milk price developments for Slovenia clearly indicate that within more closed Slovenian milk and dairy markets prior to 1998-1999, real milk and dairy prices were increasing. With trade liberalization and particularly with adjustments to the EU markets, under the pressures of the increased import competition the Slovenian real milk and dairy prices have started to decline, coming closer to the levels, in real terms, of the year 1991, when Slovenia became independent. Further real milk and dairy price declines are also observed after 2003, under the increased competition created by rival supermarket chains.

Figure 6: Real farm-gate milk prices and real retail milk and yoghurt prices in Slovenia, 1991-2003 (1994=1)



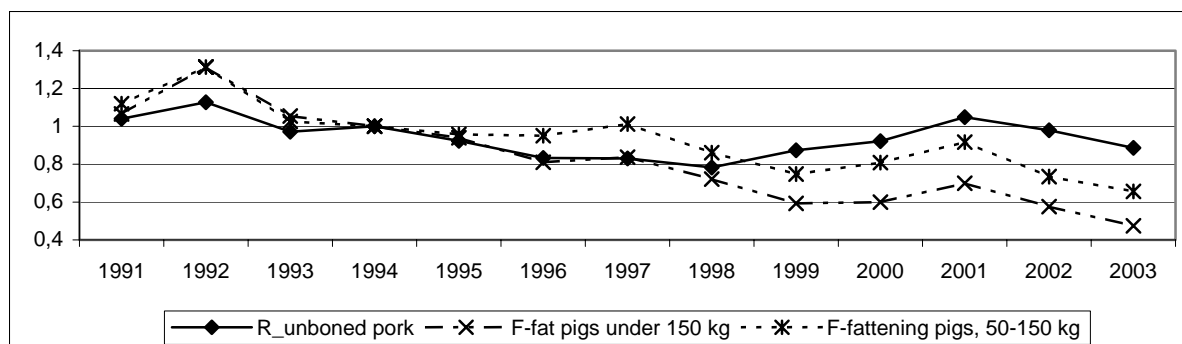
Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

Note: R – retail and F – farm-gate.

4.4 Pigs-pork chain

Real farm-gate pig prices have cyclically declined. The sharper declines are observed for real farm-gate prices for fat pigs over 150 kg than for the real farm-gate price for fattening pigs between 50 and 150 kg (Figure 7). This is consistent with consumer preferences and thus greater demands towards fattening pigs than fat pigs. The real retail price for boneless pork declined between 1992 and 1998. With a slight increase in real farm-gate pig prices, there is an even more considerable increase in real retail price for pork, which achieved its most recent peak in 2001. Since 2001, the real-farm gate pig prices, as well as the real retail prices for boneless pork have declined. It seems that the marketing margin has slightly increased, particularly since 1998. This is consistent with the finding by BOJNEC and PETER, 2002. The most recent increase in the marketing margin can be due to the greater significance of pork sold in the packed form. This requires some additional handling and marketing costs.

Figure 7: Real farm-gate pig prices and real retail pork prices in Slovenia, 1991-2003 (1994=1)



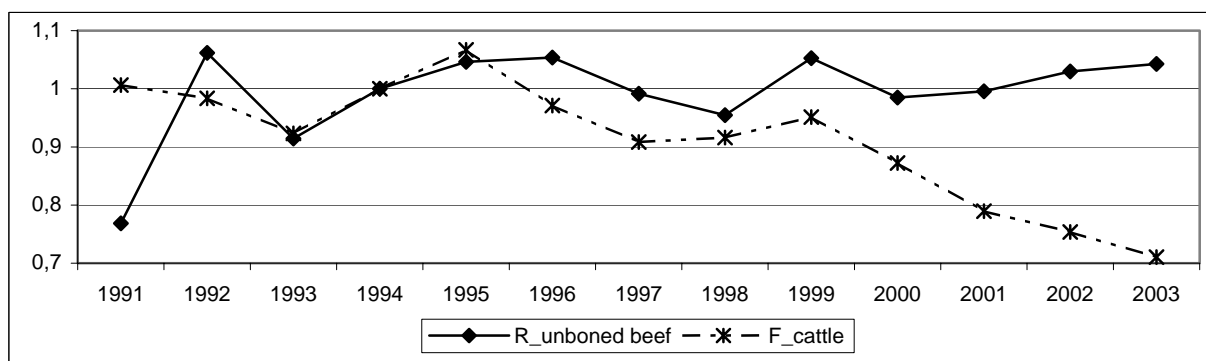
Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

Note: R – retail and F – farm-gate.

4.5 Cattle-beef chain

With Slovenian independence in 1991, there was a surplus in demand in the protected Slovenian cattle-beef chain, which resulted in the rapid increase in retail beef prices (BOJNEC, 1994; BOJNEC and PETER, 2002). With the introduction of beef price controls and trade liberalisation to encourage greater competition, the real retail beef price declined in 1993, but since then has cyclically increased (Figure 8). On the other hand, the real farm-gate cattle price has declined since 1995. As clearly illustrated in Figure 8, the gap in the patterns in development between the declining real farm-gate cattle price and the increasing real retail unboned beef price has occurred, clearly indicating the increase in the marketing margin in the cattle-beef marketing chain. This finding is consistent with the findings by BOJNEC and PETER, 2002) who argue that marketing margins in the cattle-beef marketing chain increased due to the reduction in farm-gate cattle price, while the retail beef price was more stable or even slightly increased.

Figure 8: Real farm-gate cattle prices and real retail beef prices in Slovenia, 1991-2003 (1994=1)

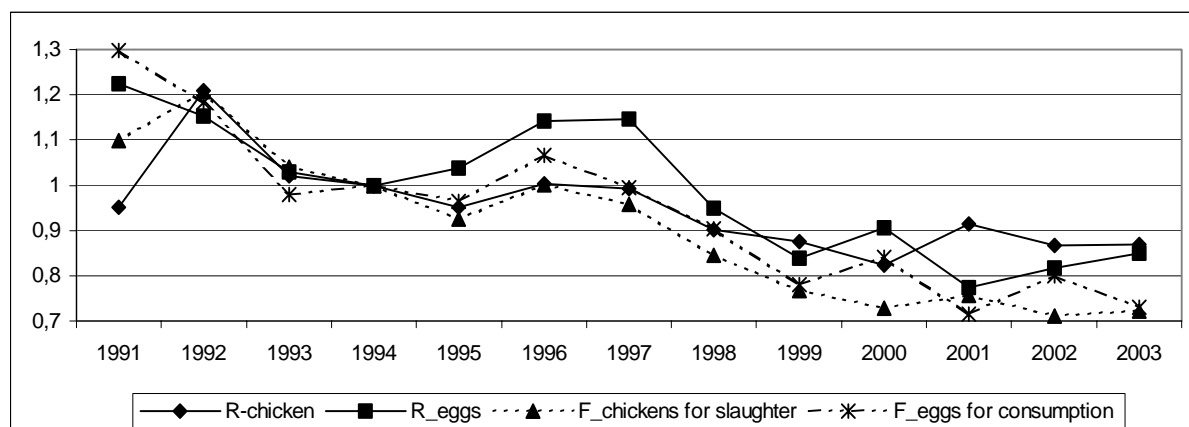


Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

4.6 Eggs-chicken chain

The eggs-chicken chain has experienced declines in real farm-gate and real retail prices for both eggs and chicken (Figure 9). The declines in farm-gate prices are even a bit more considerable than for retail prices, suggesting that marketing margins have not declined, but remained stable or even slightly increased. The declines in real prices in the eggs-chicken chain are likely to be a consequence of increased competition and efficiency improvements, particularly at the farm level.

Figure 9: Real farm-gate and real retail chicken and eggs prices in Slovenia, 1991-2003 (1994=1)

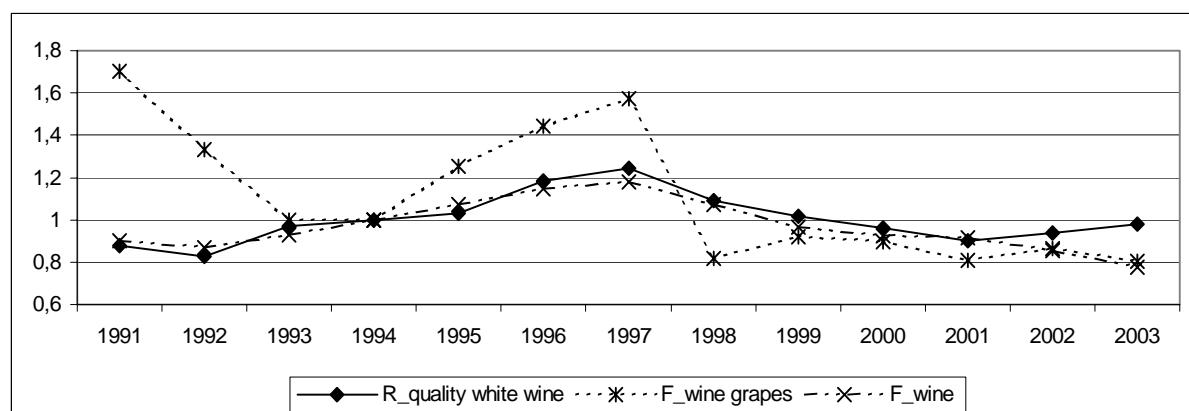


Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

Note: R – retail and F – farm-gate.

4.7 Wine grapes-wine chain

Figure 10: Real farm-gate wine grapes and wine prices and real retail white wine prices in Slovenia, 1991-2003 (1994=1)



Source: Author's calculations from data given from STATISTICAL YEARBOOK OF SLOVENIA, (various issues).

Relatively high price volatility is observed for the real farm-gate price for wine grapes, but with its rapid reduction in 1998, which was likely caused by an increase

in imports. After that, the patterns in development of these prices are more stable (Figure 10). Real farm-gate and real retail prices for wine increased prior to 1997. Since then, they have tended to decline, particularly at the farm-gate level. At the retail level, since 2001 there has been some recovery in white wine real retail prices.

5 CONCLUSIONS AND POLICY IMPLICATIONS

During the last fifteen years, the Slovenian agricultural and food marketing chains have experienced considerable changes which have been associated with many factors. First was the transition process, including agricultural and food sector transformation, privatisation and restructuring. This process has led to the diminishing role of traditional production and marketing structures. Second was Slovenian independence, which caused some disruption in the previous traditional upstream and downstream marketing links and induced some shifts in agricultural and food prices. Third was the liberalization of trade, the deregulation of markets and agricultural and food marketing chain adjustments to comply with EU membership. These processes brought with them related changes in retailing and agricultural and food marketing.

Within the structure of retail trade for food, beverages and tobacco products, the non-specialized stores, predominantly with food or supermarkets, are of the greatest importance and their significance has further increased, while the specialized food and specialized tobacco shops have shrunk. In the initial stage of transition, the entry of small shops was significant, but later developments in the Slovenian retailing sector have been associated with takeovers and mergers within the largest Slovenian retailers, such as Mercator, which is currently also represented abroad in the former Yugoslav markets. Agricultural and food products are also traded within another Slovenian chain of supermarkets, Tuš. The entry of foreign supermarkets, particularly Spar/Interspar, Hardi and some others have created competitive pressures on retail prices and marketing margin reductions, which have been clearly illustrated in the milk and dairy (the most important Slovenian agriculture and food chain) price reductions since 1998.

After Slovenian independence in 1991, several agricultural and food prices in real terms increased as a consequence of more protectionist domestic policy measures and limited competition in the relatively closed Slovenian markets. With trade liberalization and adjustments towards EU membership allowing the entry of new domestic and, particularly, foreign competition in retail trade, especially supermarkets, some real retail food prices have declined. The main exceptions were bread prices (until 2003), beef, and pork prices (until 2001). The tendency towards real price declines seems to be consistent with the price adjustments towards the levels in neighbouring countries, whereas in the past, several foreign shopping centres specifically focused on customers coming from Slovenia and

other countries in the region to do their shopping. The entry of different supermarkets in the Slovenian retailing market has led to quality and price adjustments, including some real price declines. This adjustment process has reduced transaction and actual consumer costs for buying several basic food products. Irrespective of these emerging and increasing competitive pressures, the rationalisation in marketing and the retailing of agricultural and food products, the wholesale and retail trade sector has continued to be an important source of job creation.

Real-farm gate and real retail price development have been analysed more in-depth, and indicate the size of marketing margins in Slovenia for main food products. The impact of competitive pressures on developments in different food chains varies. As has been clearly illustrated, there are some similarities, but also differences in real price and marketing margins developments in vertical food chains. The diverging patterns in real price developments at farm-gate and at retail levels are confirmed for the wheat-flour-bread chain, suggesting an increase in the marketing margin. Real farm-gate wheat prices have declined due to trade liberalization and a policy shift from market-price support towards direct payments. The increased real consumer prices for bread may indicate that in the past bread prices were regulated at relatively low levels and have thus increased with price deregulation. This increase may also capture structural changes in quality improvements. Yet, it may also indicate the presence of monopolistic competition in local and regional markets and thus might be a consequence of a lack of competition in these markets. Their price stabilisation in 2003 may reflect an increase in competitive pressures to a level of fulfilment of market niches. The diverging patterns with real farm-gate prices decline and real retail price stability increases, thus the increase in the farm-gate to retail-price spread are also confirmed for the cattle-beef chain, and to a lesser extent for the sugar beet-sugar and pigs-pork chains. Finally, the real farm-gate and real retail prices tend to decline as well for the sugar beet-sugar and eggs-chicken chain, and to a lesser extent for the wine grapes-wine marketing chain.

Since Slovenia became an EU member on 1 May 2004, there have been further price adjustments. Among the most important are the continuation in the introduction of retailer's brand names in supermarkets for processed food and beverages. There has been also a further drop, now stabilized, in consumer milk and dairy prices. For drink producers and consumers, there has been an increase in sugar prices. Quality and price adjustments with the Single European Market, particularly with neighbouring countries, have been an ongoing process under more severe competitive market pressures by supermarkets and their contractual suppliers.

REFERENCES

- BOJNEC, Š. (1994): Agricultural reform in Slovenia, in: SWINNEN, J. F. M. (ed.): Policy and Institution Reform in Central European Agriculture, Avebury, Aldershot, pp. 135-168.
- BOJNEC, Š., MÜNCH, W. (2000): Slovenia's accession to the European Union: Implications for the agricultural sector, in: HARTELL, J. G., SWINNEN, J. F. M. (eds.): Agriculture and East-West European Integration, Ashgate, Aldershot, pp. 107-134.
- BOJNEC, Š., PETER, G. (2002): Price transmission and marketing margins in the Slovenian beef and pork markets during transition, paper presented at the 10th EAAE Congress "Exploring Diversity in the European Agri-food System", Zaragoza/Spain, 28.-31.08.2002.
- CABRAL, L. M. B. (2000): Introduction to industrial organization, MA, The MIT Press, Cambridge.
- CHRYSTAL, K. A., LIPSEY, R. G. (1997): Economics for business and management, Oxford University Press, Oxford.
- DRIES, L., REARDON, T., SWINNEN, J. F. M. (2004): The rapid rise of supermarkets in Central and Eastern Europe: Implications for the agrifood sector and rural development, *Development Policy Review*, Vol. 22, No. 4.
- EUROPEAN COMMISSION (2004): The future of rural areas in an enlarged EU: Perspectives for the New Member States in Central and Eastern Europe and Bulgaria and Romania, Office for Publications of the European Communities, Luxembourg.
- HARTMANN, M., WANDEL, J. (eds.) (1999): Food processing and distribution in transition countries: Problems and perspectives, *Studies on the Agricultural and Food Sector in Central and Eastern Europe*, Vol. 3, Wissenschaftsverlag Vauk Kiel KG, Kiel.
- KORNAI, J. (1992): The socialist system: The political economy of Communism, Oxford University Press, Oxford.
- MCALEESE, D. (2004): Economics for business: Competition, macro-stability and globalisation, Prentice Hall, Harlow.
- REARDON, T., SWINNEN, J. F. M. (2004): Agrifood sector liberalization and the rise of supermarkets in former-state controlled economies: Comparison with other developing countries, *Development Policy Review*, Vol. 22, No. 4.

SCARCITY AND PREFERENCES (DATA ENVELOPMENT ANALYSIS OF MOSCOW REGION CORPORATE FARMS)

*NIKOLAY SVETLOV**

ABSTRACT

The aim of this paper is to offer a theoretical framework for revealing farms' preferences based on a data envelopment model and to test a hypothesis regarding short-term profit maximising behaviour of Moscow region corporate farms. Data from 2002 and 2003 are used. The initial hypothesis is rejected in favour of Baumol's oligopolistic (revenue-maximising) behaviour. Non-monetary utility components do not pertain to the revealed corporate farms preferences. With respect to the revealed preferences, the scarcest resources in 2002 and 2003 are machinery (56.3 and 50.6 % of farms, respectively), cows (47.7 and 37.6 %), haylands and pastures (39.2 and 50.6 %). The political implication of this study is a need for institutional improvements which aim to lower transaction costs, improve access to market information, and increase competition within the market environment.

***Keywords:** Utility function, revealed preferences, Data Envelopment Analysis, corporate farms, Moscow region, oligopoly.*

1 INTRODUCTION

For the purpose of developing a regional agrarian policy, it is necessary to know the preferences which determine farm level decision-making. This knowledge:

- Facilitates the correct prediction of farms' reactions to a given change in either a political or market environment;

* Moscow Timiryazev Agricultural Academy (MTAA), Russian Federation,
E-mail: svetlov@timacad.ru.

- Justifies microeconomic models, since being based on an incorrect assumption about farm utility, the modelling commonly ends in biased estimations or even fails.

Methodological issues of approaching farm's utility are discussed in AMADOR et al., (1998), LIEN and HARDAKER (2001). These papers suggest a set of survey and data processing tools that aim to identify decision-making determinants. However, it is possible that the reported and revealed preferences may differ.

Discussion of Russian farm preferences mostly concentrates on the validity of the profit-maximising behaviour assumption. SEROVA (1999) argues that this assumption cannot be applied to Russian farms for historical and institutional reasons. In BEZLEPKINA (2004) the opposite position is taken and shown to be in accordance with the available data on Moscow region corporate farms. SVETLOV (2002b), by means of a farm sample approach, shows that, in addition to short-term profit (which is imposed), farm utility is sensitive to depreciation, wages and herd population.

These differences can be caused by both temporary and methodological reasons. Therefore, at least two research tasks can be identified: Improving methodology by making it simple, reliable and transparent; regularly monitoring preferences in order to register and explain observable changes.

The aims of this study are:

- To offer a theoretical framework for revealing farms' preferences;
- To test the hypothesis regarding short-term profit maximising behaviour displayed by Moscow region corporate farms;
- To measure the scarcity of resources used by Moscow region corporate farms in order to identify institutional imperfections and to help develop reasonable agrarian policies.

2 THEORETICAL FRAMEWORK

A theoretical base for revealing preferences, developed in SVETLOV (2002a), rely on classical results in mathematical programming (KUHN and TUCKER, 1951; UZAWA, 1958) and on the general reciprocity theorem by LOURIER (1966). The latter, unlike duality theory, deals with the reciprocal exchange of an objective function and a bound constraint. Following this theorem, a reciprocal problem has the same optimum as an original one, and the Lagrangean vectors of both problems differ only in scale and order of the components. This result spans all mathematical programming problems, regardless of (non)convexity, providing that their feasible sets are closed.

Briefly, the theoretical framework is the following: Assume that $\mathbf{x}^* = (x_1^*, x_2^*, \dots, x_n^*)$ is an optimum of the problem

$$\max_{\mathbf{x}} (u(\mathbf{x}) \mid \mathbf{x} \in X), \quad (1)$$

where $\mathbf{x} = (x_1, x_2, \dots, x_n)$ is a vector of state variables, $u(\mathbf{x})$ is an objective function and X is a set of feasible solutions. If this problem is convex, then

$$\max_{\mathbf{x}} (\langle \boldsymbol{\varphi}, \mathbf{x} \rangle \mid \mathbf{x} \in X), \quad (2)$$

where $\langle \boldsymbol{\varphi}, \mathbf{x} \rangle$ is a tangent to $u(\mathbf{x})$ in \mathbf{x}^* , yields the same optimum \mathbf{x}^* . From UZAWA (1958) and LOURIER (1966) it follows that, having defined $\mathbf{h} = (x_2, \dots, x_n)$ and $\mathbf{h}^* = (x_2^*, \dots, x_n^*)$, the optimal solution of the problem

$$\max_{\mathbf{x}} (\varphi_1 x_1 \mid \mathbf{x} \in X, \mathbf{h} = \mathbf{h}^*), \quad (3)$$

is also \mathbf{x}^* , and Lagrangean multipliers for the equation $\mathbf{h} = \mathbf{h}^*$ are $\varphi_2 \dots \varphi_n$ providing that $\boldsymbol{\varphi} = (\varphi_1, \varphi_2, \dots, \varphi_n)$. It is assumed here that the optimum and the tangent are both unique; SVETLOV (2002a) spans the general case.

Presume now that (1) represents an economic agent that makes a choice from among the technologies belonging to a technological set X by maximising a utility represented by an unknown function $u(\mathbf{x})$, which moves this agent to an observable position \mathbf{x}^* . Then, as follows from the aforementioned transformations, it is possible to recover $\boldsymbol{\varphi}$ by solving the problem (3), thus revealing a tangent to $u(\mathbf{x})$ in \mathbf{x}^* . This tangent represents the local preferences of the economic agent (1) in a vicinity of \mathbf{x}^* .

3 EMPIRICAL MODEL

In this study, the empirical specification relies on data envelopment method of representing a technological set (CHARNES et al., 1978). The empirical model is formulated as

$$\max_{k, \boldsymbol{\lambda}} (h_{im,1} - kh_{im,2} \mid \mathbf{A}_m \boldsymbol{\lambda} \leq k \mathbf{a}_{im}, \mathbf{B}_m \boldsymbol{\lambda} \geq \mathbf{b}_{im}, \mathbf{H}_m \boldsymbol{\lambda} = \mathbf{h}_{im}, \langle \mathbf{i}, \boldsymbol{\lambda} \rangle = 1), \quad (4)$$

where \mathbf{a}_{im} and \mathbf{b}_{im} are actual inputs and outputs on a farm i accessing m -th technological set; $\mathbf{h}_{im} = (h_{im,1}, h_{im,2}, \dots, h_{im,6})$ is a vector of utility components on the same farm; \mathbf{i} is a vector of ones; matrices $\mathbf{A}_m = (\mathbf{a}_{im})$, $\mathbf{B}_m = (\mathbf{b}_{im})$, $\mathbf{H}_m = (\mathbf{h}_{im})$; $\boldsymbol{\lambda}$ is a vector of intensities of available technologies; k is a scalar.

The utility components, which compose \mathbf{h}_{im} , are revenue ($h_{im,1}$, thousand roubles), short-term costs ($h_{im,2}$, thousand roubles), wages ($h_{im,3}$, thousand roubles), short-term

loans ($h_{im,4}$, thousand roubles), long-term loans ($h_{im,5}$, thousand roubles), and cow population ($h_{im,6}$, thousand roubles).

Some of the named utility components need special comments. Loans appear here, on one hand, as a possible source of liquidity, which is valuable under the Russian conditions characterised by the hindered access of farms to sources of financing; on the other hand, some managers are seen as displaying loan-averse behaviour because they are uncertain about their ability to repay them due to high risks, both market and political, and inaccessible (too expensive) insurance.

The available literature suggests that managers may overestimate herd utility (see e.g. BEZLEPKINA, 2004), which justifies the presence of cow population among utility components.

Depreciation is excluded from costs, as this specification deals with the short-term profit maximisation hypothesis.

There are 9 inputs: Arable land (ha); pastures and haylands (ha); agricultural labour (number of agricultural workers); sources of financing production costs (thousand roubles per year); number of sows; number of cows; number of sheep; fixed production assets (thousand roubles); machinery (approximated by spare part expenses, in thousand roubles).

Arable land is represented by an actually available area on the right hand side of the $\mathbf{A}_m \boldsymbol{\lambda} \leq \mathbf{a}_{im}$ constraint, but for a sown area on its left hand side. The reason is that many farms waste arable land due to a lack of machinery, lack of short-term financing or difficult competition against imports. Thus, arable land area cannot be used as an indicator of technologically-justified consumption of arable land, which must appear on the left hand side of this equation. As beef cattle are not bred in the Moscow region, there is no need to split cows in the model into dairy and meat breeds. Beef is produced only through the rejection of calves or dairy cows.

The outputs are grains (kg×100); potatoes (kg×100); vegetables (kg×100); other crops (thousand roubles); beef (kg×100); pork (kg×100); mutton (kg×100); other meat (kg×100); milk (kg×100); wool (kg×100); other animal production (thousand roubles); and non-agricultural production (thousand roubles). Poultry farms are not included in this study.

The objective function of (4) is equivalent to minimising k from the point of view of the resulting optimal solution. However, the form of short-term profit maximisation, which is actually used in (4), allows a monetary measure of shadow prices, which is convenient for the analysis.

The hypothesis is that the farms display short-term profit-maximizing behaviour. This is tested in the following way:

- The vectors γ_{im} of shadow prices for the constraint $\mathbf{H}_m \boldsymbol{\lambda} = \mathbf{h}_{im}$, which correspond to $\boldsymbol{\phi}$ in problem (2), are obtained from (4) for each farm i regardless of the corresponding m ;
- The components of these vectors are statistically tested for differences from zero by means of t -test. According to the hypothesis, those which relate to revenue and short-term costs are expected to significantly differ from zero and to be close to 1 and -1, respectively. The rest of the components are not expected to differ from zero.

Scarcity of a resource is signalled by a non-zero component in a vector of shadow prices relating to the $\mathbf{A}_m \boldsymbol{\lambda} \leq \mathbf{a}_{im}$ constraint. Widespread non-zero components throughout a set of farms indicates the prevalence of scarcity.

Shadow prices that characterise the constraint $\mathbf{B}_m \boldsymbol{\lambda} \geq \mathbf{b}_{im}$ are analysed by means of comparison against market prices. A large difference suggests one of the following:

- Large transaction costs;
- Misreported prices;
- A large difference between financial and economic prices (presence of a hidden utility attached to the output).

4 DATA

Moscow region corporate farm data from 2003 (364 farms) is used. For comparison and robustness tests, the model was also run using similar data from 2002 (381 farms). The source of data is the State Statistical Committee of the Russian Federation, which holds a database of approximately 250 variables regarding Russian corporate farms that have submitted their annual reports to the regional statistical institutions. The subset used in this study includes variables from all the utility components, inputs and outputs mentioned in Section 3 and, additionally, average prices of all outputs except those measured with revenue from sales. The prices are calculated as a revenue from sales of a particular output (thousand roubles) per amount of sales (kg \times 100).

The data envelopment approach commonly presumes that all technologies that are actually applied by farms appearing in the data set are available to any other farm. This is often true in the long run, providing that the farms have sufficient investment opportunities for adjusting their technological capacity. This is hardly the case of the studied farms, since their assets were formed under a very different

institutional system and price structure. A lot of time and money is required for complete technical restructuring, which often requires developing branches of agricultural production that are completely new for a particular farm.

Following the experience of an earlier study (SVETLOV, 2004), a simple and practical means of avoiding this problem are used. They are based on the assumption that if a farm does not sell a given output, then the technologies that produce this output are unavailable to this farm in the short run.

In order to implement this approach, the initial data sets from 2003 and 2002 are classified into subsets so that all farms in a subset produce exactly the same set of outputs. The criterion of forming such sets is later called a *production pattern*. Different production patterns correspond to different values of subscript m in (4). As soon as the production patterns are defined, the specific matrices \mathbf{A}_m , \mathbf{B}_m and \mathbf{H}_m are formed for each subset. This facilitates defining a production frontier that is specific for a particular production pattern. Among all the production patterns available from the data set of 2003, only six were used in this study, since others were represented by too few farms. In 2002, seven patterns were found to meet the requirements of this study. As a result, this study uses only 178 data items of the 364 available in 2003, and 199 of 381 data items available in 2002.

The definition of patterns is presented in Table 1.

BEZLEPKINA (2004) admits that Russian farms might misreport an amount of inputs and outputs (and, consequently, financial results). Commonly, the purpose of false reports is to hide thefts and illegal transactions. Since many farms neither really consider the option to be lenders, nor intend to raise the value of their shares, they have no reason to display good financial results and high production efficiency. That is why, commonly, they over-report inputs and under-report outputs. Consequently, using non-frontier data processing methodologies like OLS, a researcher can come up with confusing results.

In the case of data envelopment representation of a technological set, the farms that misreport their status in the described manner just move to the downside of the frontier and are unlikely to affect results considerably. At worst, this effect partially hides an existing technological capacity. Under these conditions, it is not possible to identify the distortions caused by this problem. Unless there are explicit reasons for attaching a certain outcome of the model to the problem of misreporting, one should interpret the outcome as "the best of available knowledge", since the data envelopment approach is less sensitive to this problem than non-frontier modelling.

Table 1: Production patterns involved in the analysis

| Outputs | Production patterns | | | | | | |
|-----------------------------|---------------------|----|-----|----|----|----|-----|
| | I | II | III | IV | V | VI | VII |
| 2003 | | | | | | | |
| Grains | + | + | – | + | – | – | × |
| Potatoes | – | + | – | + | – | – | × |
| Vegetables | – | – | – | + | – | – | × |
| Other crops | + | + | + | + | – | + | × |
| Beef | + | + | + | + | – | + | × |
| Pork | – | – | – | – | – | + | × |
| Milk | + | + | + | + | – | + | × |
| Other animal production | + | + | + | + | + | + | × |
| Non-agricultural production | + | + | + | + | + | + | × |
| Number of farms | 62 | 44 | 28 | 23 | 11 | 10 | × |
| 2002 | | | | | | | |
| Grains | + | + | + | – | + | + | – |
| Potatoes | – | + | + | – | + | – | + |
| Vegetables | – | – | + | – | + | – | + |
| Other crops | + | + | + | + | + | + | + |
| Beef | + | + | + | + | + | + | + |
| Pork | – | – | – | – | + | + | – |
| Milk | + | + | + | + | + | + | + |
| Other animal production | + | + | + | + | + | + | + |
| Non-agricultural production | + | + | + | + | + | + | + |
| Number of farms | 59 | 54 | 29 | 21 | 12 | 12 | 12 |

Source: Author's calculations based on data of Moscow Region farm registry (2002, 2003; unpublished).

Notes: '+' means presence of the output in the production pattern, '–' means absence, '×' denotes a meaningless cell. The outputs that are absent in all modeled production patterns are omitted.

5 RESULTS

Table 2 presents the statistical characteristics of the components of γ_{im} obtained from (4) having been solved 377 times. This Table characterises the tangent to the revealed preferences of the studied farms in their actual states.

Table 2: Statistical characteristics of tangents to revealed preferences functions in the actually observed state of a farm

| | Revenue | Costs | Wages | Short-term loans | Long-term loans | Herd population |
|--------------------------|--------------|--------|--------|------------------|-----------------|-----------------|
| 2003: Average | 1.049 | -0.041 | -0.264 | -0.254 | 0.007 | -12.139 |
| 2003: Standard deviation | 0.540 | 0.604 | 2.058 | 0.944 | 2.037 | 40.361 |
| 2003: <i>p</i> -value | 0.948 | 0.054 | 0.102 | 0.212 | 0.003 | -0.236 |
| 2002: Average | 0.765 | -0.095 | -0.106 | -0.290 | 0.486 | 6.448 |
| 2002: Standard deviation | 0.439 | 0.345 | 1.341 | 6.757 | 3.093 | 16.239 |
| 2002: <i>p</i> -value | 0.919 | 0.217 | 0.063 | 0.034 | 0.125 | 0.309 |

Source: Author's calculations based on data from the Moscow Region farm registry (2002, 2003; unpublished).

Note: Bold values indicate a significant difference from zero at a 90 % confidence level.

The components of γ_{im} are empirically distributed nearly symmetrically. The excess of the empirical distributions is considerably higher than that of a normal distribution. Because of this, the *t*-test is applied here with the reservation that the rejection of the hypothesis regarding the zero value of a component is even more reliable than follows from the confidence level. However, if the hypothesis is not rejected, it is not wholly convincing that it would not also be rejected if one knew the true distribution.

As follows from Table 2, the data from 2003 reject the null hypothesis of this study, which is formulated in Section 3, at a 90 % level of confidence. No utility components except revenue are shown to reliably belong to the true utility function: The hypotheses regarding their insignificance are not rejected. Surprisingly, the revealed preferences miss costs: $\gamma_2 \approx 0$, where $\gamma = (\gamma_1 \dots \gamma_6)$ is a vector of averages throughout γ_{im} . As for the revenue, $\gamma_1 \approx 1$ (difference from unity is rejected at a 90 % confidence level). This perfectly conforms to BAUMOL'S (1967) theory, which suggests the revenue maximizing behaviour of agents acting under the conditions of oligopoly-type competition, concerned mostly with preserving and increasing their share of the available market.

The data from 2002 yield similar results, but the marginal utility of the revenue noticeably, although not significantly in a statistical sense, differs from 1 (mean value is 0.77). The possible cause is that in 2002, the farms (especially vegetable producers) made their decisions under very unstable prices, which made it scarcely possible to optimize production programmes.

With respect to the above-reported results, the question can arise whether the test throughout the set of γ_{im} -vectors obtained from subsets based on different production patterns is valid. The data from Table 3 suggest that the heterogeneity possibly caused by differences in production patterns cannot be attributed to the corporate farms utility function.

In Table 3, the values of γ_{im} are averaged over m , except for the least numerous subsets, which are joined together. In 2003, the conclusion regarding the revealed preferences in all subsets remains the same throughout all production patterns.

Table 3: Average tangents to revealed preferences functions in the actually observed state of a farm (by subsets)

| Subsets | Revenue | Costs | Wages | Short-term loans | Long-term loans | Herd population |
|-------------|------------------------------|-----------------|-----------------|-------------------------------|-----------------|------------------|
| 2003 | | | | | | |
| I/2003 | 1.04 (-0.97) | -0.07 (0.09) | -0.34 (0.14) | -0.41 (0.31) | 0.04 (-0.02) | -0.16 (0.01) |
| II/2003 | 1.02 (-0.95) | -0.13 (0.33) | 0.13 (-0.09) | 0.00 (0.05) | -0.46 (0.15) | -11.25 (0.35) |
| III/2003 | 1.36 (-0.96) | -0.08 (0.09) | -1.25 (0.43) | -0.04 (0.08) | 0.73 (-0.34) | -31.65 (0.33) |
| IV-VI/2003 | 0.88 (-0.94) | 0.14 (-0.13) | 0.19 (-0.05) | -0.44 (0.24) | -0.11 (0.06) | -23.44 (0.52) |
| 2002 | | | | | | |
| I/2002 | 0.60 (0.74) | -0.16 (0.30) | 0.41 (-0.27) | 0.66 (-0.09) | 0.04 (0.02) | 4.91 (0.26) |
| II/2002 | 0.88 (1.00) | -0.07 (0.20) | -0.31 (0.34) | -0.42 (0.39) | 0.69 (0.41) | 3.07 (0.19) |
| III/2002 | 0.82 (1.00) | -0.17 (0.66) | -0.28 (0.34) | 0.95 (-0.24) | 0.00 (0.00) | 9.63 (0.70) |
| IV/2002 | 0.86 (0.91) | 0.17 (-0.78) | -0.09 (0.09) | -9.23 (0.95) | 0.65 (0.32) | 10.01 (0.32) |
| V-VII/2002 | 0.83 (0.88) | 0.26 (-0.37) | -1.11 (0.25) | 1.87 (-0.12) | 1.18 (0.15) | 12.57 (0.43) |

Source: Author's calculations based on data from the Moscow Region farm registry (2002, 2003; unpublished).

Notes: Bold values relate to a significant difference from zero at a 90 % confidence level; values in brackets are p -values.

As for year the 2002, in subsets I/2002 and V-VII/2002 γ_{im} vary too widely to form any conclusion about preferences, but p -values associated with revenue utility are the largest. Subsets II/2002 and III/2002 yield the typical result, which is in line with Baumol's theory. Noticeably, farms of subset IV/2002, spanning strictly specialised dairy farms, display short-term credit-averse behaviour. As a farm is not the only actor making a decision whether or not to access short-term loans, this result rather indicates that banks tend to hamper the access of dairy farms to short-term loans. Yet, the reason for such differences in the revealed preferences is not clear: Unlike subsets I/2002-III/2002, farms of subset IV/2002 are profitable, on average, in 2002. It is likely that this outstanding result is just occasional, which is quite possible in the subset of only 21 farms.

Although not statistically significant, in 2002 a herd population is rather attractive to farms in all subsets, contrary to 2003 when the situation is opposite. It is possible that the difference is not occasional. The reason is that in 2002-2003, the production costs of dairy farming kept growing (by 9.9 %, according to the data sets used in this study), while milk and meat prices barely changed (growth of 2.1 %). This likely resulted in increasing fears about the commercial efficiency of milk production in the long run.

To conclude, in 2002 the set of farms is less homogenous with respect to γ_{im} than in 2003; however, the observed differences are not large enough to doubt the above formulated conclusion about revealed preferences.

Findings regarding resource scarcity in 2002 support most of the earlier results for the same year reported in SVETLOV (2004): The scarcest resources are found to be machinery (56.3 % of farms), cows (47.7 %) and land (haylands and pastures – 39.2 %, arable land – 26.6 %). The difference is that the model (4) shows low scarcity of the sources of production cost financing (10.6 %). This is explained by the constraint on short-term loans, which, unlike in SVETLOV (2004), explicitly appeared in the model (4): In 27.1 % of farms, at least one of these two constraints is bound. The presence of a long-term credit constraint also partially captures the effect of short-term financial shortages: Omitting this constraint, when it is bound, often leads to turning short-term financing into a scarce resource. In 2003, the situation barely changed: Scarcity of machinery is registered in 53.4 % of farms, of haylands and pastures – in 50.6 %, of cows – in 37.6 %, of arable land – in 36.5 %. The share of farms lacking sources of production cost financing increased to 24.2 % (either of themselves or of short-term credit – to 34.8 %). This is an expected change, as the year 2002 was characterized by lower profits than the previous two years.

Other fixed inputs rarely constrain farms' utility function.

Mean values of shadow prices for inputs are shown in Table 4. This table includes four inputs that are not considered as utility components, represented by data from both years and used in the majority of farms, thus providing representative statistics. Due to decreased profitability, an average shadow price of arable land decreases in 2003. So the positive changes in land shadow prices in 2002, in comparison to earlier periods, noted in SVETLOV (2004), appeared to be temporary. For haylands and pastures, however, the shadow prices remained nearly unchanged. Due to the continuing reduction of the number of employees and the growth of wages, the shadow price of agricultural workers more than doubled. Finally, the incentives to expand machinery usage quadrupled.

The above presented results remain robust throughout numerous tests by means of changing the empirical model specification: Varying control for return to scale, trying different combinations of utility components, including depreciation into costs, and omitting outstanding technologies.

In the majority of solutions, despite a particular model specification, k in (4) is equal to 1. Hence, the revealed preferences are attached to the *actual* state of the studied farms in 2002 and 2003. This note addresses the methodological problem originating at the possible difference of tangents to a true utility function in actual and optimal, with respect to (4), states of farms.

Table 4: Average values of shadow prices of inputs, thousand roubles per unit

| Year | Arable land, per ha | Haylands and pastures, per ha | Agricultural workers, per man | Spare parts, per thousand roubles |
|--------|---------------------|-------------------------------|-------------------------------|-----------------------------------|
| 2003 | 1.81 | 4.51 | 104.30 | 7.20 |
| 2002 | 4.19 | 4.17 | 50.85 | 1.92 |
| Growth | -2.39 | 0.34 | 53.45 | 5.28 |

Source: Author's calculations based on data from the Moscow Region farm registry (2002, 2003; unpublished).

Note: The values are mean values.

The difference between shadow prices and actual prices barely changes in 2003 compared to 2002 for all outputs (Table 5), giving no reason to presume large biases in shadow price estimations. The data on pork are not presented in this table, as, due to relatively heterogeneous subsets of pork-producing farms, the estimated value varies too widely in robustness tests.

Table 5 suggests that the potatoes, vegetables and milk markets are close to equilibrium: Average market prices are close to average shadow prices in both years.

As for grains and beef, we observe the evidence of either serious market distortions persisting through time or of misreported revenues or sales. In the case of grain, as data show, this problem deepens in 2003. In our case, both explanations are possible. In particular, it is to be expected that the reported sales might include grain used by farm employees for feeding own cattle. However, a special study is necessary to split possible causes of the observed difference between actual and shadow prices.

Table 5: Average values of actual and shadow prices of outputs, roubles per unit

| | Year | Grains, per kg | Pota- toes, per kg | Veget- ables, per kg | Other crops, per rou- ble | Beef, per kg | Milk, per kg | Other animal produc- tion, per rouble | Non- agricul- tural produc- tion, per rouble |
|---|------|-------------------|-----------------------------|----------------------------|---------------------------------------|--------------------|--------------------|--|---|
| Prices | 2003 | 2.76 | 5.97 | 4.68 | 1.00 | 18.15 | 5.84 | 1.00 | 1.00 |
| | 2002 | 2.19 | 4.89 | 4.33 | 1.00 | 19.50 | 5.60 | 1.00 | 1.00 |
| Shadow prices | 2003 | 8.65 | 5.37 | 4.17 | 11.70 | 37.72 | 5.19 | 2.77 | 1.93 |
| | 2002 | 6.18 | 6.70 | 3.60 | 5.26 | 40.96 | 5.51 | 1.16 | 2.51 |
| Shadow per actual prices ratio | 2003 | 3.13 | 0.90 | 0.89 | 11.70 | 2.08 | 0.89 | 2.77 | 1.93 |
| | 2002 | 2.82 | 1.37 | 0.83 | 5.26 | 2.10 | 0.98 | 1.16 | 2.51 |

Source: Author's calculations based on data from the Moscow Region farm registry (2002, 2003; unpublished).

Notes: The values are mean values. Actual prices are calculated using reported revenues and amounts of sales.

The greatest changes in shadow prices between the two years are observed for outputs measured in a monetary form. This is explained by structural changes in the composition of these outputs. The difference between shadow and actual prices of these outputs is larger than that of others. In the case of crop production other than grains, potatoes and vegetables is the largest. This effect can be caused by unavailability to the majority or farms of a specific technology (for instance, strawberry production) used by a single farm located at the production frontier. Hence, there is no reason to attach an economic meaning to this value.

The tests for robustness by means of changing the model specification show that the estimations presented in Tables 4 and 5 are robust enough to justify economic conclusions.

6 CONCLUSIONS AND DISCUSSION

- 1 The study presented in this paper argues that the behaviour of Moscow region corporate farms is close to revenue maximising behaviour, which is theoretically expected in the case of oligopoly. Having occupied a sizeable share of a regional market of agricultural production, each farm tends to keep this share occupied rather than to care about costs.
- 2 It is found that the revealed preferences are homogenous with respect to production patterns reflecting farm production specialisation, and display robustness to changes in the empirical model specification within the justified theoretical framework.

- 3 Increasingly widespread land scarcity compared to the late 1990s is an important positive change creating preconditions of efficient resource allocation. However, the estimations for 2003 show that the arable land shadow price growth was not caused by long-term processes that could be expected to persist under the absence of a purposeful land value policy. The lack of machinery has surpassed the problem of lack of sources of production cost financing, which was a central constraining factor of agricultural production in the first decade of market reforms in agriculture.
- 4 Since an oligopolistic behaviour results in lower outputs and higher consumer prices compared to a profit-maximizing behaviour, this study suggests seeking institutional improvements that would allow lower transaction costs, easier access to market information and a more competitive market environment. It should be noted that splitting existing production units can raise transaction costs instead of the expected positive impact on competitiveness. Alternatively, creating *new* farms, either corporate or family, due to capital inflow from other branches of the economy (for instance, from food processing enterprises lacking a resource base) might improve resource usage and increase competitiveness without a considerable negative influence on transaction costs.

Future studies of corporate farms utility is justified by the following problems that remain unsolved.

- 1 Although the variance of herd population utility proves that the difference of this utility component from zero is occasional, the uniform sign of this component within a year, as displayed in Table 3, suggests that in fact this utility component might be reliably different from zero, at least in some of the studied farms. It is important to provide a methodology that would allow identifying such farms. The possible significance of the herd population utility is also justified by the highly excessive (the excess is 2.07) empirical distribution of herd population utility. A theoretical base of possible significance for this utility component (at least for some farms) is a large time gap between making decisions about herd population and its effect, which makes expectations regarding the future effectiveness of milk production a noticeable factor of farm preferences. In this respect, the utility of herd population is a subject for more detailed study.
- 2 The results of this study allow another interpretation: The monopoly or oligopoly of suppliers might hinder the ability of farms to control their costs. This reasoning is in line with a position of many Russian agrarian economists, who stress a much higher rate of farm input price growth in farms in the most appropriate way. Although the production patterns approach is simple and handy, the strict evidence that it perfectly facilitates throughout the set of farms. Finally, there exists the problem of a grouping

technique which would reflect the availability of technologies to ported by the empirical model. Nevertheless, a detailed study of the relations between the studied farms and their suppliers seems to be necessary in order to ensure the validity of the foremost conclusion of this study.

- 3 It is possible that the utility of short-term loans is not reliably homogeneous within the studied data sets. The factors that could influence it need a special study. One of the possible factors is the relation between banks and farms, which are not uniform throughout the set of farms.
- 4 Finally, there exists the problem of a grouping technique which would reflect the availability of technologies to farms in the most appropriate way. Although the production patterns approach is simple and handy, the strict evidence that it perfectly facilitates the purpose it is engaged for is currently missing. Testing alternative grouping approaches is one more promising direction of future studies.

REFERENCES

- AMADOR, F., SUMPSI, J. M., ROMERO, C. (1998): A non-interactive methodology to assess farmers' utility function: An application to large farms in Andalusia, Spain, *European review of agricultural economics*, Vol. 1, pp. 95-109.
- BAUMOL, W. J. (1967): Business, behavior, value and growth, rev. ed., New York.
- BEZLEPKINA, I. (2004): Microeconomic analysis of Russian agricultural enterprises with special reference to subsidies and debts: PhD thesis, Wageningen Univ. and Research Center, The Netherlands.
- CHARNES, A., COOPER, W. W., RHODES E. (1978): Measuring the efficiency of decision making units, *European Journal of Operational Research*, Vol. 2, pp. 429-444.
- KUHN, H. W., TUCKER, A. W. (1951): Nonlinear programming, in: UNIV. OF CALIFORNIA PRESS (ed.): Proc. of 2nd Berkeley Symposium on Mathematical Statistics and Probabilistics, Berkeley, pp. 481-492.
- LIEN, G., HARDAKER, B. (2001): Whole-farm planning under uncertainty: Impacts of subsidy scheme and utility function on portfolio choice in Norwegian agriculture, *European review of agricultural economics*, Vol. 1, pp. 17-36.
- LOURIER, A. (1966): Abstraktnaja model' optimizacii narodnochozjajstvennogo processa i ob'ektivno obuslovlennye ocenki [A theoretical model of optimization of a national economy process and objectively defined costs], *Ekonomika i matematicheskie metody*, Vol. 1, pp. 12-30.
- SEROVA, E. (1999): Economic behaviour of the collective enterprises in transitional economy (Russian case) and policy implications, *Bulg. J. Agric. Sci.*, Vol. 5, p. 360.
- SVETLOV, N. (2002a): Chapter 4, in: SVETLOV, N. (ed.): Sistema matematičeskich modelej stoimosti: Metodologija, teorija, problemy sel'skogo chozjajstva [System of mathematical models of value: Methodology, theory, problems of agriculture], MTAA, Moscow, pp. 180-200, (in Russian).

- SVETLOV, N. (2002b): Factors affecting farm production in the Moscow Region, in: HINNERS-TOBRÄGEL L., JÜRGEN, H. (eds.): *Agricultural Enterprises in Transition: Parallels and Divergences in Eastern Germany, Poland and Hungary*, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 15*, Wissenschaftsverlag Vauk Kiel KG, Kiel, pp. 417-420.
- SVETLOV, N. (2004): Factors of technical and economic efficiency of corporate farms in Moscow region, paper presented at the mini-symposium "Agricultural transformation: Lessons from five transition countries", Wageningen/The Netherlands, 28.10.2004., <http://www.mansholt.wur.nl/mgs/publications/activitiespapers/041028%20Svetlov_minisymposium.pdf>.
- UZAWA, H. (1958): The Kuhn-Tucker Theorem in Concave Programming, in: ARROW, K. J., HURWICZ, L., UZAWA, H. (eds.): *Studies in Linear and Nonlinear Programming*, University Press, Stanford.

ORGANISATIONAL CHOICE

BUYING OR RENTING IN? SELLING OR RENTING OUT? EXPLORING CONTRACT CHOICE ON THE POLISH LAND MARKET

*ANNETTE HURRELMANN**

ABSTRACT

This article explores an issue which has been largely neglected in the explanation of land contract choice: Namely, what determines the choice between the sale and rent of land. The paper argues that it is not sufficient to look at transaction costs alone to understand farmers' and landowners' decisions, but that the "costs of exchange", i.e., the full opportunity costs connected with a contracting decision, must be taken into consideration. Thus, the impact of the additional benefits of land ownership (such as its function as insurance, storage of wealth, object for speculation and conveyor of status), which form one important element of decision-making, can be brought into the equation. The empirical investigation focuses on land contracting decisions of Polish family farms by analysing data from a survey, as well as three village case studies. The outcome is that farmers and landowners attach a high value to long-term security and the additional benefits of ownership, expressing a general preference to purchase and a reluctance to sell, respectively. Consequently, the land market is very tight and strongly contested. However, on the demand side there is also a strong influence against land purchase in the form of the high transaction costs involved in financing.

Keywords: *Land market, contract choice, costs of exchange, transaction costs, Poland.*

* Humboldt-Universität zu Berlin, Landwirtschaftlich-Gärtnerische Fakultät, Institut für Wirtschafts- und Sozialwissenschaften des Landbaus, Fachgebiet Ressourcenökonomie, Luisenstr. 56, 10099 Berlin, Tel.: 030 2093 6225, Email: AHurrelmann@aol.com.

1 INTRODUCTION

The choice between various types of tenancy contracts is one of the classical questions for economists studying contract choice and has brought forward a substantial body of theories to explain why fixed rent, wage labour and share tenancy contracts coexist. Rental arrangements have, thus, been treated in great detail and with numerous variations in the assumptions about human behaviour and environmental conditions. But surprisingly few economists have included in their land contract theories the more fundamental question of what influences a land user's or landowner's decision between renting land in (in any form) or buying it or, respectively, renting it out or selling it. It is this imbalance which prompts HAYAMI and OTSUKA's (1993, p. 177) statement that attempts to explain how the decision between different governance forms in land contracts "have so far been partial without considering the whole range of contract choice".

In this article I attempt to adopt a broader view on the issue by identifying and discussing various aspects of farmers' decision-making with respect to the question of whether to opt for the sale or rental of land. Some insights as to possible factors of importance can be gained from the rental contract literature, such as the necessity of paying attention to transaction costs, properties of the transaction and the separate choice process of landowners and buyers/tenants. The argument that credit restrictions may prevent farmers from buying land is also considered. Furthermore, the analysis pays attention to the additional functions that land performs (apart from being a factor of agricultural production) such as being a means of insurance and speculation as well as conveying power and identity.

In trying to capture and evaluate these differing influences, I make use of the idea that it is the total "costs of exchange", defined by BENHAM and BENHAM (2001, p. 4) as "the opportunity cost faced by an individual to obtain a specified good using a given form of exchange within a given institutional setting", which form the basis of the contracting decision of farmers and landowners. Thus, I hope to be able to contribute to a more complete picture of contract choice in land transactions in line with the demand that "we have to broaden our perspective on contract choice" (HAYAMI and OTSUKA, 1993, p. 177).

The remainder of this article is organised as follows. Section two elucidates the theoretical background by reviewing the most important arguments in the discussion of land contract choice and presenting the "costs of exchange" approach. The third section outlines the setting and methodology of the empirical investigation carried out in Poland. Section four presents and discusses the results of the data analysis. The article closes with the conclusions in Section five.

2 THEORETICAL APPROACH

The first part of this section briefly reviews the extensive literature on land rental. Furthermore, arguments on credit rationing, which is often considered to be the main obstacle for farmers seeking to buy land, are presented. Attention is also devoted to the notion that in addition to being a factor of production, land has other important functions. The second part of the section presents the theoretical concept used in this article to address the sale or rent question. It is based on the idea that the costs of exchange are the basis on which land contract choice is founded.

2.1 Land rental contracts, credit rationing and additional functions of land

ALLEN and LUECK (2002, p. 49) observe that "[o]ver the years economists have devoted an enormous effort examining the rationale for sharecropping"¹. The works are devoted to the question of what determines the choice between share tenancy, fixed wage and fixed rent contracts for land that cannot be cultivated by the owner alone. Sharecropping has long been believed to be an inefficient form of land cultivation, inferior to both fixed rent and fixed wage contracts because the tenant receives only a fraction of the marginal product of his labour and thus reduces his work effort if the landlord is unable to enforce work input (Marshallian view, cf. HAYAMI and OTSUKA, 1993, pp. 34-39). The fact that share tenancy exists and persists despite this alleged inefficiency has motivated a number of theories that explain why and under which circumstances sharecropping can be an efficient arrangement.

One set of explanations centres around various assumptions about the existence of risk and the attitudes towards it by tenant/worker and landlord, respectively (cf. CHEUNG, 1968; 1969). Other theories draw attention to the problem that work effort is not perfectly enforceable by taking into account transaction costs "broadly defined to include shirking, negotiation and enforcement costs due to both land and labour shirking" (TASLIM, 1992, p. 271) and costs due to the need for "specification and monitoring of output" (BARZEL, 1997, p. 49). These models explain contract choice either as a trade-off between risk-sharing and transaction costs (cf. CHEUNG 1969a; 1969b) or, assuming both parties' risk neutrality, as a minimisation of total transaction costs (cf. BARZEL, 1997; DATTA, O'HARA and NUGENT, 1986). Another group of models explains the selection of either fixed wage, fixed rent or sharecropping contracts with imperfections on other markets, such as credit (cf. LAFFONT and MATOUSSI, 1995) and labour (cf. RAY, 1999). ESWARAN and KOTWAL (1985) develop a double-sided moral hazard model focussing on the unmarketed inputs of labour supervision and management ability, which can only be obtained by involving the factor owner in the production

¹ For summaries of theories on sharecropping cf. OTSUKA and HAYAMI (1988) and TASLIM (1992). An overview is also provided in HURRELMANN (2002, pp. 43-61).

process. A fourth element considered is the use of contracts as screening instruments, either for the landlord to gain knowledge on the abilities of tenants/workers (cf. HALLAGAN, 1978) or for the tenant to gain information about land quality (cf. MURRELL, 1983).

ALLEN and LUECK (1992) regard the duration and content of land lease contracts in Nebraska and South Dakota. They point out that low asset-specificity and low insecurity due to a well-developed body of common law and close intimate knowledge between the contracting parties combine to reduce transaction costs to very low levels in land rental contracts and make very simple, vague and short-term contracts possible. BECKMANN (2000, pp. 165-170), the only author reviewed here who includes sale contracts into his explanation, works along similar lines by picking out the transaction cost effect of site- and land-specific investments. He argues that the value and duration of such investments determine the choice between different duration periods of rental and sale contracts.

As mentioned above, the focus of the models of contract choice presented lies almost exclusively on rental contracts, while the aspect of land sale is largely neglected. The most frequently used explanation as to why farmers would prefer renting in land over buying is taken from the discussion on credit rationing by banks, which suggests that small agricultural producers may face difficulties in financing land purchases. The phenomenon of credit rationing, explored by STIGLITZ and WEISS (1981), exists due to the fact that credit markets are characterised by imperfect information since the lender (principal) cannot fully assess the riskiness of a borrower (agent). This agency situation results in adverse selection because more risky borrowers are willing to pay higher interest rates due to the reduced likelihood that they will repay the loan at all. Thus, banks use interest rates as a screening device to distinguish between high and low risk borrowers and are unwilling to raise interest in case of excess demand, which results in credit markets not being cleared. Certain demanders, as a result, are credit constrained because they "cannot get the credit [they demand] at the prevailing contract rate [...] with the extent of the constraint given by the gap between the amount demanded and received" (BARHAM, BOUNCER and CARTER, 1996, pp. 794f). BARHAM, BOUNCER and CARTER (1996) point out that credit rationing associated with excess demand is likely to be wealth-biased because the transaction costs of providing credit to smallholders are much higher than that of providing credit to wealthier borrowers.

Where difficulties in financing and access to credit make land rental the preferable or the only feasible option for farmers seeking to increase their holdings, the problem may be intensified by disproportionately high land purchase prices. The reason for this price phenomenon is that land ownership offers advantages that go beyond the possibility of gaining income from cultivating the land. Thus, own land can serve as a means of accumulating wealth and transferring it between generations. This function is particularly important where no other opportunities

for saving and transfer exist, e.g. when the rural population is cut off from or unfamiliar with the banking system. Furthermore, land provides the option to be used as collateral for loans, and property ownership may offer tax advantages, opportunities for speculation and security as an inflation hedge. Apart from these economic functions, land plays an important social role in that it can convey high social status and political power and has an identity-giving meaning (cf. DEININGER and FEDER, 1998, pp. 1; 18; BARDHAN and UDRY, 1999, p. 61). All of these additional advantages are gained to their full extent only when land is actually owned, not when it is rented in. As a result, the special functions of land ownership are likely to become capitalised in land sale prices with the effect that they are higher than the capitalised rent (cf. BECKMANN, 2000, p. 171). Thus, even if farmers manage to obtain credit for land purchase, this loan can often not be repaid from agricultural profits alone, while rental payments for the same land could be met from this source.

2.2 The costs of exchange

Although the cropshare theories referred to above rely on different assumptions and focus on a variety of influencing factors and conditions, they can be found to contain one main, shared argument. This most frequently explored aspect is that the desire to minimise transaction costs plays a major role in farmers' and landowners' decision-making, which suggests that Transaction Costs Economics (TCE), with its focus on insecurity, asset-specificity and frequency as the most important sources of transaction costs, is a potent theoretical approach to be employed in the explanation of contract choice.

Another crucial point underscored in many contributions to the sharecropping literature is the need to regard the contract choice calculation from the side of landowners and that of tenants separately, because each acts according to his own preferences and factors of influence. Agreements, however, will only come into existence in a certain form if this is favourable for both parties. The need for a differentiated analysis of the behaviour of both transaction partners applies similarly in the case of the choice between sale and rental contracts and is an important element in the theoretical approach and empirical investigation in this article.

With respect to transaction costs, I choose to follow the rather restrictive classification of FURUBOTN and RICHTER (1998, p. 43f.), who differentiate between market transaction costs, managerial transaction costs and political transaction costs. Within the market transaction costs category, costs are further divided according to the sort of activity within the contracting process on the markets that causes them, creating the groups of *search and information costs*, *bargaining and decision costs* and *supervision and enforcement costs*. For the topic of this work, it is important to realise that it is possible to treat the credit rationing

argument within the transaction cost framework by considering the costs that arise during the process of demanding credit and supervising agreements.

BENHAM and BENHAM (2001, p. 4) stress that the measurement of transaction costs poses a problem since there exists a difficulty in differentiating transaction costs from the costs of the good itself: "Estimation is problematic because production and transaction costs are jointly determined" (cf. also BECKMANN, 2000, pp. 39-42). In order to overcome both this and the transaction cost measurement problem, they propose a related measure for costs, referred to as "costs of exchange", which represents the full opportunity costs of an individual's choice, i.e., the price of the good itself and the transaction costs the actor incurs in obtaining the good.

I employ the "costs of exchange" concept as inspiration in the context of this investigation because I am convinced that it can be used to capture many aspects of farmers' and landowners' calculations in land market decision-making that are extremely important and cannot be explained by Transaction Cost Economics alone. The original idea of BENHAM and BENHAM (2001) is slightly extended in this work for two reasons demanded by the subject matter. First, due to the fact that the issue addressed here concerns a resource and factor of production, while the original approach only explicitly addresses the market for goods and services, the sources for opportunity costs considered have to be widened. Thus, in order to arrive at the total costs of exchange in a land transaction, the "worth" of the additional functions of land ownership must be taken into account by reversing them into the opportunity costs of *not* attaining or losing ownership. Second, since this article sets out to study the choices of both those demanding and those supplying land, while BENHAM and BENHAM (2001) consider only costs for obtaining a good for the demand side, two independent cost calculations must be regarded here.

On the demand side, the costs of exchange for purchase (p) or renting in (ri) on land markets are assumed to be composed of three elements. These are the (rental or purchase) price of land, the transaction costs (TC) connected with the transaction and the other opportunity costs created by the exchange:

$$\text{Costs of exchange}_{p,ri} = \text{Land price}_{p,ri} + \text{TC}_{p,ri} + \text{other opportunity costs}_{p,ri}$$

As stated above, the transaction costs of demanders may include, among other things, the expenditures connected with financing a possible land purchase. Among other opportunity costs are the benefits forgone by making the contracting choice. Thus, a farmer who rents in instead of buying loses the opportunity to gain, for example, the insurance or speculation function of one's own land. A farmer who buys does not have these costs directly, but the purchase price he pays may reflect some of them and be high in comparison to rent. Furthermore, there is another aspect connected with credit and financing contained in the other opportunity costs of the buyer in that he always – but probably particularly

strongly in purchase – faces the opportunity costs connected with not having invested his money in an altogether different area.

For the supply side, the calculation of the costs of exchange when selling (s) or renting out (ro) contains only the elements of transaction costs and other opportunity costs:

$$\text{Costs of exchange}_{s, ro} = TC_{s, ro} + \text{other opportunity costs}_{s, ro}$$

The other opportunity costs, here, are of a complex nature because they include not only the costs of the loss of additional functions of land ownership in the case of sale, but also capture forgone opportunities with respect to price as well as the investment of money received in case of sale. Thus, if land is rented out and the capitalised rent does not equal the price alternatively gained through sale, the difference must be counted as an element of opportunity costs. This shows that, even within the category of other opportunity costs, landowners must weigh two positions of costs against each other in order to establish their costs of exchange. It should be pointed out that the term "costs of exchange" is slightly misleading here, since the calculations presented above also represent the "costs of non-exchange", i.e., the costs encountered when the demand or supply side do *not* carry out any land transactions.

A final word should be dedicated to the role of the institutional environment. Quite obviously, both legal regulations (e.g. by granting tax exemptions or preferential credit in the case of purchase) and informal norms and customs (e.g. by establishing higher esteem for purchase than rental) can have a considerable effect on the costs of sale and rent. The reason why the institutional setting is not explicitly included as a factor in the cost calculations, despite this undoubted influence, is that most of its consequences for the costs of exchange are in fact already captured in the existing categories price, TC and other opportunity costs.

3 EMPIRICAL SETTING AND METHODOLOGY

The empirical investigation was carried out in Poland, in two structurally different areas representing the contrast between a prosperous region and one that has fallen behind in agricultural and general economic development. The first area, the territory of the former voivodship Poznan in western Poland, is characterised by a diversified and dynamic economy with an important share of industrial output, and by agricultural production in individual family farms larger than the national average and with some degree of specialisation. The second area, the former voivodship Sieradz in central Poland, shows relatively poor general economic performance and a dominance of rather small and unspecialised family farms.

The empirical study draws on two sources of information: The first is a survey of farms where quantitative data was collected, while the second source is three village case studies that yielded qualitative data. The timeframe covered in both sources are the years since the system change in Poland in 1989.

The survey data, which contains observations on 111 family farms in the voivodship Poznan and 110 in the voivodship Sieradz, was collected as part of the larger research project KATO in 1999². The survey data covers general aspects of farm structure, production and inputs and was analysed by means of simple descriptive statistical procedures.

The three village case studies were carried out in autumn and winter 2003, with two being conducted in the Poznan region (villages referred to as P1 and P2 in the following) and one in the Sieradz region (referred to as S). P1 is a village composed mainly of commercially-oriented family farms that are rather large by Polish standards, (farms where interviews took place comprised, on average, 26 ha) and which specialise in pig rearing and arable production, including sugar beet and vegetables. A production cooperative exists in the village and has been losing members – and with them their land – as well as selling off its own land since 1989. P2 is a neighbouring village of P1, where large family farms (average 33 ha, specialised as in P1) coexist with a commercial Spanish enterprise that bought and rented land during the privatisation of the former local state farm and which produces asparagus and strawberries. The specialisation of farms is similar to the situation in P1. S is a village consisting only of private family farms, which are rather small (average 14 ha) and in most cases unspecialised.

In the three villages, as many family farmers and private landowners as possible were interviewed (altogether, 37 interviews were carried out) with a questionnaire composed of open-ended questions based on a manual that addressed various areas of land market activity. For the analysis of case study data, a transaction databank was produced that contained information on every land transaction carried out by the interviewed farmers/landowners detailing the type of transaction (sale/rent), the transaction partner, the reason for carrying out the transaction, the time and effort involved in closing the transaction, etc.

4 RESULTS AND INTERPRETATION

The discussion of results is divided into three subsections. The first focuses on the credit rationing argument with respect to the Polish case; it draws mainly on evidence gained from studies on the situation of rural financial markets in Poland

² KATO studied privatisation, liberalisation and restructuring in the agricultural sectors of Poland, the Czech Republic and Bulgaria (cf. HANISCH et al., 2001). For details on the family farm data collection, see ZILLMER, 2002.

and extracts possible impacts on the choice between sale and rent. In the second subsection, the survey data is analysed. General trends in the land purchase/sale and renting in/renting out behaviour of farmers and landowners are shown and initial explanations for these observations proposed. Subsection three goes deeper into investigating the rationale behind decisions through evidence gained in the case studies. In doing so, it focuses on the impact of different elements of the costs of exchange, i.e., transaction costs, price and other opportunity costs on the demand for land, as well as the land supply side.

4.1 Evidence for the credit argument

There is ample evidence that Polish farmers face the problem of being credit constrained and also encounter additional difficulties concerning borrowing. While my own work yields few insights into the functioning of the Polish credit market and farmers' borrowing behaviour, it draws on important results from research on these topics by the WORLD BANK (2001), PETRICK (2002; 2004), PETRICK and LATRUFFE (2003) and LATRUFFE (2004). All of these studies, however, look at credit access in general, and not specifically for the purpose of land purchase.

To briefly summarise, the information gained through these detailed analyses of the Polish rural credit market is that credit rationing and high borrowing costs are likely to have the effect of making it difficult and sometimes even impossible for farmers to borrow money in order to make investments. Small farmers are especially affected by this situation. Together with limited household savings and the rare occurrence of informal lending that the studies report, this situation could be expected to influence the decision of Polish farmers towards land rental rather than purchase, since renting land does not require access to large amounts of money at once and saves the related high expenditures due to transaction costs.

4.2 Results from the analysis of survey data

A first look at observations from the survey data on family farms in Poznan and Sieradz seems to support this assumption insofar as renting is found to be much more important for increases in family farm sizes between 1989 and 1998 than purchase. Thus, the amount of farms' owned land has grown by +0.28 ha (+0.40 ha for Poznan and +0.16 ha for Sieradz) and the amount of rented land by 1.11 ha (1.99 ha for Poznan and 0.24 ha for Sieradz). However, these numbers have to be regarded bearing in mind that they do not provide any information on the question of whether the driving force behind the higher incidence of rental over sale transactions is, indeed, the demand side, or is, in fact, the supply side of the market. Interestingly, the source of the majority of rented land is other private farmers, while the privatisation agency AWRSP plays a very limited role. The difference between the two studied regions is striking, as Poznan

farmers have not only increased their holdings to a much larger degree, but have also achieved a higher proportion of this increase through renting land in than have their counterparts in Sieradz.

In the survey, predominantly active farmers were interviewed, while very few individuals who gave up farming and sold or rented out their whole estate were included. The possibility of gaining information on the decision-making of land-owners who want to stop farming is limited, but some clues can be taken from the answers to a question that asks farmers about their future plans for land market activities. The results confirm the generally higher level of (planned) activity in the Poznan region, as in Sieradz, 71 % of all farmers do not plan any transactions against only 56 % in Poznan. For the rental market, there is a uniform trend in the whole sample, and both regions, that the supply of land for rent will be higher than the demand (in number of transactions) if the planned activities are realised. With respect to the sales market, the overall situation is exactly the opposite: Demand to buy will be higher than the willingness to sell. Notably, this discrepancy is very strong in Poznan, but reversed in Sieradz, where plans to sell are more common than to buy.

Table 1: Perception of problems in land purchase and rental

| Problem ^a | Whole sample (n=221) | | Poznan (n=111) | | Sieradz (n=110) | |
|--|------------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| | Land purchase (median) | Land rental (median) | Land purchase (median) | Land rental (median) | Land purchase (median) | Land rental (median) |
| No land on offer in the area | 3 | 4 | 2 | 3 | 4 | 5 |
| Purchase/rental price too high | 3 | 4 | 3 | 3 | 3 | 4 |
| Too many competitors | 4 | 4 | 4 | 4 | 5 | 5 |
| Difficulties in obtaining information | 5 | 5 | 5 | 5 | 5 | 5 |
| Personal contacts to key persons needed | 5 | 5 | 5 | 5 | 5 | 5 |
| Lack of legal titles, legal insecurity | 5 | 5 | 5 | 5 | 5 | 5 |
| Lack of capital/renting in does not make sense | 2 | 2 | 2 | 3 | 2 | 2 |

Source: Own presentation based on KATO survey data.

Notes: ^a Evaluated on a scale of 1=very big problem, 2=big problem, 3=some problem, 4=relatively unproblematic, 5=no problem.

Interestingly, this information does not fit with the idea that the land demand side is generally discouraged from wanting to purchase by the problem of credit rationing or lack of access to financing. It shows that a large number of farmers is interested in buying despite these difficulties and that the share of those planning to buy is substantially higher than those planning to rent in. On the supply side,

the situation is less clear, as Poznan landowners favour the option of renting out over selling, while their Sieradz counterparts have a strong preference for selling. It is possible that these numbers reflect the particularly poor economic situation of some of the generally smaller Sieradz farms, as well as the demographic factor that Sieradz farmers in the sample are, on average, older than farmers from Poznan. The findings indicate that in Sieradz, the reasons for few sales of land may be the demand side (possibly influenced by difficult access to financing) rather than the supply side.

Table 1 presents the perceptions of the respondents concerning problems expected when carrying out land purchase and land rental transactions. Considering the land market from the perspective of the (potential) land demand side, it supports the assumption of a better position of demanders on rental than on sales markets, because problems with respect to lack of land on offer are considered less severe when wanting to rent in than when wanting to buy. This perception applies to both sample sections as well as the whole. The observations on difficulties with prices point in the same direction, since, according to market logic, higher prices indicate greater scarcity and the perception that "prices are too high" is stronger in purchase than rental. The numbers underscore that sale and rental markets are more actively contested in Poznan than in Sieradz – in fact the discrepancy of two points each in "no land offered" is remarkably high. This is in accordance with the information of greater willingness to sell and rent out than buy and rent in in Sieradz. A lack of capital is evaluated as the greatest problem of all in land purchase transactions, which supports the validity of the studies quoted above, which find problems concerning financing, credit rationing and access to capital in Poland.

4.3 Results from the analysis of case study data

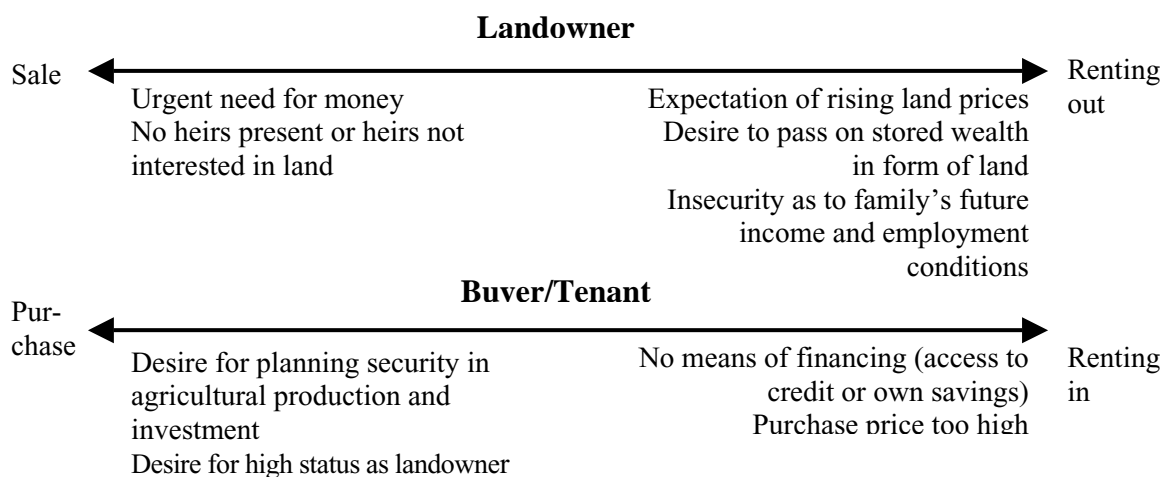
Figure 1 provides a summary of the reasons that were mentioned in the case study interviews by landowners on the one hand, and buyers/tenants on the other, as determinants in their choice between sale and rent of land. In order to make sense of this information within the costs of exchange approach, I will differentiate the elements according to the cost category they represent.

As far as *transaction costs* are concerned, they play a major role and may even be prohibitively high where the costs of access to financing are regarded. It is remarkable, however, that as far as the search for and bargaining with the other side of the transaction are concerned, transaction costs differences between sale and rent are not mentioned, and, thus, do not seem to have a strong influence. The costs that accrue after rental contracts are closed, e.g. for the supervision, enforcement and adjustment of contracts, appear equally low and largely irrelevant for decision-making. The main reason for this finding is likely that insecurity and the danger of opportunistic behaviour are rather low in the studied cases due to the intimate knowledge between contracting parties in a village-community

setting (cf. HURRELMANN, 2004; ALLEN and LUECK, 1992). As a result, transaction cost differences between sale and rent that are caused by impacts other than financial difficulties are so small for both suppliers and demanders that they are negligible in explaining contract choice between sale and rent.

The *land price* is of importance since a sales price that is considered "too high" can prevent purchase. Unfortunately, the role of prices in general remains shadowy since it is hard to establish whether and to what extent other benefits are captured in land prices. This could concern the additional functions of land gained through ownership, which would increase sales prices. It could also reflect the meaning of rental as passing land into temporal use and care for a transitory period (e.g. until heirs are willing to take over the farm), which would suppress rental prices. The discrepancies between the often merely symbolic prices for rental and the substantial prices for sale suggest that such an effect is present, but the current work is unable to specify it in detail.

Figure 1: Determining factors in the choice between sale and rent



Source: Own presentation.

Most of the factors mentioned as decisive for decision-making come from the category of *other opportunity costs*. On the demand side, the security provided by land ownership for current and future production, as well as investments in the enterprise, is valued very highly by the respondents. Generally, the advantages of ownership are believed to outweigh the connected difficulties of access to finance and relatively high prices to be paid in sales transactions. Another reason for buying is that own land increases the status of a farmer much more than rented land. For suppliers, very strong reasons against selling are the desire to keep the insurance function provided by own land in case the economic condition of the family declines, the storage function that allows wealth in the form of property to be passed on and the speculation function that allows them to wait for higher land prices in the future. Even old landowners who give up production without passing the land on to successors tend to hesitate to sell because they are

afraid of losing these additional benefits connected with land ownership. Opportunity costs that suggest selling, in contrast, are the consequences of not receiving money when it is urgently needed in a difficult financial situation, or being stuck with an estate when it is clear that no heir is present or interested in taking over the farm.

These insights are in line with the two main observations extracted from the survey data; namely, that sale markets are more contested than rental markets and that the degree of contest on sale markets is lower in Sieradz than in Poznan. Responsibility for the first point is attributed to the extreme import of the opportunity costs, which speak in favour of land ownership. This holds for both the demand and the supply side, leading to the situation that landowners are reluctant to sell their land, while active farmers prefer purchase over renting in. The result of this is a sales market with excess demand, making land purchase difficult for farmers, and a rental market with excess supply, forcing landowners to offer favourable conditions to tenants. On the whole, sale and rental prices do not seem to fully internalise these conditions and do not, therefore, produce balanced markets with matching demand and supply. The differences between the two studied regions can be explained through the poorer economic conditions of farms in Sieradz, which serves to reduce demand for land purchase since small farms have particular problems with access to finance and increasing land sales, since many farmers urgently need the money to meet current expenses or pay debts. This leads to the situation that the imbalance between demand and supply on the sales market in Sieradz is less pronounced than in the more affluent Poznan. Interestingly, the effect is not mirrored in higher demand on Sieradz's rental market, which can be attributed to the scepticism in this area that "renting does not make sense". It is likely that the frequent inability of farmers to buy and the non-acceptance of renting in as an alternative in Sieradz is one factor contributing to the generally lower level of transaction activities than in Poznan.

5 CONCLUSIONS

The study presented in this article shows that the choice between sale and rent of land is a complex decision, involving a comparison of different kinds of costs and benefits accruing from contracting alternatives – and this is not only calculated according to current, but also future developments, states of production and needs of the family. Although the abundant literature on rental contract choice provides some clues for answering the question of what influences the sale versus rent decision, it alone is not able to provide a satisfactory answer. This is mainly because land ownership conveys special advantages that do not exist in rental but form an extremely important element of decision-making in the issue regarded here. Furthermore, financial aspects that play a peripheral role in rental decisions are of crucial importance where sale is regarded, which

makes it necessary to devote attention to the transaction cost effect of access to capital. In order to adequately consider all these aspects, it was decided to regard the contracting decisions of landowners and farmers as a result of the attempt to minimise the total costs of exchange, i.e., the full opportunity costs caused by the actor's choice of a particular contract. This measure allowed the study to take account of the fact that transaction costs form only one factor in the calculations of landowners and buyers/tenants, and that land price effects, as well as the benefits resulting from different contracts – or, formulated in a cost-framework, the opportunity costs of not making another kind of contract – also play a role.

ACKNOWLEDGEMENTS

I thank Dr. Volker Beckmann for helpful comments on an earlier version of this article. Financial support for my research from Studienstiftung des deutschen Volkes and the German Academic Exchange Service (DAAD) is gratefully acknowledged.

REFERENCES

- ALLEN, D. W., LUECK, D. (1992): The "Back Forty" on a handshake: Specific assets, reputation, and the structure of farmland contracts, *The Journal of Law, Economics and Organization*, 8 (2), pp. 366-375.
- ALLEN, D. W., LUECK, D. (2002): The nature of the farm: Contracts, risk, and organization in agriculture, The MIT Press, Cambridge/London.
- BARDHAN, P., UDRY, C. (1999): Development microeconomics, Oxford University Press, Oxford.
- BARHAM, B. L., BOUCHER, S., CARTER, M. R. (1996): Credit constraints, credit unions, and small-scale producers in Guatemala, *World Development*, 24 (5), pp. 793-806.
- BARZEL, Y. (1997): Economic analysis of property rights, Cambridge University Press, Cambridge/New York/Melbourne.
- BECKMANN, V. (2000): Transaktionskosten und institutionelle Wahl in der Landwirtschaft: Zwischen Markt, Hierarchie und Kooperation, Edition Sigma, Berlin.
- BENHAM, A., BENHAM, L. (2001): The costs of exchange, THE RONALD COASE INSTITUTE AND WASHINGTON UNIVERSITY IN ST. LOUIS (eds.): *Working Paper*.
- CHEUNG, S. N. S. (1968): Private property rights and sharecropping, *Journal of Political Economy*, 76, pp. 1107-1120.
- CHEUNG, S. N. S. (1969): Transaction costs, risk aversion, and the choice of contractual arrangements, *The Journal of Law and Economics*, 12, pp. 23-42.
- DATTA, S. K., O'HARA, D. J., NUGENT, J. B. (1986): Choice of agricultural tenancy in the presence of transaction costs, *Land Economics*, 62 (2), pp. 145-158.

- DEININGER, K., FEDER, G. (1998): Land institutions and land markets, *World Bank Working Paper 2014*, Washington.
- ESWARAN, M., KOTWAL, A. (1985): A theory of contractual structure in agriculture, *The American Economic Review*, 75 (3), pp. 352-367.
- FURUBOTN, E. G., RICHTER, R. (1998): Institutions and economic theory: The contribution of the New Institutional Economics, The University of Michigan Press, Ann Arbor.
- HALLAGAN, W. (1978): Self-selection by contractual choice and the theory of sharecropping, *Bell Journal of Economics*, 9, pp. 344-345.
- HANISCH, M., BECKMANN, V., BOGER, S., BREM, M. (2001): In search of the market: Lessons from analyzing agricultural transition in Central and Eastern Europe, paper presented at the 10th EAAE Congress "Exploring Diversity in the European Agri-Food System", Zaragoza/Spain, 28.-31.08.2002.
- HAYAMI, Y., OTSUKA, K. (1993): The economics of contract choice: An agrarian perspective, Clarendon Press, Oxford.
- HURRELMANN, A. (2002): Land markets in economic theory: A review of the literature and proposals for further research, Shaker, Aachen.
- HURRELMANN, A. (2004): Analysing agricultural land markets as organisations: An empirical study in Poland, HUMBOLDT UNIVERSITY OF BERLIN, DEPARTMENT OF AGRICULTURAL ECONOMICS AND SOCIAL SCIENCES, CHAIR OF RESOURCE ECONOMICS (ed.): *ICAR Discussion Paper 3/2004*.
- LAFFONT, J.-J., MATOUSSI, M. S. (1995): Moral hazard, financial constraints and sharecropping in El Oulja, *Review of Economic Studies*, 62, pp. 381-399.
- LATRUFFE, L. (2004): Investment and financial constraints of Polish farms, paper presented at the AES Annual Conference, Imperial College, London, 02.-04.04.2004.
- MURRELL, P. (1983): The economics of sharing: A transaction cost analysis of contractual choice in farming, *Bell Journal of Economics*, 14, pp. 283-293.
- OTSUKA, K., HAYAMI, Y. (1988): Theories of share tenancy: A critical survey, *Economic Development and Cultural Change*, 37 (1), pp. 31-68.
- PETRICK, M. (2002): Farm investment, credit rationing, and public credit policy in Poland: A microeconomic analysis, *IAMO Discussion Paper No. 43*, Halle (Saale).
- PETRICK, M. (2004): A microeconomic analysis of credit rationing in the Polish farm sector, *European Review of Agricultural Economics*, 31, pp. 23-47.
- PETRICK, M., LATRUFFE, L. (2003): Credit access and borrowing costs in Poland's agricultural credit market: A hedonic pricing approach, *IAMO Discussion Paper No. 46*, Halle (Saale).
- RAY, T. (1999): Share tenancy as strategic delegation, *Journal of Development Economics*, 58, pp. 45-60.
- STIGLITZ, J. E., WEISS, A. (1981): Credit rationing in markets with imperfect information, *The American Economic Review*, 71 (3), pp. 393-410.
- TASLIM, M. A. (1992): A survey of theories of cropshare tenancy, *The Economic Record*, 68 (202), pp. 254-275.

WORLD BANK (2001): Poland: The functioning of the labor, land and financial markets: Opportunities and constraints for farming sector restructuring, THE WORLD BANK (ed.): *Report No. 22598-POL*, Washington.

ZILLMER, S. (2002): Arbeitsangebotsverhalten im Transformationsprozess: Eine empirische Analyse des polnischen Agrarsektors, Shaker, Aachen.

THE ORGANISATION OF BUYER – SUPPLIER RELATIONS IN THE FOOD CHAIN: THE CASE OF THE GERMAN FRUIT PROCESSING INDUSTRY AND POLISH FARMERS

KAI MAACK*

ABSTRACT

Procurement in the German fruit processing industry has been characterized by an uncertain supply situation and rising costs for years. Berries processed for canned products, jam and fruit preparation for the dairy industry are almost exclusively imported from the CEEC, in particular from Poland. The cultivation of berries in Poland is characterized by strong fluctuations in yield, acreage and prices, which affects procurement costs. Vertical contractual agreements can substantially reduce these fluctuations. In principle, Polish farmers are interested in co-operating with the processing industry. One prerequisite for successful, ongoing co-operation is the well-balanced distribution of risks and risk premiums between the farmer and processor. This is necessary because berry production is characterised by a high initial investment, an unproductive first year (or years) of cultivation and a long pay-off period.

Keywords: Poland, Germany, berries, processing industry, organisational arrangements.

1 INTRODUCTION

Germany's degree of self sufficiency in berry fruits for processing has traditionally been extremely low; estimates range from 1 % to 5 % depending on the sort. Berries processed for canned products, jam and fruit preparation for the dairy industry are almost exclusively imported from the CEEC, in particular from Poland. Since the end of the 1980s, supply and prices have heavily fluctuated due

* Institute of Economics in Horticulture, Market Analysis and Agricultural Policy, University of Hannover, Germany, Email: maack@ifgb.uni-hannover.de.

to problems in the transition processes of these economies, especially institutional and organisational failures such as lack of market information, breakdown of former state-owned marketing boards and large-scale berry production, uncertain contract performance by small-scale, often part-time farmers. The reasons for varying quantity and prices are seen, on the one hand, in missing cultivation contracts and co-operation between farmers and processing, and on the other hand in the short-term-orientated procurement function of the processing industry (SWIETLIK, 2004; GALIZZI and VENTURINI, 1999). A close and long-term co-operation makes the realization of capability and cost potential possible (HARTMANN, 1994). A requirement for this, however, is a suitable co-operation plan, with a well-balanced distribution of risks and risk premiums, which provides efficient incentives for the participants involved (FISCHER, 1993).

The study thereby concentrates on the market transactions between Polish producers and the German fruit processing industry, as Poland is the largest supplier of berries for the German processing industry. Since vertical contractual co-operation still rarely occurs in the processing industry, the specific production conditions for berries are pointed out, as are those conducive to a durable vertical co-operation. In addition, this study provides a missing overview of the market structures of the German fruit processing industry and of the Polish berry market.

2 METHODS

The lack of statistical data regarding berry industry procurements and finished products prevents a precise overview of the processing industry. However, conclusions from available official and unofficial information, from personal interviews of parties involved in the production-marketing system and from expert opinions of food technologists familiar with the sector allow the description of market structures and provide valuable information on business relations between the fruit processing industry and farmers. In addition, 10 in-depth interviews were held with representatives of Polish co-operations. Due to the complexity of the problem, a qualitative research design was deemed appropriate. The results were qualitatively evaluated using organizational-theoretical approaches, in particular behavioural scientific approaches.

3 MARKET STRUCTURES AND GENERAL INFORMATION REGARDING THE PROCUREMENT AND CULTIVATION OF BERRIES

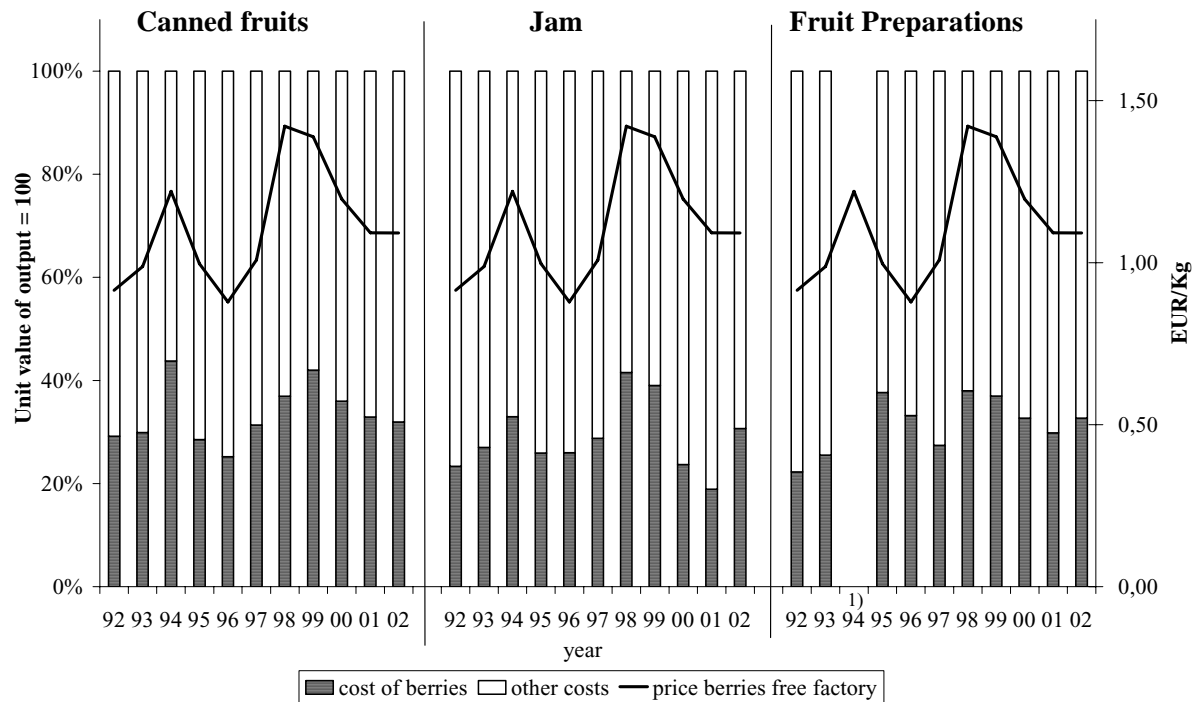
Poland produces, on average, about 500,000 tonnes of berries per year, over 70 % of which are sold to the processing industry. Poland is the major supplier of berries for the German processing industry.

3.1 Fruit processing industry in Germany

The value of production of canned fruits, jam and fruit preparations amounted, in 2002, to about 1.1 b. EUR; scarcely half of this amount was finished products from berries. The market for processed fruit products is oligopolistic. Due to structural transformations, the number of individual manufacturers of jam and canned fruits has fallen in recent years, to approximately 28 in 2002 (BOGK, 2002; WERNER, 2000). Two large manufacturers comprise approximately 70 % of the jam market, which points to a large concentration of buying power in relation to farmers. Fruit preparations are produced by only 10 large enterprises, the output of which is approximately as high as the production of jams and canned fruits. The highest quality of fruit is needed to produce canned fruits, whereas fruit preparations are subject to less restrictive quality requirements. Further investigation into the product assortments of the three categories reveals that in terms of quantity, approximately 15 %, 55 %, and 65 % of the total production of canned fruits, jam and fruit preparations, respectively, contains berries as input material. Total supply needs are estimated to be approximately 130,000 tons per year, made up of 40 % strawberries and 20 % raspberries (SCHMIDT and MAACK, 2001). Of the berries processed, 9 %, 47 %, and 44 % goes to the canning industry, jam, and fruit preparations, respectively. The costs for berries in berry-containing cans, jam, and fruit preparations accounts for 34 %, 32 %, and 28 %, respectively, of the unit price for finished products, emphasising the strong dependency on berry prices (Figure 1). This is especially true with respect to canned fruits, for which quality requirements are much higher than for other product categories; berries of high quality get a higher premium in years of short supply. Figure 1: Reveals one additional fact pertaining to the competitive position of the industry: Combining the time series of the cost/shares breakdown with the time series of the import unit value of berries shows a significant positive correlation (the coefficients of determination were 0.73, 0.96, and 0.86 for cans, jam and fruit preparations, respectively). Clearly, the industry is not able to shift price increases to consumers, whereas price reductions are shifted to the demand side without any time lag. This situation corresponds to the well-known countervailing power of the food retailing system in Germany, and again confirms that the industry is highly vulnerable to price and supply fluctuations. The importance of supply shortages is readily apparent when a company is not able

to provide finished products in terms of the quantity and price demanded; it will inevitably be excluded from the supplier list, and it is extremely hard to re-establish such business relations.

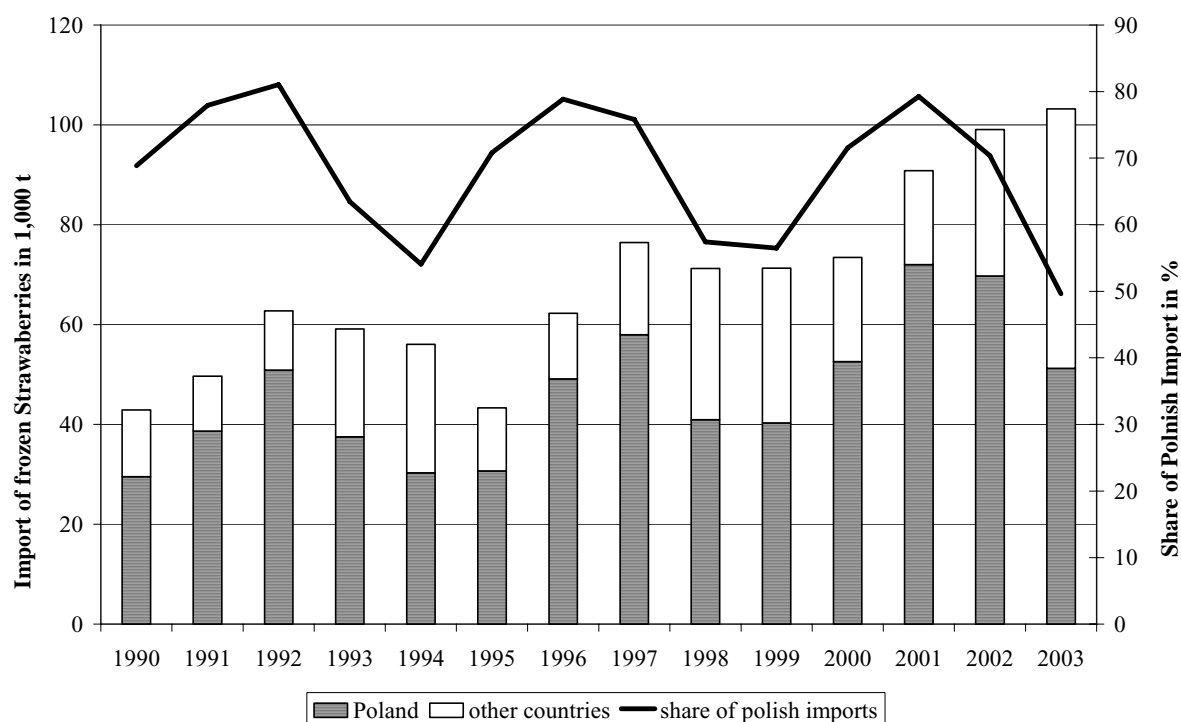
Figure 1: Share of berry costs in average value of production



Source: BOGK; SCHMIDT and MAACK, 2001; IERiGZ and own calculations.

Note: ¹⁾ No dates available.

For technical and logistic reasons, the industry mainly uses frozen berries, the share of which amounts to about 90 % of all processed berries, and of which Poland is by far the largest supplier. The share of Polish frozen strawberries amounted, in the last 10 years, to between 60 % and 70 %, and in individual years even to about 80 % (Figure 2). Imports increased, from about 30,000 tons in 1990 to 70,000 tons in 2003, which is justified mainly by the increased need in producing fruit preparations. These figures confirm the high degree of dependency of the processing industry on the supply of berries as a raw material.

Figure 2: Imports of frozen strawberries to Germany

Source: GUS; SCHMIDT and MAACK, 2001; IERiGZ and own calculations.

3.2 Fruit processing industry in Poland

The food industry is one of the most important sectors of the Polish economy in terms of the volume of production sold (over 20 % of total sales value), number of industrial establishments (about 30,000) and employment (411,000 people, i.e., 8.4 % of total national employment, and about 16 % of total industrial employment). Fruit and vegetable processing is extremely dispersed and currently includes between 1,400 and 1,500 processing plants. About 90 % of the processing plants are small and employ between 1-50 people. The proportion of large processing companies is about 5 % of the total number of processing plants.

Since the majority of berries are imported frozen, the Polish freezers play a particularly important role. Since 1989, the centrally-planned and owned Polish food processing industry has been successfully privatized, and foreign companies have majority ownership in nearly all sectors of the Polish food industry. The processing industry significantly gained during these political changes. Traditional fruit and vegetable processing in Poland is characterized by a small structure (BWA, 2002). The food processing sector is becoming more concentrated as less efficient companies close down. In the Polish cold freezing industry, about 200 enterprises are active, of which fewer than 100 enterprises freeze fruit – a figure with a decreasing tendency (SCHWIERZ, 2000). Growth in the Polish food processing sector, through improved technology and production quality, is hampered by serious problems, including: Shortage of domestic capital; an unstable

raw material base in the case of many industrial establishments (loss of contract links with raw material suppliers); lack of strong processors' groups; crop dispersion; the lack of cold storage, and the lack of a homogenous quality of raw materials. The structural differences between the Polish food economy and the European Union are significant, and convergence will take many years (BWA, 2002).

3.3 Structure of the Polish berry production

After the political transformation, fruit production did not experience drastic changes as state-owned enterprises became private, in contrast to industry and trade. This was because of the low share, about 20 %, of state-owned enterprises in fruit production. Also, the agricultural production cooperatives which were created by order of the communist government never became as important as in most other CEEC. In 1988, 2,086 agricultural production cooperatives were farming 2.8 % of the arable land and had 177,000 members. Their productivity was, to some extent, comparable to that of state farms, although usually slightly higher, as a few aspects of private ownership were maintained. Besides these production-oriented cooperatives, there were four distinct types of "cooperatives" in the communist period: Peasant self-aid supply and marketing cooperatives, dairy cooperatives, horticultural co-operatives and agricultural cooperatives (KOWALAK, 1993). The objective of these cooperatives was closer to the principles of a real cooperative. Though the members could not freely decide under the communist regime, the support/marketing functions of these cooperatives were useful. For Polish berry production, horticulture cooperatives were the most important association. In 1988, 140 horticulture cooperatives produced fruits and vegetables and had a very strong position on the home market (about 50 % of the total turnover) (KOWALAK, 1993), and affiliated 372,600 individual farm owners producing fruit, vegetables and honey. Their main function was to market fruit, vegetables and honey produced by their members and to supply member farms with inputs and special services. They also rendered consulting services, and organized training courses for members and employees, as well as exhibitions. These co-operatives employed 55,500 persons, owned and ran 6,500 shops, over 1,100 fruit and vegetable collection points and 210 processing plants. Their specialized foreign trade enterprise had a virtual monopoly on the export of fruit, vegetables and honey. The communist regime also violated the abiding principles of cooperatives in a number of ways, such as the imperative of meeting central-planning objectives which in essence eliminated the right of cooperatives to make their own decisions. After the beginning of transition in 1989, the impact of these cooperatives fell and thus, so did interest in being their member. Unlike other cooperatives, the horticultural cooperatives did not establish a national organisation to take over the advisory and other functions from the Central Union. In 2000, the number of members dropped to 90,000 with a

market share of only 8 %. But besides the old form of co-operations, new forms were established, which are usually engaged in very basic activities, i.e., collecting and marketing (VAN BEKKUM and SCHILTHUIS, 1999).

Table 1: Number of Polish farms producing berries (2002)

| | Total | Up to 1ha | 1-2 | 2-5 | 5-10 | 10-15 | 15-20 | 20-30 |
|--------------|--------|-----------|-------|-------|------|-------|-------|-------|
| Currants | 82000 | 75000 | 1400 | 2000 | 621 | 160 | 50 | 89 |
| Raspberries | 50000 | 48000 | 1600 | 400 | - | - | - | - |
| Strawberries | 196000 | 99000 | 77000 | 13000 | 5000 | 1700 | 200 | 100 |

Source: MAKOSZ, 2004.

Because of the great share of private land, the greatly-dispersed structures of land and crop rotation remained largely unchanged. Of about 800,000 farms, more than 90 % cultivate under one hectare and only about 2,000 enterprises own modern plants (MAKOSZ, 2003). Strawberries were produced on about 195,000 farms, Currants on 80,000, and raspberries on about 50,000 (MAKOSZ, 2004). Many of these small-sized farms cultivate the berries for their own use, with occasional sales. The border between self-sufficiency and market production is very low. Additionally, the share of medium-sized enterprises with on-site cold-storage is becoming larger (ELLINGER, 2003a). Besides the cultivation of apples and sour cherries, the cultivation of berries plays, with a share of about 40 % of the entire fruit cultivated area, an important part. In particular, the cultivation of strawberries (with 40-50 %) black currants (30-40 %) and raspberries (approx. 15 %) dominate the cultivation of berries. About 60 % of fruit production goes into processing and 20-30 % of the total production is sold to supermarkets or directly to retail shops. Up to 10 % of the berries are bought directly by consumers on the farm, and street-trading is of great importance (BWA, 2002). Polish analysts expect exports of fresh products to increase further in the next 3-5 years as Polish farmers increase production of table varieties.

The structure of fruit cultivating farms crucially affects marketing. Large-sized farms sell their berries directly to the processing industry; small-sized farms deliver their berries to a collecting point. Usually, in each larger region cultivating berries a collecting point exists to which the fruits are delivered once a day during harvest. The collecting points are organized either by traders or freezing companies. Afterwards the fresh berries will be frozen and stored in cold-storage depots and sold to the processing industry during the year. Delivery to the collecting point usually takes place without previous arrangements.

Table 2: Structure of berry production in Poland¹⁾

| | | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|----------|------|------|------|------|------|------|------|------|------|------|------|
| Strawberries | | | | | | | | | | | | |
| Acreage | 1,000 ha | 61 | 41 | 61 | 54 | 50 | 53 | 58 | 62 | 66 | 38 | 35 |
| Yield | t/ha | 3,3 | 3,1 | 3,5 | 3,4 | 3,1 | 2,9 | 3,1 | 2,8 | 3,7 | 4,0 | 3,3 |
| Producer price: Processing | Zl/Kg | 1,01 | 2,44 | 0,91 | 1,11 | 1,81 | 3,15 | 2,02 | 1,44 | 0,96 | 2,02 | 3,80 |
| Producer price: Fresh market ² | Zl/Kg | n.a. | n.a. | n.a. | n.a. | 2,00 | 3,50 | 2,30 | 1,80 | 3,00 | 2,50 | 3,50 |
| Production | 1,000 t | 200 | 142 | 211 | 181 | 163 | 150 | 178 | 171 | 242 | 153 | 115 |
| Export | 1,000 t | 106 | 96 | 95 | 136 | 122 | 99 | 84 | 105 | 148 | 144 | 95 |
| fresh | 1,000 t | 17 | 14 | 21 | 22 | 15 | 15 | 12 | 11 | 21 | 17 | 14 |
| frozen | 1,000 t | 89 | 82 | 73 | 114 | 107 | 84 | 72 | 93 | 127 | 127 | 81 |
| Export content | % | 53 | 68 | 45 | 75 | 75 | 66 | 47 | 61 | 61 | 94 | 82 |
| Raspberries | | | | | | | | | | | | |
| Acreage | 1,000 ha | 10 | 10 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 15 |
| Yield | t/ha | 3,3 | 2,9 | 3,3 | 2,9 | 3,2 | 3,5 | 3,4 | 3,4 | 3,5 | 3,3 | 2,7 |
| Producer price: Processing | Zl/Kg | 1,68 | 3,66 | 3,45 | 1,32 | 1,21 | 2,60 | 1,80 | 2,50 | 2,00 | 2,80 | 2,9 |
| Producer price: Fresh market | Zl/Kg | n.a. | n.a. | n.a. | n.a. | 1,80 | 2,80 | 2,50 | 3,20 | 3,00 | 3,20 | 3,4 |
| Production | 1,000 t | 32 | 30 | 40 | 36 | 40 | 45 | 43 | 40 | 45 | 45 | 43 |
| Export | 1,000 t | 32 | 26 | 28 | 34 | 34 | 32 | 34 | 39 | 29 | 30 | 42 |
| fresh | 1,000 t | 17 | 14 | 16 | 20 | 21 | 20 | 13 | 18 | 17 | 17 | 23 |
| frozen | 1,000 t | 15 | 12 | 12 | 15 | 13 | 12 | 21 | 20 | 12 | 13 | 19 |
| Export content | % | 100 | 87 | 71 | 95 | 83 | 71 | 80 | 98 | 64 | 66 | 97 |
| Black Currents | | | | | | | | | | | | |
| Acreage | 1,000 ha | n.a. | n.a. | n.a. | n.a. | n.a. | 30 | 23 | 23 | 25 | 30 | n.a. |
| Yield | t/ha | n.a. | n.a. | n.a. | n.a. | n.a. | 4,3 | 4,5 | 4,4 | 5,1 | 3,7 | n.a. |
| Producer price: Processing | Zl/Kg | 0,17 | 0,41 | 1,00 | 0,85 | 0,80 | 2,90 | 3,50 | 3,80 | 2,00 | 1,60 | n.a. |
| Production | 1,000 t | 122 | 100 | 75 | 115 | 82 | 108 | 96 | 93 | 110 | 90 | n.a. |
| Export | 1,000 t | 29 | 31 | 30 | 44 | 47 | 54 | 45 | 59 | 76 | 52 | n.a. |
| fresh | 1,000 t | 8 | 7 | 10 | 15 | 11 | 11 | 14 | 21 | 20 | 13 | n.a. |
| frozen | 1,000 t | 21 | 25 | 20 | 21 | 27 | 19 | 23 | 19 | 20 | 17 | n.a. |
| concentrate ³ | 1,000 t | n.a. | n.a. | n.a. | 9 | 10 | 23 | 9 | 19 | 36 | 23 | n.a. |
| Export content | % | 24 | 31 | 40 | 39 | 58 | 50 | 47 | 63 | 69 | 58 | n.a. |

Source: GUS; IERiGZ and own calculations.

Notes: ¹⁾ Prices are in Zlotys: 2003 – 100 EUR = 439.78 Zlotys;

²⁾ In 2 Kg basket, weighted averaged price; ³⁾ Converted in fresh berries: 1 Kg concentrate = 6.5 Kg fresh black currants.

- Strawberries: The cultivation of strawberries shows strong fluctuations (Table 2). The cultivated area changed markedly, often within a short time, between 40,000 and 65,000 ha, with strong yield fluctuations. Profitability varies sharply from year to year. The degree of cost coverage varies from 40 % to 170 % (ELLINGER, 2003a). Interviews and surveys of industry experts and food technologists revealed that strawberries have special requirements for processing in terms of colour, texture, aroma and flavour. According to the findings, the ideal and almost exclusively-used variety is ‘senga sengana’. This variety is characterized by low yields, small fruits and a low resistance to diseases. The average yield of 3-4 t/ha is very low in comparison to German yields (10t/ha). As ‘senga sengana’ is replaced on the market by new, more productive varieties, its share of the entire acreage of strawberries has fallen in the last 5 years from 80 to about 60 %. There has been increased interest in the cultivation of fresh market varieties like ‘Elsanta’. Polish farmers

are aware that fresh table varieties attract higher prices and could increase the profitability of their operations (SWIETLIK, 2004).

- **Raspberries:** The cultivation of raspberries has stabilized in the recent years. In the high-price years of 1994 and 1995, cultivation expanded by around 30 %. However, in the following years, low prices provided consistent acreage of about 13,000 ha. Nevertheless, production costs of about 2.70 Zl/Kg are not obtained each year. About 80 % of the berries go to processing, both fresh and frozen. Although productivity has obviously increased, it is still rather low, with 3.5 t/ha compared with other countries. Serbia, as Germany's largest supplier, has yields of 6-8 t/ha.
- **Black Currants:** The cultivation of black currants exhibits, like the other berries, strong fluctuations, particularly relating to price (Table 2). Thus, the producer's price totalled, in 1993, only 0.17 Zl/Kg, while in 2000 it increased to a maximum value of 3.80 Zl/Kg. After overproduction in the first half of the 1990s, many trees were rooted, which brought a strong price increase beginning in 1998. Since then, the Polish average has again greatly expanded. Marketing is conducted almost exclusively by the industry (about 90 %).

4 GENERAL SPECIFICATION OF APPROPRIATE INSTITUTIONAL AND ORGANISATIONAL ARRANGEMENTS

Prior to 1990, many western European firms already had either permanent or seasonal representation on the Polish market. The reasons were the previously complicated import regulations for berries: Different import tariff quotas for different countries, different periods, different varieties, different qualities (whole, whole & broken, broken) and various conditions or aggregates of the fruits (fresh, preserved, individual quick frozen (IQF) or frozen to blocks, etc. (BEHR and ELLINGER, 1994). Many companies purchased fresh products locally from traders, contracted with Polish freezers for fruit-processing and then transported frozen berries to the destination markets (FIGURSKA, 2003). According to trade sources, Poland's accession to the EU had no major effects on the berry trade or industry (ELLINGER, 2003b). Besides this kind of procurement, even more German processing companies prefer the supply of raw materials directly from producers or producer associations (SCHMIDT and MAACK, 2001). One prerequisite for direct procurement is the offer of a sufficient amount of berries, which only large farms or associations are able to deliver.

The reason for the relatively weak development of Polish producer organisations in comparison with overall EU development are more the different conditions of farming in Poland than a permanent unwillingness to co-operate (SAEPR, 2000;

CHLOUPKOVA, 2002). This will be witnessed through the establishment of new forms of co-operations, which have a much more homogeneous membership, often composed of viable farmers of more or less similar scale, age and degree of specialization. Their internal solidarity is relatively strong. Attempts are being made to organize Polish growers into associations (as required by the EU) in order to obtain financial assistance, but have not been very successful (MAKOSZ, 2004). Until now, only a few associations applied for producer organisations of the common market organisation in fruit and vegetables (CMO). The financial situation of most cooperatives is rather poor. Because of the limited profitability of the agricultural sector, capital for modernization and investment is lacking (VAN BEKKUM and SCHILTHUIS, 1999). Due to the difficult financial situation of most Polish farms and the accompanying low use of inputs, a strong reduction of yield fluctuations or an increase in productivity are not expected in the foreseeable future (MAKOSZ, 2004).

The cultivation of berries for the processing industry is marked by special characteristics compared with other crops in Poland. Acreage and prices are subject to very large fluctuations. Thus, the cultivation of strawberries was reduced by 40 % in 2002 compared with the previous year. This development was due to very low prices, which only covered about 40 % of the costs. In the two following years, the producer price nearly quadrupled, even higher than the producer price on the Polish fresh market (SWIETLIK, 2004). This shows that the Polish producers' reactions are very price-sensitive. In addition, the large yield fluctuations are a considerable problem. The reasons are connected to small-sized farms, which usually propagate their own plants and use very low plant protection.

Contractual co-operation represents a possibility of reducing these fluctuations. The main problem is in defining well-balanced rights and duties by a contract in order to prevent moral hazards and the hold-up problem. These situations can particularly appear with production of black currants and strawberries. In future, the varieties demanded by the industry will be marketed less on the fresh market. By those increasingly specific investments, the number of potential transaction partners will decrease, and the market will enter a small numbers condition. This small numbers condition will be enhanced by the market structure of the fruit processing industry, with few customers holding a relatively large market share and facing the reduced transportability of the berries. The processors might exploit the buyer's power, knowing that growers have very little alternative in the short-term, and even in the long run. Due to the characteristics of berry cultivation, the farmers are locked into these relationships: High funding needs relative to other arable crops, a high strain on liquidity in the unproductive years before the first yield, long operating life and duration of capital tie-up and a long pay-off period all make it tough to recover employed capital. One innovative and promising element of contracts is capital-sharing between growers and

processors. This provision introduces an additional institution or rule to foster the mutual interest of the two contracting parties.

There is currently one promising example near Warsaw which may and should serve as a model: In the late 1990s, one company and one association of 150 farmers set up a contractual agreement defining price, quantity and quality provisions. This co-operation was initiated in 1998 by a German fruit processing enterprise. The contractual agreements for the cultivation of the strawberry variety 'senga sengana' were firmly agreed upon for the entire 4-year contract period. The average yield increased by over 10t/ha through support of the industry with credit intake, the common use of machines and cultivation consultation. This example shows very obviously that a contractual agreement can considerably increase productivity and that such a co-operation can be profitable for both sides.

5 DISCUSSION AND CONCLUSION

The cultivation of berries in Poland is characterized by strong fluctuations in yield, acreage and prices which affect procurement costs for the industry. Vertical contractual agreements can reduce these fluctuations substantially. The industry is not succeeding in transferring the varying raw material costs on the retail level; the share of costs for berries is high; imports depend on only a few supplier countries; and the increasing requirements of food security and traceability all increase the industry's interest in securing at least a part of the berries contractually. The important motives for co-operation are the sufficient and safe purchase of raw materials, constant prices and a more reliable basis for calculation. A special advantage of cultivation under contract is that improvements in quality production, quality control and quality security, through the exertion of influence on cultivation, can be achieved.

Within the context of the study, the farmers interviewed have, in principle, a positive attitude regarding vertical co-operation with the processing industry. The central motive was not only the achievement of higher prices, but the savings of sales and thus a reliable basis for calculation. One prerequisite for successful, ongoing co-operation is the well-balanced distribution of risks and risk premiums between the farmer and processor. This is necessary because berry production is characterised by a high initial investment, an unproductive first year (or years) of cultivation and a long pay-off period. By the increasingly specific investments of producers, the number of potential transaction partners will decrease and a small numbers condition will emerge. This condition will be enhanced by the market structure of the fruit processing industry, with few customers possessing a relatively large market share. This will lead to unilateral dependence and a lack of market transparency, connected with the unequal distribution of market power. One innovative and promising element of co-operation is capital-sharing

between growers and processors, which has been included in the aforementioned contract. Despite the many substantial and yet unsolved problems, the few existing contracts between processors and growers in Poland show that the contracting parties are able to negotiate contracts with a well-balanced distribution of risks and risk premiums. Generally, while existing contracts in Poland may not cope with all problems involved in the supply-demand relations of the parties, they may serve as models for additional agreements.

REFERENCES

- BEHR, C., ELLINGER, W. (1994): Schutzmaßnahmen der EG bei der Einfuhr von gefrorenen Erdbeeren aus Polen, unpublished rep., ZMP, Bonn.
- BUNDESMINISTERIUM FÜR WIRTSCHAFT UND ARBEIT (BWA) (2002): Export manual Polen: Der Weg der österreichischen Lebensmittelwirtschaft in die Regale Polens, Wien.
- BUNDESVERBAND DER OBST-, GEMÜSE- UND KARTOFFELVERARBEITENDEN INDUSTRIE (BOGK) (2002): Geschäftsbericht 2002/2003, Bonn.
- CHLOUPKOVA, J. (2002): Polish agriculture: Organisational structure and impacts of transition, *Economics Working Papers 2002/3 of the Royal Veterinary and Agricultural University*, Copenhagen.
- MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT (2003): Polish agriculture, rural areas and food processing before accession, in: VAN BERKUM, S., DE BONT, K. (eds.): Policies for Agriculture in Poland and the Netherlands – Contributions to a Policy Dialogue, The Hague.
- ELLINGER, W. (2003a): Die EU-Osterweiterung: Auswirkungen auf den Beerenobstmarkt, Teil 1, *Monatsschrift*, Vol. 91, Issue 6, pp. 344-345.
- ELLINGER, W. (2003b): Die EU-Osterweiterung: Auswirkungen auf den Beerenobstmarkt, Teil 2, *Monatsschrift*, Vol. 91, Issue 7, pp. 400-401.
- FIGURSKA, J. (2003): Poland strawberries annual 2003, in: UNITED STATES DEPARTMENT OF AGRICULTURE (ed.): GAIN Report, Warsaw.
- FISCHER, M. (1993): Distributionsentscheidungen aus transaktionskostentheoretischer Sicht, *Zeitschrift für Betriebswirtschaft*, Issue 4, pp. 247-257.
- GALIZZI, G., VENTURINI, L. (1999): Towards a theory of successful vertical cooperation in the food system, in: GALIZZI, G., VENTURINI, L. (eds.): Vertical Relationships and Coordination in the Food system, Heidelberg, pp. 61-92.
- GUS: Rocznik Statystyczny, var. vol., Warsaw.
- HARTMANN, H. (1994): Beschaffungsmarkt Osteuropa – Die Preisgestaltung allein darf nicht entscheidend sein, *Beschaffung aktuell*, Issue 4, pp. 43-47.
- INSTYTUT EKONOMIKI ROLNICTWA I GOSPODARKI ZYWNOSCIOWEJ (IERIGZ): Rynek owocow i warzyw, var. vol., Warsaw.
- KOWALAK, T. (1993): Poland – Co-operatives in Eastern & Central Europe, INTERNATIONAL CO-OPERATIVE ALLIANCE (ed.): *ICA Studies & Reports*, Geneva.

- MAKOSZ, E. (2003): Blüht jetzt im Osten der Obstbau auf?, *innofrutta, Vol. 1, Issue 1*, pp. 4-7.
- MAKOSZ, E. (2004): Der polnische Obstbau aus betriebswirtschaftlicher Sicht, Lublin.
- SCHMIDT, E., MAACK, K. (2001): Chancen und Probleme der Versorgung deutscher obstverarbeitenden Unternehmen mit Beerenobst aus heimischer Erzeugung, *Schriftenreihe des BMVEL, Angewandte Wissenschaft, Issue 489*, Münster-Hiltrup.
- SCHWIERZ, A. (2000): Stand und Entwicklung der Obst- und Gemüseverarbeitung in Mittel- und Osteuropa, *Obst,- Gemüse und Kartoffelverarbeitung, Vol. 85, Issue 3*, pp. 116-121.
- SEKJA ANALIZ EKONOMICZNYCH POLITYKI ROLNEJ (SAEPR) (2000): Stereotypes in the European Union concerning Polish agriculture, Warsaw.
- SWIETLIK, J. (2004): Szanse zbytu owocow truskawek w kraju i na eksport po wejsciui Polski do UE, unpublished report, Instytut Ekonomiki Rolnictwa i Gospodarki Zywnosciowej, Warsaw.
- VAN BEKKUM, O.-F., SCHILTHUIS, G. (1999): Agricultural cooperatives in Central Europe: Structural reform in preparation for EU accession, paper presented at the ICA Conference: "Continuity, Transition and Renewal: New Trends in European Cooperation", Weimar, 15.-17.10.1999.
- WERNER, E. (2000): Marktstruktur und -entwicklung des deutschen Konfitüremarktes: Beschreibung, Analyse, Determinanten des Konsumentenverhaltens, Giessen.

SUPPLY CHAIN NETWORKS: ANALYSIS BASED ON STRATEGIC MANAGEMENT THEORIES AND INSTITUTIONAL ECONOMICS

JON H. HANF¹

ABSTRACT

Traditionally, most agricultural goods were considered to be commodities. For this reason, suppliers could be easily substituted. Therefore, to create counter-vailing power, horizontal co-operations have been functioning in agribusiness for more than 100 years. Whereas co-operatives have historically been the predominant form of co-operation, today networks are being formed.

The questions of how such chain networks should be designed and which governance structure best fits have been addressed in several well-known articles. However, questions dealing with chain strategy and management have not been discussed satisfyingly. Thus, the paper will address these questions by using strategic management theories and concepts, as well as institutional economics.

Keywords: Agri-Food Business, networks, chain management.

1 INTRODUCTION

Since the beginning of food processing, the product flow has not been changed substantially. However, this is certainly not true for the food products themselves. Instead of being merely an inspection and experience good, today food is perceived as a complex bundle of inspection, experience, and credence characteristics. This development has been brought about by various circumstances.

Though there have been many influencing factors, for this paper the consequences resulting from the crisis of the winter of 2000/01 are of major importance. After Bovine Spongiform Encephalopathy (BSE) and Foot and Mouth Disease (FMD) hit Germany, transparency of the whole production process was

¹ Institut für Agrarentwicklung in Mittel- und Osteuropa, Theodor-Lieser-Str. 2, 06120 Halle (Saale), Germany, Tel: 0049-(0)345-2928246, Email: hanf@iamo.de.

demanded by consumers and politicians. As a result, quality was newly defined by 1) customer needs, 2) the product's "fitness of use", and 3) the orientation of the whole chain's process. The first consequence of this redefinition was that animal feed had to be treated with the same precautions as food products. Furthermore, the demands that the production of organic food should be increased and animal welfare extended can be regarded as effects of the crisis. The EU directive "178/2002" on traceability can be seen as the most recent repercussion. Additionally, the contemporary discussion of labelling of GMOs adds to the complexity of modern food products.

The requirements of food products have led to the demand of a transparent production chain, which in turn has led to a demand for information availability, thus making information a competitive must. Nevertheless, in order to gain a competitive advantage, this information requirement must be transformed into knowledge, creating an inimitable and non-substitutable asset. In consideration of these aspects, the food chain is in the process of being re-designed into vertically co-ordinated organisations. Hence, the nature of competition in the agri-food business is being altered from traditional (spot) market exchange to the competition of vertically co-ordinated food chains. Such chain systems can have various forms of co-operation or even be vertically integrated firms. However, several studies have shown that the majority of vertical chain organisations are co-operations of a number of firms. Co-operations that contain various firms and are sequentially connected can be called Supply Chain Networks.

The questions of how such chain networks must be designed and which governance structure best fits have been addressed in several well-known articles (GULATI et al., 2000; HENDRIKSE, 2003; OMTA et al., 2001; LAZZARINI et al., 2001). The aim of this paper is not to improve the discussion of the government of chain networks. Instead, enhancing the discussion on the co-ordination of vertical networks, i.e., chain management, is the goal.

First, the German agri-food business and the changes of food quality will be outlined. Thereafter, the concept of networks and Supply Chain Networks will be introduced, including elaboration on the questions of a chain management. Finally, conclusions will be drawn.

2 AGRI-FOOD BUSINESS AND FOOD QUALITY

2.1 Agri-food business

The agri-food business is characterised as an entity comprised of participants involved in the production and distribution of food products. Additionally, every task of securing food safety is an important matter. Widely defined, banks, insurance companies, and other services are linked to the food chain. The German food retail sector is mainly in the hands of a small number of big players.

In 1998, the CR5 accounted for more than 60 % (OLBRICH, 2001) and in 2002 the CR5 still made up 63.3 % (LEBENSMITTELZEITUNG, 2003). This constant market share, which is also true for the development of the CR10 (stable at about 85 %) (LEBENSMITTELZEITUNG, 2003) indicates that the consolidation process has reached its peak. Taking a more differentiated look at the top five, two retailers are fast growing discount chains (Aldi and Lidl) two are co-operatives (Edeka and Rewe) and only the market leader (Metro group) is an investor-owned firm. Even though the co-operatives are counted as a single group, they consist, among other business formats, of self-employed retailers, whereas the processor sector is more heterogeneous. Besides some multinationals such as Nestle and Unilever Bestfoods, several big national players like Nordmilch and Haribo are active on the market. However, the majority of processors consists of small and medium-sized companies. Some branches are still dominated by co-operatives; for example the dairy business. The food handicraft businesses are especially small, family-run enterprises consisting of more than 41,000 firms (GÜNTERBERG and WOLTER, 2002). However, the number of craftsmen running multiple stores is increasing. The wholesale business is dominated by numerous co-operatives and some privately owned family businesses, whereas the agronomist sector consists of small, family run and, often, low profit farms. Overall, there are more than 500,000 farms in Germany, about half of which are run by full time farmers. Farm suppliers are again rather heterogeneous. This branch is composed of multinationals, large national enterprises and medium-sized companies. (HANF and KÜHL, 2002)

2.2 Food quality

Traditionally, commodities were produced by farmers and afterwards transferred into food products, with the emphasis being on the quantity produced. Today, the food chain is more complex. This increase of complexity can be particularly observed in the context of food scares. After BSE and FMD hit Germany in the winter of 2000/01, transparency of the whole production process was demanded by consumers and politicians, with the result being that the food chain is in the process of being re-designed.

The key driver for the re-design of the food chain is the reliable transfer of trust attributes regarding product quality to the consumer. The distinction between various product attributes, first introduced by NELSON (1970) and the introduction of trust attributes in the economic literature by DARBY and KARNI (1973) changed the perception of food products. It became apparent that these attributes altered food products from rather uncomplicated raw commodities to somewhat more complex goods. Since the beginning of the 1990s, these findings have been used extensively in the literature on agricultural economics. Since the mid-1990s, works on trust attributes have become more popular and have been frequently used in publications (ANDERSEN, 1994). Trust attributes are characterised as product and service characteristics which cannot be detected under ordinary

circumstances by the buyer, neither before nor after the buying process has finished. For experience goods, the verification of the attributes' correctness can be exercised immediately after the purchase. For search goods the buyer is able to find evidence of the attributes even prior to the purchase (HANF, 2000; PICOT et al., 2001).

The above-mentioned food quality crises (BSE, etc.) caused food products to be perceived as shopping, experience and trust attributes by consumers. Knowing their inability to prove the correctness of trust attributes themselves, people reacted in the case of food crises with a sharp reduction of food demand (BÖCKER and HANF, 2000). For food products, trust attributes can be divided into: Meta-physical/credence attributes like "organic", "animal welfare" and "produced in a special region", chain transparency and traceability, or risk-related trust attributes like "salmonella-free" and "free of cholesterol" (HANF, 2000).

While metaphysical trust attributes are generally affiliated with the production process, risk related attributes are generally part of the product itself. Bounded rationality, asymmetric information and time restraints are factors that create a situation in which consumers are not able or willing to prove the quality of food products. Most of the trust attributes are considered to be components of quality by the consumers. With the increased sophistication of control and measurement technologies, credence attributes alter to experience attributes (HANF and DRESCHER, 1994). However, on the other hand, there are always new credence attributes evolving. In particular are credence characteristics which are related to ethical and emotional topics such as animal welfare, etc. (HANF and KÜHL, 2003). Demonstrating that quality is a multi-attributed construct, this perspective will have some interesting implications for the understanding of construct quality, which can be divided into at least three dimensions:

- Customer orientation, i.e., quality attributes must be recognised by the customer);
- Process orientation, i.e., the whole production process must be included, e.g. from farm to fork;
- The fitness of use of the product (GARVIN, 1987).

Bearing these dimensions of quality in mind, a dynamic change in the perception of quality by the consumer can be ascertained. A few years ago, the majority of German consumers attached little or no value to the information of traceability throughout the whole chain. Nowadays, it is a competitive necessity for every meat producer to deliver a record of traceability and transparency.

This chapter has demonstrated the complexity of the agri-food business. Being confronted with saturated markets, the participants of the food chain have adopted a more customer-orientated approach. This means that the firms must react to the wishes, demands and needs of their customers. Especially after the BSE and FMD

scares, people demand trust as a major dimension of quality. Consequently, the biggest challenge for participants in agri-food business is to signal trust worthiness.

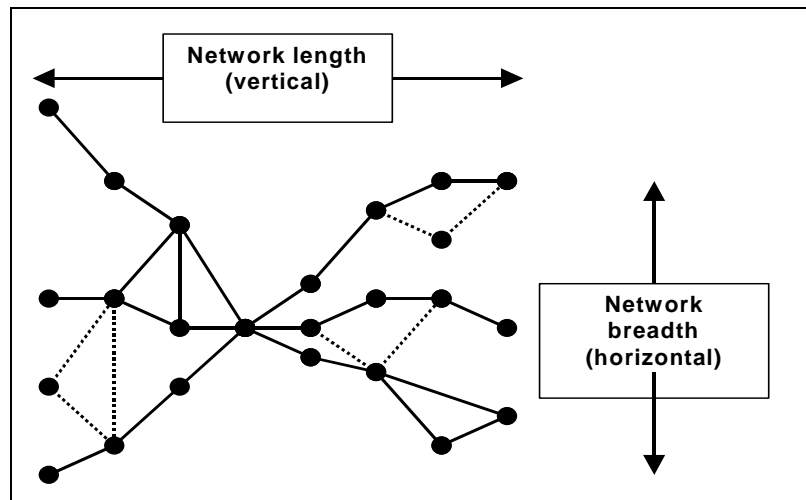
3 SUPPLY CHAIN NETWORKS

3.1 Networks

Traditionally, economics has discussed two forms of business transactions. One was through (spot) market transactions and the other was by vertical integration. Institutional economics introduced different approaches in the form of hybrid organisational concepts. Hybrid forms are the systematic optimisation of activities through inter-firm co-ordination and co-operation. In general, market transactions are perceived as being unable to pool capabilities and resources of different economic actors, while with vertical integration, flexibility and market incentives are lost (ILIOPOULOS, 2003). In the following chapters I will concentrate on one specific form of hybrid – the network approach. Thus, in 3.1, I will introduce networks and explain their rationality in general, while in 3.2 I will elaborate on a special type of network – Supply Chain Networks.

Network is a term widely spread throughout sociology and management sciences. This term covers all arrangements defining recurrent contractual ties among autonomous entities (MENARD, 2002). Generally, networks can be defined as "specific properties of the transaction relationships, typified by relational relationships in which formal and informal sharing and trust building mechanisms are crucial," (ZYLBERSZTJN and FARINA, 2003). As Fig. 1 shows, networks do not particularly address vertically organised ties. Rather, they more generally address all questions on inter-organisational relationships of more than two firms (LAZZARINI et al., 2001).

In network science, collaboration is determined by different forces e.g. complementary abilities of the involved firms and risk reduction (MENARD, 2002). However, the rent of collaboration is not only risk reduction. Instead, by combining complementary abilities, higher efficiency and performance can be gained. This viewpoint is attached to the resource-based view of a firm, i.e., the success of an enterprise is determined by its ability to focus on its own strength and competencies. These strategic resources are heterogeneously distributed across firms and differ among each firm, leading to the question about the core competencies, which are a central concept of the resource-based view of the firm (BARNEY, 1991). Core competencies are defined "as the collective learning in the organisation, especially how to co-ordinate divers production skills and integrate multiple streams of technologies," (PRAHALAD and HAMEL, 1990).

Figure 1: Network (OMTA et al., 2001)

While the resource-based view of the firm (RBV) traditionally focused on the intra-firm creation of core competencies as a competitive advantage (BARNEY, 1991; PRAHALAD and HAMEL, 1990) GULATI et al., (2000) amplified the RBV in such a way that networks can be seen as an origin of inimitable resources creating inimitable, and non-substitutable value. As inputs into the networks, production process resources became an important issue since they have the potential for achieving superior organisational performance (BARNEY, 1991). Mainly, rare, valuable, inimitable and non-substitutable resources are important for providing sustainable competitive advantage: These resources can be separated into property-based and knowledge-based. Property-based resources are traditional, tangible input factors, while knowledge-based resources are bundles of intangible factors (MILLER and SHAMSIES, 1996). As inimitability and non-substitutability are required, intangible resources particularly gain in importance. Besides image and culture, knowledge was identified as a major production factor and an intangible resource for organisations, thus enabling employees and organisations to combine and transform tangible resources for unique production processes and products (STEWART, 1997). Through comparison of a multiunit organisation with a network, TSAI (2000) showed that units rich in social capital and strategic relatedness are more likely to realise potential synergies in related business operations. Organisations are more capable of ascertaining and utilising new opportunities and reacting accurately to potential changes, as well as strategic and tactical actions, in both the internal and external environment (WIKLUND and SHEPHERD, 2003). The transfer and creation of explicit and implicit knowledge within the network through co-operation especially permits the network to be more competitive. Mainly organisational knowledge gains importance, as it has the ability to serve as a source of sustainable differentiation, and as it inherently promises difficulties to imitate. By formal and informal knowledge, e.g. routines, contractual

rules can be substituted by lowering transaction cost and information asymmetries. In an environment in which the survival of organisations depends on the ability to be innovative (HAYEK, 1949) the firm's success is determined by its dynamic capabilities, i.e., the ability to integrate, build and reconfigure internal and external resources and competencies (TEECE et al., 1997). Particularly for product innovations, the co-ordination of knowledge between the different ties of a network chain might enhance the chance of creating a successful new product. Within networks, firms are embedded in upstream and downstream flows of resources, information, and knowledge. Hence, networks can influence the nature of competition and the profitability beyond traditional measures of industrial competition (GULATI et al., 2000).

By focusing on core competencies, a single company, on the one hand, is able to capture the returns of applying economies of learning, scale and scope. On the other hand, this firm faces the high risk of a specialised production orientation. Through collaboration, specialised firms are able to share their strengths to create a more competitive entity and simultaneously reduce a firm's individual risks, as well as to increase sales and revenues (ARBEITSKREIS, 1995). Besides such financial incentives, non-pecuniary incentives like knowledge generation, power, and trust are key concepts in the network theory of motivating economic actors to co-operate (UZZI, 1997). The role the single firm plays within the network is determined by its power, its competencies, its interests, existing rules, and the aim of the network (OMTA et al., 2001). Through mutual dependency of assets developed within networks, companies can secure the investments they have made to sustain the network (MENARD, 2002). The degree of dependency of a single firm also determines the role it plays within the network. However, even if a supplier is highly dependent on the focal company, this supplier still has some power. Similar to the resource dependency theory, the focal company cannot totally dispose of this firm (PFEFFER and SALANCIK, 1978). This implies that both parties have an interest in a true partnership, which implies that within a network, common values exist based on loyalty and trustworthiness. ALBACH (1992) used the term of a "strategic family". An example of a strategic family in the food business is the network of McDonald's, which calls itself the McDonald's family. However, there are also some constraints: Divergent aims of the actors, information asymmetries, partitioning of gains and losses, opportunistic behaviour, etc. (ARBEITSKREIS, 1995). To overcome constraints and to achieve gains, a collaboration ought to have shared values, trustworthiness, as well as shared knowledge and a shared strategy. Such efforts lead to the creation of a "unique relationship proposition", defined as an exclusive benefit perceived within a loyal and long-lasting relationship between at least two economic actors striving for a common goal by co-operation (HANF and KÜHL, 2003).

A more differentiated approach to networks is taken by BURR (1999), who classifies four typologies: Spontaneous network, self-organising network,

project-orientated network, and strategic network. This typology is derived from the intensity of a relation, its co-ordination mechanism, and the existence of a broker. Unlike BURR (1999) who has highlighted self-organising networks, I will focus on strategic networks. In such a pyramidal-hierarchic network with a broker, a strategy-leading focal company builds the core element of the network as either a manufacturer or a retailer. The focal firm is expected to manage the system in order to realize the strategic objectives. Hence, the focal firm is thereby, in general, that firm identified by consumers as being 'responsible' for the specific food item, e.g. the producer in the case of a producer brand, and the retail firm in the pyramidal-hierarchic case of a private brand. Because of long-lasting explicit or implicit contracts, the other network actors are heavily dependent on the focal company, whereas the level of dependency is higher for vertical than for horizontal ties (WILDEMANN, 1997). Even though it seems as if dependency is rather unilateral, when applying the Resource Dependency Theory a mutual dependency becomes evident. The influence of an institution matters to the degree of resource dependency it has in its relationships with other institutions (PFEFFER and SALANCIK, 1978). If the focal organisation is itself dependent on critical inputs from other organisations, these organisations have some power over the focal company (MEDCOF, 2001).

3.2 Supply Chain Networks

Having outlined the essentials of network theory, it has been shown that networks could be used for the organisation of horizontal and vertical co-operations. However, as shown, today in the agri-food business, vertical linkages are relevant in order to guarantee the consumer the correctness of credence attributes such as organically-produced. Due to this, an explicit vertical form of networks will be introduced. A supply chain network is the joint and co-operative behaviour of companies, related by vertical product and information flows in the supply chain, in order to provide a product or service to the end consumer. The objective of most Supply Chain Networks is to produce higher quality and/or greater efficiency by co-operation rather than by the full integration of the supply chain or by market transactions (HANF and KÜHL, 2002). Supply Chain Networks can also be named netchains (LAZZARINI et al., 2001; NEVES, 2003; ZYLBERSZTJN and FARINA, 2003). Within such pyramidal-hierarchic strategic networks, the focal company or chain captain is liable, with its reputation, for the correctness of each product being produced by its supply chain network (SCN). The increasing importance of reputation or brand image can be observed in retailer's efforts to create a brand for their own company. and the building of "blockbuster brands" (brands with more than 1 billion € turnover) by manufactures (HANF and HANF, 2003). The following graph presents a generic SCN, consisting of several independent firms which aim to serve the heterogeneous customer demand.

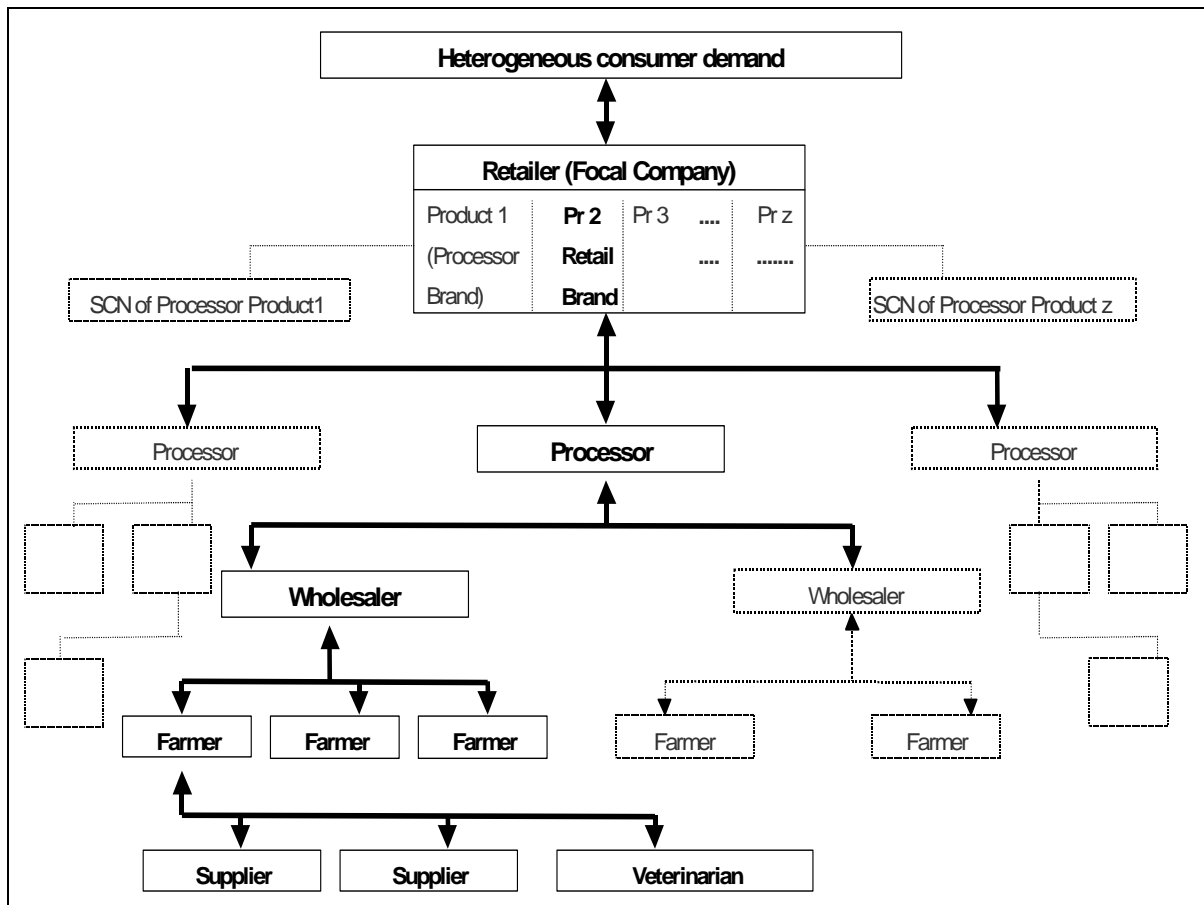
Figure 2: Supply chain network of a retailer (HANF and KÜHL, 2003)

Figure 2 demonstrates the growing complexity and organisational tasks for the focal company as more supply chains have to be coordinated (for the sake of simplicity I will explain this figure for just one retailer). The retailer's range of products consists of thousands of products. However, for the retailer's own labelled products, the retailer is considered to be the focal company responsible, e.g. for traceability and quality assurance. Since the chain captain is liable without limitation for the correctness of the production, i.e., for all credence characteristics, he must avoid any type of defect within the entire network.

Hence, the focal company has to set incentives for creating a situation in which every actor has a self interest for securing the sustainable stability of the whole network (PICOT et al., 2001). On the one hand, these incentives must be of monetary nature to create a short-term win/win situation (i.e., higher profits). On the other hand, the incentives have to be of none-pecuniary nature to create a long-lasting "unique relationship proposition", which cannot be easily imitated by competitors. These exclusive benefits could be higher profits, future joint growth, or, for some participants, merely staying in business. The co-operation in Supply Chain Networks relies on confidence and understanding. These characteristics have to be cultivated over a long time and create the space for achieving a superior joint solution of a problem (HANF and KÜHL, 2003).

Especially in the food business, where numerous small and medium-sized firms are active, co-operative networks give those firms the chance to concentrate on their core competencies. By co-operating, SME (small and medium enterprises) can better exploit their core competencies and reduce inherent risk by focussing on single activities. In the German agri-food sector, small and medium-sized enterprises (SME) play a critical role. Because of this structure, the focal company has to take into account that such companies possess neither a sophisticated IT-infrastructure nor high manpower. Additionally, single SMEs do not possess a sufficient quantity of commodities in order to supply the whole demand of the network. Especially for agricultural goods, the total amount of supply needed has to be delivered by various farmers. For this reason, horizontal co-operations have to be installed and be managed by the focal company itself or a by system supplier.

4 STRATEGIC CHAIN MANAGEMENT

4.1 The co-ordination task of the focal firm

During the last decade, consumers and politicians have revised their method of valuing food quality in the light of many food scandals. Prior to the food scandals, shopping and experience attributes almost entirely formed the basis of consumer judgment; thereafter, credence attributes became the dominant properties. Certainly the overestimation of risk properties relating to food scandals will wear off during calmer times. However, the general public's attention to these type of food properties will endure. As a consequence of these changed perceptions, as well as economic, political and public pressures, actors in the food chain have been encouraged to think about redesigning the organization of the food supply system in order to avoid similar scares in the future.

Food supply systems can be characterized as pyramidal-hierarchic strategic networks. Such networks possess a focal firm that is expected to manage the system in order to realize strategic objectives. The focal firm is thereby, in general, that firm identified by the consumers as being 'responsible' for the specific food item, e.g. the producer in the case of a producer brand and the retail firm in the pyramidal-hierarchic case of a private brand. If the focal firm is widely regarded as being responsible for the safety of the food, then the focal firm will and should establish a network management system that effectively prevents the further recurrence of food scares. This is a very difficult and comprehensive task.

4.2 Management of chains

Supply chains consist of a number of consecutive stages, and at any given stage, one or more independent firms. Material flows must be coordinated regarding timing, quantity, quality and other factors. Vertical co-operation between firms requires a great deal of co-ordination between partners and these can only be

efficiently aligned by a sophisticated management concept (BOGASCHEWSKY, 1995). ZAHRA (2003) shows that the development of operative management and of a strategic concept is crucial for the success of an organization. HANF (2004) deduces that strategic and management concepts are equally important for the frictionless functioning of chain networks. Because strategic networks are comparable to conglomerates, similar concepts can be utilized to co-ordinate an SCN (HANF and ANDREÄ, 2004). The focal company should be able to co-ordinate the information and product flows throughout the whole network – such managerial co-ordination preserves the resources of all participating firms, creating a sustainable win-win situation.

Although the managerial concepts of single enterprises can, in principle, also be used in networks, a much more detailed analysis has to be conducted in order to enlarge these managerial concepts for netchains. The management literature usually only distinguishes between the two types of strategies – corporate and business strategies. This distinction is not sufficient for adequate consideration of the multiple linkages which exist between interdependent organizations within a chain network (BRESSER and HARL, 1986). Thus, various authors have introduced the concept of collective strategies (ASTLEY, 1984; CARNEY, 1987; EDSTRÖM et al., 1984). Collective strategies are defined as systematic approaches by collaborating organizations which are jointly developed and implemented (BRESSER, 1989). Originally, collective strategies were only regarded as instruments dealing with variation in the inter-organizational environment, i.e., they aimed to stabilise and dominate the interdependent task environment (BRESSER and HARL, 1986). Collective strategies can be re-active, absorbing variation within an environment, or they can be pro-active, forestalling unpredictable behaviour by other organisations (ASTLEY and FOMBRUN, 1983).

If collective strategies are introduced in order to gain market power, they obviously violate the competition law. One reason to implement collective strategies in non-power orientated co-operations is to overcome the coordination difficulties which arise from interdependency among the firms. Interdependency is created when decisions and actions by one partner influence the decisions and actions of partnering firms (THEUVSEN, 2004). There are three types of interdependencies: i) horizontal or pooled interdependencies between firms competing in the same market, ii) vertical interdependencies between firms operating in different markets but linked by sequential work flows, where the output of one is the input of the other, and iii) symbiotic interdependencies between firms that complement each other or have reciprocal product and/or information flows (ASTLEY and FOMBRUN, 1983; LAZZARINI et al., 2001; THEUVSEN, 2004).

The focal company is the centralized decision-making unit (JARILLO, 1988) in a pyramidal-hierarchical strategic network. The focal company exerts influence on the decision which members take on tasks securing super-ordinate network aims (WILDEMANN, 1997). Furthermore, in designing its network, collective strategy

and co-ordination mechanisms, the focal company has to consider the three different types of interdependencies. LAZZARINI et al. (2001) provide advice for exerting managerial discretion for sequential (vertical) interdependencies. For pooled interdependencies they recommend the achievement of process standardization, and for reciprocal interdependencies they suggest co-ordination through mutual adjustments. For instance, when launching the "kanban" practice, Toyota formed strong direct ties with its suppliers with a norm of reciprocal obligations established through consulting assistance (DYER and NOBEOKA, 2000).

Besides employing the right approach to the interdependencies chain, management must also analyze co-operations on three different levels: The firm, dyadic and network level (DUYSTERS et al., 2004). Those authors arrived at the following findings: i) Analyses at the firm level show that successful co-operation employs a significant number of managerial constructs known from single firms. Examples are partner programs, alliance databases, joint business planning, and alliance managers. ii) Analyses at the dyadic level demonstrated that the costs of specialization are frequently higher than the costs of co-ordination, making co-operation a favourable opportunity. Because of this, the governance structure has a large impact on performance. Further, investigations at the dyadic level stress the critical role that trust and commitment play in the success of coordination. iii) Studies at the network level emphasize the role of social capital in enhancing and bringing about information exchange, which results in information advantages (UZZI and GILLESPIE, 2002). Furthermore, the capabilities, knowledge, and skills that partner firms possess are recognised as sources of competitive advantage. Consequently, network performance is related to the current ties and to ties with potential partners. iv) Altogether, DUYSTERS et al. (2004) point out that for the successful management of a network co-operation, it is essential to consider all three levels and not to merely focus on a single one.

Moreover, a further important point of chain management is the topic of partnering, which addresses issues associated with the design of relationships within a supply chain. Partnerships exhibit a certain degree of continuity and the focus of the relationships goes beyond price (MENTZER et al., 2000). Considering Supply Chain Networks and the heterogeneity of their member firms, it can be expected that along the whole chain the optimal mode of partnerships varies widely. Thus, the focal company has to work out how the partnerships should be designed. WEBSTER (1992) proposed a continuum ranging from independent partnerships to strategic partnerships. In this paper, I use the typology of MENTZER et al. (2000) which divides partnering into strategic and operational partnering. They also define strategic partnering as an "on-going, long-term, interfirm relationship for achieving strategic goals, which deliver value to customers and profitability to partners", (MENTZER et al., 2000, p. 550). The aim of strategic partnering is to improve or dramatically alter a company's competitive position through the development of new products, technologies and markets (WEBSTER, 1992).

Additionally, strategic partnering should also include exclusivity and non-imitability (MENTZER et al., 2000). Operational partnering is defined as a "needed, short-term relationship for obtaining parity with competitors" (MENTZER et al., 2000, p. 550). Thus, an operational partnering strategy seeks to improve operational efficiency and effectiveness. Such strategic orientation involves shorter time spans and less organisational resources. Therefore, operational partnership is much easier to implement, and also to reverse, than strategic partnership (MENTZER et al., 2000).

To summarise, the creation of a management system for a whole SCN is a tremendous organizational task that the focal firm has to accomplish if network advantages are to be utilized. Possible network advantages are the creation of intangible network resources, risk reduction, gaining economies of scale and scope, and the reduction of transaction costs.

- The co-ordination task must be carried out in the interest of the whole chain. The creation of a shared chain vision and the development of a collective strategy for legally-independent firms are essential presuppositions. The participating firms have to be persuaded to abandon some authority and not to behave opportunistically. Therefore, a major task for Strategic Chain Management is to create within the chain a culture of honesty and mutual trust among the members.
- Moreover, such a chain management concept turns out to be a "unique relationship proposition" attracting firms to join in. Hence, participating firms are challenged to keep up with their competitors, thus enhancing their overall efficiency. And if new enterprises join, then new knowledge, capabilities and competencies enrich the SCN and help it to prevail in an environment of co-opetition.
- Another major task of chain management is to install co-ordination mechanisms which address the three different types of interdependencies in the best way (HANF and KÜHL, 2004; HANF, 2004). Additionally, the design of a SCN has to take into account the variation of the intensity of relationships, i.e., the issue of strategic and operative partnering has to be borne in mind.

Therefore, an SCN can be called a "strategy-focused supply chain network" if it highlights a collective strategy, a strategic partnering orientation, and Strategic Chain Management. The major constraint is the complexity of a "strategy-focused SCN". KAPLAN and NORTON (2001) show that the complexity and diversity of interests within a single enterprise frequently hinders the implementation of the overall strategy throughout a single company. It is certainly much more ambitious to create a strategy for networks that are composed of a multitude of firms.

4.3 Existing chain management concepts

Since the end of the 1980s, the process as a whole was the key element of every modern management system, starting with Total Quality Management (TQM). TQM can be characterised as a customer-orientated quality management concept that concentrates on the quality of processes controlling the (end) quality of single products, i.e., instead of an "end-of-pipe orientation", a process-based orientation is taken, which leads to overall quality optimisation. In the mid 1990s the customer-orientated Supply Chain Management (SCM) and Efficient Consumer Response (ECR) were introduced. In this schema, critical and sensitive information (e.g. scanner data, amount of stocks) based on logistics, should be passed throughout the whole chain. In the late 1990s, Collaborative Planning Forecasting and Replenishment (CPFR) emerged, based on the ideas and aims of ECR and SCM. Even though these concepts consider the whole chain, the concepts themselves are mainly designed for a single company, to optimise the product and information flow between sequenced ties. Widely used in the agri-food business, TQM has evolved over time from a management system to the implementation of ISO certification. Consequently, TQM nowadays can be seen as a competitive must and not as a competitive advantage. In a literature survey of monographs on Supply Chain Management MÜLLER et al. (2003) showed that the majority of monographs made no clear distinction between SCM and logistic concepts. Specifically, the perspective of interfirm co-operation was only addressed in some exceptions. Additionally, only in the last two years have the first attempts to adjust the ideas of SME to address the majority of German agri-food enterprises been made. Therefore, SCM and ECR are still used in projects rather than in everyday business.

5 CONCLUSIONS

Horizontal co-operations have been found in the agri-food business for more than one hundred years. However, for some years, several developments – especially the change of food quality – have catalysed the establishment of vertical co-operations covering every stage of the food chain. If such vertical co-operations include a number of firms, they can be called Supply Chain Networks. SCN are characterised by having a pyramidal-hierarchic structure, a central decision-making instance (focal company), and a medium- to long-term orientation of the participating firms. Therefore, SCN can be regarded as strategic networks. Being regarded as the trustee of the food quality for the whole network, the focal company has to ensure that the network functions well. Thus, for the design of its vertical network, the focal company has to take into account that the majority of the agri-food sector consists of SMEs. In the context of the co-ordination of networks pooled, sequential and reciprocal interdependencies have to be considered.

As I have shown, the co-ordination tasks can be completed via chain management. Such a concept has to take into consideration that high amounts of information must be made available, enriched knowledge has to be created and independent companies have to be co-ordinated. Additionally, a common strategy and a common culture have to be developed. In this regard, the creation of trust among the network participants is essential. Once this challenge is mastered, the chain-management system can be used as a "unique relationship proposition" in order to attract the best firms to join the network. Attracting the best firms at all levels of the food chain is important because SCN fiercely compete against other chain organisations. As a result, competition in the agri-food business can be described as co-opetition, i.e., within the network, firms not only co-operate, but they also compete against other networks.

REFERENCES

- ALBACH, H. (1992): Strategische Allianzen, strategische Gruppen und strategische Familien, *ZfB, Issue 6*, pp. 663-670.
- ANDERSEN, E. S. (1994): The evolution of credence goods: A transaction approach to product specification and quality control, *MAPP Working paper, No. 21*, Aarhus.
- ARBEITSKREIS "DAS UNTERNEHMEN IM MARKT" (1995): Vertikale Geschäftsbeziehungen zwischen Industrie und Handel, *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung, Special issue 35*, pp. 179-204.
- ASTLEY, W. G. (1984): Towards an appreciation of collective strategy, *Academy of Management Review, Vol. 9*, pp. 526-535.
- ASTLEY, W. G., FOMBRUN, C. J. (1983): Collective strategy: Social ecology of organizational environments, *Academy of Management Review, Vol. 8*, pp. 576-587.
- BARNEY, J. (1991): Firm resources and sustained competitive advantage, *Journal of Management, 17 (1)*, pp. 99-120.
- BÖCKER, A., HANF, C.-H. (2000): Confidence lost and – partially – regained: Consumer response to food scares, *Journal of Economic Behavior & Organization, Vol. 43*, pp. 471-485.
- BOGASCHEWSKY, R. (1995): Vertikale Kooperation – Erklärungsansätze der Transaktionskostentheorie und des Beziehungsmarketings, *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung, Special issue 35*, pp. 159-178.
- BURR, B. (1999): Koordination durch Regeln in selbstorganisierenden Unternehmensnetzwerken, *Zeitschrift für Betriebswirtschaft, 69 (10)*, pp. 1159-1179.
- BRESSER, R. K. F. (1989): Kollektive Unternehmensstrategien, *Zeitschrift für Betriebswirtschaft, Vol. 59*, pp. 545-564.
- BRESSER, R. K. F., HARL, J. E. (1986): Collective strategy: Vice or virtue?, *Academy of Management Review, Vol. 11*, pp. 408-427.
- CARNEY, M. G. (1987): The strategy and structure of collective action, *Organization Studies, Vol. 8*, pp. 341-362.

- DARBI, M., KARNI, E. (1973): Free competition and the optimal amount of fraud, *Journal of Law and Economics*, Vol. 16, pp. 67-88.
- DUYSTERS, G., HEIMERIKS, K. H., JURRIENS, J. A. (2004): An integrated perspective on alliance management, *Journal on Chain and Network Science*, Vol. 4, pp. 83-94.
- DYER, J. H., NOBEOKA, K. (2000): Creating and managing a high-performance knowledge-sharing network: The Toyota Case, *Strategic Management Journal*, 21 (3), pp. 345-367.
- EDSTRÖM, A., HÖGBERG, B., NORBÄCK, L. E. (1984): Alternative explanations of interorganizational cooperation: The case of joint programmes and joint ventures in Sweden, *Organization Studies*, Vol. 5, pp. 147-168.
- GARVIN, D. A. (1987): Competing on the eight dimensions of quality, *Harvard Business Review*, Nov.-Dec., pp. 101-109.
- GÜNTERBERG, B., WOLTER, H.-J. (2002): Unternehmensgrößenstatistik 2001/2002, Institut für Mittelstandsforschung Bonn, pp. 204-208.
- GULATI, R., NOHRIA, N., ZAHEER, A. (2000): Strategic networks, *Strategic Management Journal*, 21 (3), pp. 203-216.
- HANF, C.-H. (2000): Wettbewerbsfähigkeit und Unternehmertum in der Land- und Ernährungswirtschaft, *Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e.V.*, Vol. 36, pp. 265-271.
- HANF, C.-H., DRESCHER, K. (1994): Der Einfluß von Verbraucherverhalten, Produktqualität und technischem Fortschritt auf die vertikale Koordination im Nahrungsmittelsektor, *Agrarwirtschaft*, Issue 43, pp. 423-430.
- HANF, J. H. (2004): Strategic Chain Management in the German agri-food business, SAM/IFSAM VIIth World Conference, Göteborg/Schweden, 05.-07.07.2004.
- HANF, J. H., ANDREÄ, K. (2004): As a consequence of change – Supply Chain Networks in the agri-food business, *Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues*, Vol. 40, (noch im Druck).
- HANF, J. H., KÜHL, R. (2004): Strategy focussed Supply Chain Networks, in: BREMMERS, H. J., OMTA, S. W. F., TRIENEKENS, J. H., WUBBEN, E. F. M. (eds.): Dynamics in Chain and Networks, Wageningen Academic Publishers, pp. 104-110.
- HANF, J. H., HANF, C.-H. (2003): Auswirkungen des globalen Konzentrationsprozesses im Lebensmitteleinzelhandel auf den Ernährungssektor, *Schriftenreihe der Agrar- und Ernährungswissenschaftlichen Fakultät der CAU*, Vol. 98, Kiel, pp. 235-243.
- HANF, J. H., KÜHL, R. (2003): Marketing orientation and its consequence for the food chain, in: BAOURAKIS, E. G. (ed.): Marketing Trends for Organic Food in the Advent of the 21st Century, World Scientific Publishing, London, pp. 116-135.
- HANF, J. H., KÜHL, R. (2002): Consumer values vs. economic efficiency in food chains and networks, in: TRIEKENS, J. H., OMTA, S. W. F. (eds.): Paradoxes in the food Chain and Networks, Wagening Academic Publishers, Wageningen, pp. 35-43.
- HAYEK, F. A. (1949): The meaning of competition, Individualism and economic Order, Routledge & Kegan Paul, London.
- HENDRIKSE, G. W. J. (2003): Governance of chains and networks: A research agenda, *Journal on Chain and Network Science*, 3 (1), pp. 1-6.

- ILIOPOULOS, C. (2003): Vertical integration, contracts, and the theory of the cooperative organization, paper presented at the conference "Vertical Markets and Cooperative Hierarchies", Bad Herrenalb/Germany, 12.-16.06.2003.
- KAPLAN, R. S., NORTON, D. P. (2001): The strategy focused organization, Harvard Business School Press, Mass, Boston.
- JARILLO, J. C. (1988): On strategic networks, *Strategic Management Journal*, 9 (1), pp. 31-41.
- LAZZARINI, S., CHADDAD, F., COOK, M. (2001): Integrating supply chain and network analysis: The study of netchains, *Journal on Chain and Network Science*, 1 (1), pp. 7-22.
- LEBENSMITTELZEITUNG (2003): Die marktbedeutenden Handelsunternehmen 2003, LZ Medien, Frankfurt.
- MEDCOF, J. W. (2001): Resource-based strategy and managerial power in networks of internationally dispersed technology units, *Strategic Management Journal*, 22 (11), pp. 999-1012.
- MENARD, C. (2002): The economics of hybrids organisations, Presidential Address, ISNIE, MIT, Boston, 29.09.2002.
- MENTZER, J. T., MIN, S., ZACHARIA, Z. G. (2000): The nature of interfirm partnering in supply chain management, *Journal of Retailing*, Vol. 76, pp. 549-568.
- MILLER, D., SHAMSIE, J. (1996): The resource-based view of the firm in two environments: The Hollywood film studios from 1936 to 1965, *Academy of Management Journal*, 39 (3), pp. 519-543.
- MÜLLER, M., SEURING, S., GOLDBACH, M. (2003): Supply Chain Management – Neues Konzept oder Modetrend, *Die Betriebswirtschaft*, 63 (4), pp. 419-439.
- NELSON, P. (1970): Information and Consumer Behavior, *Journal of Political Economy*, 78, pp. 311-329.
- NEVES, M. F. (2003): Marketing and network contracts (Agreements), *Journal on Chain and Network Science*, 3 (1), pp. 7-19.
- OLBRICH, R. (2001): Ursachen und Konsequenzen der Abhängigkeitsverhältnisse zwischen Markenartikelindustrie und Handel, *Marketing ZFP*, Issue 44, pp. 253-267.
- OMTA, A. W. F., TRIENEKENS, J. H., BEERS, G. (2001): Chain and network science: A research framework, *Journal on Chain and Network Science*, 1 (1), pp. 1-6.
- PFEFFER, J., SALANCIK, G. R. (1978): The external control of organizations, Harper & Row, New York.
- PICOT, A., REICHWALD, R., WIGAND, R. T. (2001): Die grenzenlose Unternehmung, 4. Aufl., Gabler Verlag, Wiesbaden, pp. 316-319.
- PRAHALAD, C. K., HAMEL, G. (1990): The core competence of the corporation, *Harvard Business Review* (May-June), pp. 79-91.
- STEWART, TH. A. (1997): Intellectual capital. The New Wealth of Organizations, Nicholas Brealey Publishing, London.
- THEUVSEN, L. (2004): Transparency in netchains as an organizational phenomenon: Exploring the role of interdependencies, *Journal on Chain and Network Science*, Vol. 4, pp. 25-138.
- TEECE, D. J., PISANO, G., SHUEN, A. (1997): Dynamic capabilities and strategic management, *Strategic Management Journal*, 18 (7), pp. 509-533.

- TSAI, W. (2000): Social capital, strategic relatedness and the formation of intraorganizational linkages, *Strategic Management Journal*, 21 (9), pp. 925-939.
- UZZI, B., GILLESPIE, J. J. (2002): Knowledge spillover in corporate financing networks: Embeddedness and the firm's debt performance, *Strategic Management Journal*, Vol. 23, pp. 595-618.
- UZZI, B. (1997): Sozial structure and competition in interfirm networks: The paradox of embeddedness, *Administrative Science Quarterly*, 42 (1), pp. 35-67.
- WICKLUND, J., SHEPARD, D. (2003): Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized Businesses, *Strategic Management Journal*, 24 (13), pp. 1307-1314.
- WEBSTER, F. E. JR. (1992): The changing role of marketing in the corporation, *Journal of Marketing*, Vol. 56, pp. 1-17.
- WILDEMANN, H. (1997): Koordination von Unternehmensnetzwerken, *Zeitschrift für Betriebswirtschaft*, 67 (4), pp. 417-439.
- ZAHRA, S. A. (2003): The practise of management: Reflections on Peter F. Drucker's landmark book, *Academy of Management Executive*, 17 (3), pp. 16-23.
- ZYLBERSZTJN, D., FARINA, E. M. M. Q. (2003): Dynamics of network governance: A contribution to the study of complex forms, paper presented at the IV International Conference on Agri-Food Chain/Networks Economics and Management, Ribeirao Preto/Brasil, October 2003.

DYNAMICS OF LABOUR MARKET PARTICIPATION: WHAT DRIVES CHINESE FARMERS INTO AND OUT OF OFF-FARM EMPLOYMENT?

*THOMAS GLAUBEN**, *THOMAS HERZFELD***, *XIAOBING WANG**

ABSTRACT

In this paper a hazard function approach is applied to study the dynamics of agricultural households' labour market participation in the context of an economy under transition. Using a household survey dataset from the Chinese Zhejiang province, which covers the second half of the 1990s, we empirically examine factors that drive farm households both to start and to interrupt off-farm employment. The results suggest that education increases the persistence of households to remain in their currently occupied regime. The same applies for wealthier households. Higher agricultural income reduces the probability of starting off-farm work, but increases the risk of returning to non-participation. Finally, households in more urbanized regions face higher mobility regarding the probability of shifting to off-farm occupation, as well as transition into non-participation.

JEL classification: C41, J60, Q12.

Keywords: Labour market participation, dynamic analysis, China, hazard model.

* Department of Food Economics and Consumption Studies, University of Kiel, Germany.

** Department of Agricultural Economics, University of Kiel, Germany, E-mail: therzfeld@agric-econ.uni-kiel.de.

1 INTRODUCTION

Undoubtedly, the adjustment of rural labour markets to economic reforms is an important indicator of the progress of transition. Without well-functioning labour markets, it will be difficult to achieve the primary mode of an efficient allocation of resources and thus to effectively enforce economical transition (DE BRAUW et al., 2002). As in other transition economies, the institutional change of agricultural policy in China at the end of the 1970s strongly increased agricultural productivity, but at the same time restricted sectoral out-migration, which resulted in high rural underemployment. With the beginning of the second half of the 1980s, labour mobility was allowed for and hence an increasing integration of farm households into rural labour markets took place (BENJAMIN and BRAND, 1997; ROZELLE et al., 1999; DE BRAUW et al., 2002). Following criticisms of the impact of the rural market program, the government introduced a set of adjustment policies starting in 1990 that aimed to further phase out the old centrally-planned agricultural system in favour of more market-oriented solutions. In addition, the government has actively supported the development of non-agricultural production, in particular by township and village enterprises, to provide employment opportunities for the perceived rural labour surplus (BOWLUS and SICULAR, 2003). Policy developments starting in 1994 aim to renew self-sufficiency policies, not only at the national level, but also at the regional level. Despite the structural reforms and a general slowing of economic growth between 1993 and 1999, non-agricultural employment has continuously grown. The agricultural sectors' importance for rural employment thus declined, from 93 % in 1978 to 64 % in 2003. In the case of the Zhejiang province, the share of the rural labour force declined even faster, from 89 % to 39 % during the same period (IFPRI, 2004; SSB).

However, while Township and Village Enterprises (TVE) provided rich possibilities for off-farm employment and enhanced economic growth of rural regions at the end of the 1980s (DE BRAUW et al., 2002), agricultural land markets remain underdeveloped and family farms operate on very small plots. Under the land market constraints, the extent to which rural households take part in labour markets is limited (BOWLUS and SICULAR, 2003). Most of the households still depend on agricultural land as the lone important income source. Even though family members partly or fully work off-farm, households tend to keep land usage rights by hiring labour or working on farm in the busy season. Under the so-called "household responsibility system", land is distributed by the size of household or labour force, ignoring the heterogeneous distribution of productivity and efficiency of labour force. Without an efficient land market, some of the family members may temporarily or permanently quit off-farm jobs to keep land usage rights. The on-going process of China's reform to a market economy offers the rare chance to empirically assess the dynamics and determinants of rural households' participation in the labour market.

There is a wide body of literature analysing agricultural households' labour market participation. Off-farm labour markets are of special importance in the transformation from an agriculturally-dominated into a modern economy. Previous research applied various approaches to labour market participation and labour market responses of agricultural households. The most commonly used methods in the literature involve the estimation of probit or logit models to assess the dichotomous decision from the aspect of seasonal fluctuations of the labour force (LOVELL and ESPERANZA, 2004), the entry, exit and re-entry of non-farm employment (GOULD and SAUPE, 1989; ZHANG et al., 2001), and the degree and determinants of migration from the agricultural sector (BARKLEY, 1990). CORSI and FINDEIS (2000) as well as WEISS (1997) use different specifications of a probit model to explain the persistence of off-farm participation. Others use multinomial logit models to evaluate the household's decision-making between alternative labour market participation regimes in Chinese agriculture (CHEN et al., 2004; GLAUBEN et al., 2004). BUCHENRIEDER et al., (2002) as well as CHAPLIN et al., (2004) apply a multinomial logit model to analyse non-farm employment in three Balkan and Central European countries, respectively.

These analyses seek to identify factors influencing a household's decision regarding labour market participation. However, the applied methodologies implicitly presuppose that the process which generated the decision-making has achieved a point of equilibrium and that the probability of finding households in each of the regimes should be unaltered even with the passage of time. Empirical evidence suggests, however, that there are frequent movements over time from one state to another state. Therefore, a number of authors use the more flexible technique of duration models. A quantity of works assess individual behaviour during unemployment spells (SUEYOSHI, 1995; ADDISON and PORTUGAL, 2003), the probability of a return to employment for older workers (CHAN and STEVENS, 2001), the influence of unemployment insurance on the duration of unemployment (LIGHT and OMORI, 2004), the probability of labour force transition in decision-making processes involving a partner (BLAU and RIPHAHN, 1999), job turnover by gender (MEITZEN, 1986; LIGHT and URETA, 1992) and, finally, model the search of employers (BURDETT and CUNNINGHAM, 1998). In the framework of transition economies, the papers by ORAZEM and VODOPIVEC (1997) as well as SORM and TERELL (2000) have to be mentioned. The first two authors use a proportional hazard model to analyse the transition from unemployment to a new job in Slovenia and compare their results with the pre- and post-transition periods. Their results suggest that better-educated persons show a higher probability of finding a new job after economic transition. The latter authors analyse the transition between three different labour market participation regimes in the Czech Republic using a discrete-time hazard model. They find that younger, less educated, single men working in the construction or trade sectors face a higher probability of becoming unemployed. On the other hand, younger, more educated, married men show a higher probability of exiting unemployment and finding a new job.

This paper aims to assess the dynamics of rural households' participation in labour markets within the background of transition to a market economy. The on-going process of China's reform to a market economy offers the rare chance of empirically assessing the dynamics and determinants of rural households' participation in the labour market. Special attention is paid to the variability of households' choice over multiple spells. Previous literature on family members' participation in the labour market was based on one or two observations, which certainly understates the mobility of a labour force on a continuous basis. In order to fill the gap, we begin with a relatively new specification to consider all households over the whole period, rather than measuring the persistence of a special household status from a certain entrance time to its exit. Additionally, the longitudinal dataset facilitates incorporating family, farm and regional characteristics as explanatory variables.

The remainder of the paper is organised as follows: In Section 2 we develop a continuous-time hazard framework to estimate the probability of a household's shift into and out of off-farm work. Whether this shift is due to a trigger event or can be accounted for by the observed characteristics of family, farm and region, or unobserved heterogeneity, respectively, is analysed. Section 3 introduces the data and provides sample statistics and Section 4 presents the empirical results. Section 5 concludes.

2 ECONOMETRIC MODEL

Before proceeding to the data, some methodological information should be presented. For a more detailed description of the methodology we refer to KALBFLEISCH and PRENTICE (2002). This study analyses the transition into and out of off-farm work. The two potential transitions between supplying off-farm labour (s) and non-participation (n) on off-farm labour markets can be represented by the following transition matrix p_{ij} , where the subscript i denotes the state of origin and j the destination:

$$(1) \quad p_{ij} = \begin{bmatrix} p_{n-n} & p_{n-s} \\ p_{s-n} & p_{s-s} \end{bmatrix} \quad (i, j = s, n)$$

Assuming the probability of transition between the states of labour market participation at time $t+1$ only depends on the current state occupied at time t , the probability of transition from state i to state j is given by $p_{ij} = F_{ij} / S_i$, $i, j = \{s, n\}$.

Here, F_{ij} is the number of households in state i at time t , who flow to state j at time $t+1$, and S_i is the original stock of households in state i at time t .

After considering the probability of the transition, we specify the duration model to estimate the determinants of a household's shift. The data of the history of a

household's participation in a labour market is used to estimate a continuous-time hazard model¹. The hazard function is represented by a popular exponential regression function: $\lambda[t; X_k(t), \beta] = \exp[\beta_0 + \beta_1 x_k(t)]$. Here, λ represents the hazard of the transmission from one state to another $i, j = (s, n) \ i \neq j$, where i represents the original status at time t_1, \dots, t_{n-1} and j denotes the shifted state at time t_n . Further, λ indicates the baseline hazard of an event, say the transmission from non-participation (n) to off-farm employment (s), which can be chosen from a parametric family under the condition that there is no heterogeneity among the individuals. In this paper we chose a Weibull form:²

$$(2) \quad \lambda(t) = \lambda \rho (\lambda t)^{\rho-1}$$

where, ρ is the ancillary shape parameter estimated from the data. If $\rho > 1$, the hazard rate function monotonously increases and decreases for $\rho < 1$. Thus, allowing for time-varying covariates in the duration model and assuming a baseline hazard with Weibull form, the log-likelihood function can be written as (KALBFLEISCH and PRENTICE, 2002, p. 198):

$$(3) \quad L = \sum_{k=1}^n \delta_k [\beta_0 + \beta_1 x_k(t_k)] - \int_0^{\infty} \sum_{l=1}^n Y_l(u) \exp[\beta_0 + \beta_1 x_l(u)] du$$

here, k and l denote the number of observed households, while Y represents the left-continuous at-risk process. X is a vector of covariates which may vary with time t and u denotes the covariate history ($0 \leq u < t$). The censor indicator δ equals one for the observed transition, and zero for right-censored observations. According to KALBFLEISCH and PRENTICE (2002), the observation is right censored if its survival time is greater than the time span of the survey. In our transition models, a household shifting from state i to j and vice versa experiences risk and all observations which remain in the same regime over the whole span of the survey should be treated as right censored. It has been noted that the original state i of the certain household is not fixed for the full duration given that the household may shift its state from one to another many times during the analysed period.

Household heterogeneity includes two aspects: One is the effect of observed covariates x^3 , which shift the hazard function upwards or downwards by multiplying

¹ As JENKINS (1995) concludes from his own work, the corresponding continuous- and discrete-time duration models provide similar results and implications.

² All models were estimated with a Weibull distribution as the baseline hazard and a Cox proportional hazard model. Following the Akaike Information Criterion, the Weibull distribution is favoured in all specifications.

³ Heterogeneity of individuals reflected by differences in characteristics (x) might change the individual hazard. That is, if $\exp[x(t), \beta_{ij}] > 1$, then the risk of the event j, i for this individual would increase, and if $\exp[x(t), \beta_{ij}] < 1$ the opposite holds. Thus, the hazard model provides insights on how risk changes with the covariates.

it with a scale factor. Unobserved heterogeneity denotes remaining differences in the distributions after controlling for covariates' effects and may lead to incorrect inferences about duration dependence and the effects of included explanatory variables (KIEFER, 1988). To control for unobserved heterogeneity, an inverse Gaussian distribution is included.

3 DATA AND DESCRIPTIVE ANALYSIS

The data sample used in the study is drawn from a fixed-point household and village survey data in Zhejiang province for the period of 1995-2000. The survey, which is the primary source of microeconomic information on the economic and social condition in rural China, was directed by the Ministry of Agriculture. In order to ensure its representativeness, a stratified random survey by villages' location and average income level was conducted in Zhejiang province, containing 10 villages. Fifty households in each village were interviewed annually. Most of the households remain in the survey for the whole period if they could be classified as rural households⁴. Once a household was dropped from the survey, a new sample household was recruited from the same village and stayed in the survey for the following year, if it was qualified. Thus, the data constitutes an unbalanced time-series and cross-section data with 2,475 observations over 6 spells, where a spell is defined as one calendar year.

In addition to recording the household's status in the labour market from 1995 onwards, the survey also reports on labour participation behaviour of the given household precisely before the survey. This facilitates the tracking of the household's mobility into and out of off-farm work during the whole survey period. Table 1 summarises the snapshot status of households which participate in off-farm labour markets, as well as those which do not, in each year. The table shows that 67 % of households participate in some off-farm occupation in 1995, and this share increases to 83 % in 2000. By pooling all observations, 23 % of households, on average, never participated in any off-farm work.

One remarkable feature of Table 1 is the high variation of the share of the two regimes, especially in the first years. Table 2 reports the absolute number of transitions and shows that they fall significantly during the last year.

⁴ Under the household registration system in China, households can be divided into rural or urban.

Table 1: Static distribution of households' labour market participation

| Year | Off-farm participation | | Non-participation | | Total |
|-------------|------------------------|-------|-------------------|-------|-------|
| | No. | % | No. | % | |
| Before 1995 | 307 | 74.51 | 105 | 25.49 | 412 |
| 1995 | 248 | 67.21 | 121 | 32.79 | 369 |
| 1996 | 286 | 79.22 | 75 | 20.78 | 361 |
| 1997 | 277 | 79.37 | 72 | 20.63 | 349 |
| 1998 | 268 | 79.06 | 71 | 20.94 | 339 |
| 1999 | 275 | 82.09 | 60 | 17.91 | 335 |
| 2000 | 257 | 82.90 | 53 | 17.10 | 310 |
| Sum | 1,918 | 77.49 | 557 | 22.51 | 2,475 |

Source: Own calculations based on Agricultural Fixed Point Survey in Zhejiang Province, 1995-2000.

Table 2: Observed transition between labour market regimes, 1995-2000

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Total |
|---------------------|------|------|------|------|------|------|-------|
| $s \rightarrow n^a$ | 78 | 44 | 48 | 44 | 37 | 17 | 268 |
| $n \rightarrow s$ | 50 | 88 | 53 | 48 | 48 | 14 | 301 |
| Total | 128 | 132 | 101 | 92 | 85 | 31 | 569 |

Source: Own calculations based on Agricultural Fixed Point Survey in Zhejiang Province, 1995-2000.

Note: Variables s and n represent off-farm participation and non-participation, respectively.

From Table 1, we have a deep impression of the varying shares of off-farm participation. What explains the households' persistence or transition between the two states? We attempt to identify whether the observed transition of the household is sensitive to household, farm and village characteristics. The survey provides detailed information on household characteristics such as labour supply, households' production activities and family composition; characteristics of the farm, as well as social and economic conditions of the village in which the households are located. Table 3 presents some descriptive statistics of the covariates, conditional on the household's status in the labour market.

Table 3: Descriptive statistics

| Variables | Regime <i>SYMBOL</i> | <i>Off-farm participation</i> (<i>s</i>) (n=1918) | | <i>Non-participation</i> (<i>n</i>) (n=557) | |
|---|-------------------------|---|-----------|---|-----------|
| | | Mean | Std. Dev. | Mean | Std. Dev. |
| <i>Household characteristics</i> | | | | | |
| Age level of the household's head (1= <30, 2=30-40, 3=40-50, 4=50-60, 5= >60) | <i>AGEHEAD</i> | 2.84 | 0.96 | 3.00 | 1.11 |
| Share of labour graduated from elementary school | <i>ELEMENTS</i> | 0.44 | 0.32 | 0.45 | 0.35 |
| Share of labour graduated from secondary school | <i>SECONDS</i> | 0.34 | 0.30 | 0.28 | 0.30 |
| Share of labour graduated from high school and above | <i>HIGHS</i> | 0.07 | 0.17 | 0.05 | 0.15 |
| Share of labour with special skills | <i>SKILLS</i> | 0.15 | 0.28 | 0.10 | 0.25 |
| Number of male labour force (persons) | <i>M-LABOUR</i> | 1.45 | 0.66 | 1.30 | 0.63 |
| Number of female labour force (persons) | <i>F-LABOUR</i> | 1.28 | 0.68 | 1.16 | 0.65 |
| Number of children and elders (persons) | <i>DEPEND- ENT</i> | 1.19 | 0.93 | 1.17 | 0.88 |
| Communist party membership (1=yes, 0=no) | <i>PMEMBER</i> | 0.13 | 0.34 | 0.17 | 0.38 |
| Net transfer per capita (yuan/person) | <i>TRANSFER</i> | -83.63 | 617.10 | -47.02 | 607.44 |
| <i>Farm characteristics</i> | | | | | |
| Household's production durable assets at 1985 constant prices per capita (thousand yuan/person) | <i>ASSETS</i> | 4.01 | 5.15 | 2.95 | 2.59 |
| Sown area per capita (mu/person) | <i>SOWN</i> | 1.32 | 1.40 | 1.63 | 3.02 |
| Income from agricultural production at 1985 constant prices per capita (thousand yuan/person) | <i>AGR-INC</i> | 0.81 | 1.36 | 1.41 | 2.59 |
| Logarithm of number of animals | <i>LIVESTOCK</i> | -3.22 | 7.08 | -2.91 | 7.25 |

Table 3: continued

| <i>Village Effects</i> | | | | | |
|---|-----------------|---------|--------|---------|--------|
| Unemployment rate (%) | <i>UNEMP</i> | 13.56 | 10.15 | 10.75 | 9.55 |
| Average income per capita (thousand yuan/person) | <i>AVINCCAP</i> | 1491.01 | 618.05 | 1381.37 | 511.03 |
| Population density (inhabi- tants per mu) | <i>POPDENS</i> | 0.91 | 0.95 | 0.87 | 0.78 |
| Terms of trade | <i>TRADE</i> | 18.08 | 110.17 | 42.19 | 308.13 |

Source: Own calculations based on Agricultural Fixed Point Survey in Zhejiang Province, 1995-2000.

Starting with the household characteristics, the age level (*AGEHEAD*) of the household's head is included as a categorical variable. The age level of the head is highest in the non-participating households. To address the profiles of the educational attainment and ability of the household's members, we construct the shares of family members that finished elementary school (*ELEMENTS*), secondary school (*SECONDS*) and high school (*HIGHS*) and/or have special skills (*SKILLS*). The family composition is further characterized by the gender of labour force (*M-LABOUR* and *F-LABOUR*) and the number of dependent persons (*DEPENDENT*) including children younger than 16 years and the elders⁵. Households choosing off-farm occupation have more male and female labourers. Party members (*PMEMBER*) show a lower inclination to participate in the off-farm sector. It is interesting to find out that the mean of net transfers (*TRANSFER*) per capita is negative in the whole sample, with even higher values for participating households.

Concerning the features of the farm, the evidence is as expected. Participating households are wealthier, as indicated by the durable production assets (*ASSETS*) per capita, but labour on a smaller farm size (*SOWN*). Higher income per capita from agricultural production (*AGR-INC*) may motivate households to restrain from off-farm participation. The descriptive analysis shows that participating households raise fewer animals (*LIVESTOCK*).

Other variables included in the analysis are used to check for village and macro-economic effects. In villages with a lower unemployment rate (*UNEMP*), households tend to restrain from off-farm work. Regarding the average village income per capita (*AVINCCAP*), the figures indicate that participating households are generally located in comparatively rich villages. The indicator of population density (*POPDENS*) is used with the assumption that the probability of finding off-farm employment is higher in more densely populated villages. To capture the competitiveness of agricultural production, the Terms of Trade (*TRADE*) are included. Non-participating households face much higher Terms of Trade.

⁵ Whether older persons are counted as labour force or not in the survey depends on both age and health. Generally, if the person is above 65 years old, he would be recorded as a dependent person.

4 EMPIRICAL RESULTS

Table 4 presents the transition probabilities of households entering off-farm occupation and exiting it. The table suggests a considerably higher probability of entering off-farm work than leaving it.

Table 4: Transition probability matrix of household's labour market participation

| Year | Destination | | <i>S</i> | <i>n</i> |
|-------|-------------|----------|---------------|---------------|
| | Origin | | | |
| 1995 | <i>s</i> | | 0.7459 | 0.2541 |
| | | <i>n</i> | 0.4762 | 0.5238 |
| 1996 | <i>s</i> | | 0.8226 | 0.1774 |
| | | <i>n</i> | 0.7273 | 0.2727 |
| 1997 | <i>s</i> | | 0.8322 | 0.1678 |
| | | <i>n</i> | 0.7067 | 0.2933 |
| 1998 | <i>s</i> | | 0.8412 | 0.1588 |
| | | <i>n</i> | 0.6667 | 0.3333 |
| 1999 | <i>s</i> | | 0.8619 | 0.1381 |
| | | <i>n</i> | 0.6761 | 0.3239 |
| 2000 | <i>s</i> | | 0.9382 | 0.0618 |
| | | <i>n</i> | 0.2333 | 0.7667 |
| Total | <i>s</i> | | 0.8603 | 0.1397 |
| | | <i>n</i> | 0.5404 | 0.4596 |

Source: Own calculations based on Agricultural Fixed Point Survey in Zhejiang Province, 1995-2000.

Note: Variables *s* and *n* represent off-farm participation and non-participation, respectively.

Households with off-farm employment show the highest probability of staying in this regime during the subsequent period. This persistence in labour market behaviour stands in the centre of the analyses by CORSI and FINDEIS (2000). They separate this persistence into one observed part, called true state dependence, and one unobserved individual heterogeneity. Our analysis concentrates on the explanation of the opposite, the high proportion of transitions which occur between periods. Of those off-farm participating households, on average, 86 % tend to stay in the same group, whereas 14 % discontinued off-farm employment. Regarding non-participating households, they face a higher probability of working off-farm than remaining in their previous state. Data for China reveals similar asymmetric behaviour between entry and exit from off-farm work as observed in

other countries (GOULD and SAUPE, 1989; WEISS, 1997). Persistence of off-farm participation is much higher than persisting in autarky. Interestingly, the persistence of non-participation increases significantly in the last survey year. Reasons for this might be declining employment opportunities in industry, general employment growth below 1 %, and an increase of employment in agriculture as reflected by national statistics (KEIDEL, 2001).

The preceding tabulations provide clear evidence that the households' participation in the labour market is characterised by frequent transitions. To explore the effects of explanatory variables and unobserved characteristics on households' transitions, we present the estimated hazard ratios of the continuous-time hazard model in Table 5. The hazard ratios, which are $\exp(\beta)$, can be explained as the change in the hazard rate associated with a unit change in the value of the corresponding covariate. That is, if the hazard rate $\exp(\beta_0 + x_r \beta_{i,j_r} + \theta \varepsilon) > 1$, then the instantaneous risk of transition from the original state i to state j would increase, while $\exp(\beta_0 + x_r \beta_{i,j_r} + \theta \varepsilon) < 1$, describes a reduced risk of the corresponding transition (CLEVES et al., 2003, pp. 159).

In the following, the obtained estimated regressions and hazard ratios are presented. Compared to other specifications, the baseline hazard of the Weibull form reaches, in all estimated specifications, the lowest value of the Akaike Information Criterion (AIC) (AKAIKE, 1974; CLEVES et al., 2003). As can be seen from Table 5, the parameters controlling for unobserved heterogeneity are statistically significant⁶ in both transitions.

⁶ An asymptotic χ^2 -test is used to determine whether unobserved heterogeneity influences the transition process. Results are reported as variable θ in Table 5.

Table 5: Estimated results of duration model

| SYMBOL | n → s | | s → n | |
|--------------------|-------------|-------------------|-------------|-------------------|
| | Hazard rate | z-Value | Hazard rate | z-Value |
| AGEHEAD | 0.84 | -1.58 | 0.93 | -0.64 |
| ELEMENTS | 0.54 | -1.60 | 0.69 | -0.92 |
| SECONDS | 0.36** | -2.26 | 0.39* | -1.94 |
| HIGHS | 0.25* | -1.85 | 0.22* | -1.94 |
| SKILLS | 0.63 | -1.08 | 0.79 | -0.50 |
| M-LABOUR | 0.88 | -0.80 | 0.85 | -0.91 |
| F-LABOUR | 1.05 | 0.29 | 0.88 | -0.72 |
| DEPENDENT | 0.88 | -1.02 | 0.83 | -1.43 |
| PMEMBER | 1.67* | 1.77 | 1.63 | 1.64 |
| TRANSFER | 1.00** | -2.42 | 1.00 | 1.33 |
| ASSET | 0.95** | -2.26 | 0.86*** | -3.83 |
| SOWN | 1.05* | 1.78 | 1.01 | 0.31 |
| AGR-INC | 0.88* | -1.78 | 1.12*** | 2.67 |
| LIVESTOCK | 1.01 | 0.40 | 1.02 | 1.21 |
| UNEMP | 1.01 | 0.85 | 1.01 | 1.13 |
| ANIPP | 1.00*** | -2.63 | 1.00*** | -4.21 |
| POPDENS | 1.78*** | 3.23 | 2.08*** | 3.61 |
| TRADE | 1.00 | 1.12 | 1.00 | 0.54 |
| ln (P) | 1.04*** | 11.02 | 0.99*** | 10.38 |
| P | 2.83 | | 2.70 | |
| 1/P | 0.35 | | 0.37 | |
| θ | 6.49 | 0.00 ⁺ | 7.21 | 0.00 ⁺ |
| χ^2 | 40.68 | | 81.03 | |
| Log likelihood | -483.15 | | -461.01 | |
| AIC | | | | |
| No. of transitions | 301 | | 268 | |

Source: Own calculations based on Agricultural Fixed Point Survey in Zhejiang Province, 1995-2000.

Notes: ***, ** and * are statistically different from zero at the 1 %, 5 % and 10 % significance level, respectively; ⁺ probability that $\theta = 0$.

Estimating the mean survival time reveals that persistence in off-farm occupation, at 4.63 years, is slightly higher than non-participation, at 4.29 years. Surprisingly, most covariates influence the hazard rate in the same direction. The only exceptions are the number of female labourers (*F-LABOUR*) and agricultural income (*AGR-INC*). The magnitude of the parameter *P* indicates that the probability of both transitions increases over time. The age of the household's head (*AGEHEAD*) is a categorical variable with 5 levels. The estimated hazard ratios of the age of household's head, which underlie all transition functions, are not statistically significant at conventional levels. For the variables regarding educational attainment of family members, the estimated results imply that education increases the stability and persistence, respectively, of a household's labour market participation choices. This contradicts findings from discrete choice models where education is one of the main determinants of the probability of

working off-farm. But our results reveal that conclusions based on cross-sectional snapshot data may differ from longitudinal data with a focus on the transition between states. Education may increase regime-specific returns to human capital in off-farm work as well as in agricultural production, which lowers the probability of leaving the state currently occupied. It is assumed that more educated persons will accumulate more and faster task-specific skills and therefore face a lower risk of dismissal. Households with a larger share of members with a secondary (*SECONDS*) or high school degree (*HIGHS*) appear to have a lower propensity of leaving their currently-occupied labour market state. The persistence of participation decision seems to be higher for more educated households. Again, it is important to recall that the majority of household members obtained only elementary education or are even illiterate. This share (*ELEMENTS*) has no significant impact on the probability of transition and is the omitted category, respectively. In view of the household's demographic structure, the magnitude and effect of labour force's gender on the transition between the states has no statistically significant impact. Whereas a higher number of female labourers (*F-LABOUR*) increases the probability of starting off-farm work, it reduces the risk of exiting off-farm occupation for non-participation. This might be explained by the characteristics of agricultural work and Zhejiang province's industrial structure⁷. Considering the influence that communist party membership (*PMEMBER*) played on labour market transition, party members show a higher probability of entering off-farm occupation. Whereas the estimated hazard rate of transfers (*TRANSFER*) is highly statistically significant, the magnitude of the coefficient implies only a very small effect on the transition into off-farm work.

Interestingly, the effect of durable production capital (*ASSETS*) works in the same direction for both transitions. Wealthier households have a lower probability of moving out of their current regime. This applies more for the transition $s \rightarrow n$ than vice versa, where an increase of about 1,000 Yuan per capita reduces the probability of exiting off-farm work by 14 %, and regarding the transition into off-farm participation, the hazard rate goes down by 5 %. Contradictory to findings from the literature, an increase of sown area per capita (*SOWN*) by one mu⁸ increases the hazard rate of entering off-farm labour ($n \rightarrow s$) by 5 %, keeping other variables constant over time. Moreover, a bigger size of sown area has no significant impact on the opposite transition. The covariate of agricultural income (*AGR-INC*) has a very strong negative effect on the probability of households' transition into off-farm work, but a highly positive effect on transition into non-participation. This is the only covariate which has a significant impact

⁷ Employment in manufacturing, as well as wholesale and retail trade in Zhejiang, is significantly above the national average: 28 % compared to 11 %, as well as 11 % in comparison to 7 %, respectively (SSB).

⁸ 1mu=0.067 hectare.

on both transitions and drives the hazard function in different directions depending on the state of origin.

Considering village income per capita (*ANIPP*), it could be seen that households located in the wealthier villages tend to show a higher persistence of current labour market participation, although the magnitude of the hazard rate implies only a negligible quantitative effect. We find a statistically significant and positive effect of the population density (*POPDENS*) on the transition probability. More urbanized villages offer more income possibilities for rural households, which increases their mobility. Estimating the model with the three groups of explanatory variables separately provides similar results, which underlines the stability of the presented results.

Assessing future development is difficult. On the one hand, the increasing educational level of rural households will lead to the higher persistence of labour market regimes. The further urbanization of villages might, on the other hand, increase the mobility between off-farm work and exclusive agricultural production. That the process of increasing off-farm participation is not reversible is shown by the effect of agricultural income. Increasing profitability of agricultural production poses a high incentive for households to interrupt off-farm work and to concentrate on agriculture while at the same time reducing the probability of leaving for off-farm employment.

5 SUMMARY

The study contributes to the on-going debate over the participation of Chinese agricultural households on rural labour markets during the 1990s. In particular, the focus of attention has been on the frequency of each possible transition from non-participation to off-farm employment and vice versa. To empirically evaluate factors such as household, farm, and regional characteristics affecting the frequency of transition between labour market states, we apply a continuous-time hazard approach to a 7-year panel survey of Chinese households.

The results of the work firstly suggest that there is a significantly higher persistence of off-farm employment than of non-participation in off-farm businesses. In other words, the probability of entering off-farm work is in any year higher than the probability of exiting labour markets. Thus, the analysis reveals similar asymmetric behaviour between entry and exit from part-time farming as observed in other countries (GOULD and SAUPE, 1989; WEISS, 1997). Interestingly, the persistence of non-participation significantly increases during the last year. The underlying causes of this could be numerous, ranging from declining employment opportunities in industry to relaxed planting requirements in 2000 and therefore more opportunities for diversifying agricultural production (KEIDEL, 2001).

Unfortunately, data for the most recent years are lacking. It could not be observed whether a stable trend towards less off-farm participation is emerging.

Regarding the impact of farm and household characteristics on the risk of changing a given employment regime, we find that education increases the persistence to remain in the currently occupied regime. Education may increase regime-specific returns to human capital in off-farm work as well as in agricultural production, which lowers the probability of leaving the state currently occupied. This might indicate that more educated persons will accumulate more and faster task-specific skills and therefore face a lower risk of dismissal. Furthermore, the probability of participating in any off-farm occupation increases with party membership and farm size, and is higher in more densely populated villages. In addition, higher assets and higher agricultural incomes reduce the inclination of starting off-farm work. The probability of exiting off-farm work to concentrate on agricultural production increases with agricultural income and a location's population density.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the financial support of the Deutsche Forschungsgemeinschaft (DFG).

REFERENCES

- ADDISON, J. T., PORTUGAL, P. (2003): Unemployment duration: Competing and defective risk, *Journal of Human Resources*, Vol. 38, pp. 156-191.
- AKAIKE, H. (1974): A new look at the statistical model identification, *IEEE Transaction and Automatic Control*, Vol. AC-19, pp. 716-723.
- BARKLEY, A. P. (1990): The determinants of the migration of labor out of agriculture in the United States, 1940-85, *American Journal of Agricultural Economics*, Vol. 72, pp. 567-573.
- BENJAMIN, D., BRANDT, L. (1997): Land, factor markets, and inequality in rural China: Historical evidence, *Explorations in Economic History*, Vol. 34, pp. 460-494.
- BLAU, D. M., RIPHAWN, R. (1999): Labor force transition of older married couples in Germany, *Labor Economics*, Vol. 6, pp. 229-251.
- BOWLUS, A. J., SICULAR, T. (2003): Moving toward markets? Labor allocation in rural China, *Journal of Development Economics*, Vol. 71, pp. 561-584.
- BUCHENRIEDER, G., KNÜPFER, J., HEIDHUES, F. (2002): A cross-country comparison of non-farm employment in the Balkans, UNIVERSITY OF HOHENHEIM (ed.): *Research in Development Economics and Policy*, Discussion Paper No. 03/2002.
- BURDETT, K., CUNNINGHAM, E. J. (1998): Toward a theory of vacancies, *Journal of Labor Economics*, Vol. 16, pp. 445-478.

- CHAN, S., STEVENS, A. H. (2001): Job loss and employment patterns of older workers, *Journal of Labor Economics*, Vol. 19, pp. 484-521.
- CHAPLIN, H., DAVIDOVA, S., GORTON, M. (2004): Agricultural adjustment and the diversification of farm households in Central Europe, *Journal of Rural Studies*, Vol. 20, pp. 61-77.
- CHEN, A. Z., HUFFMAN, W. E., ROZELLE, S. (2004): Migration and local off-farm working in rural China, paper presented at the AAEA Annual Meeting, Denver/USA, 01.-03.08.2004.
- CLEVES, M. A., GOULD, W. W., GUTIERREZ, R. G. (2002): An introduction to survival analysis using stata, Stata Press, College Station.
- CORSI, A., FINDEIS, J. L. (2000): True state dependence and heterogeneity in off-farm labour participation, *European Review of Agricultural Economics*, Vol. 27, pp. 127-151.
- DE BRAUW, A., HUANG, J., ROZELLE, S., ZHANG, L., ZHANG, Y. (2002): The evolution of China's rural labor markets during the reforms, *Journal of Comparative Economics*, Vol. 30, pp. 329-353.
- GLAUBEN, T., HERZFELD, T., TIETJE, H., WANG, X. (2004): Labor market participation of Chinese agricultural households, *Journal of Comparative Economics*, under review.
- GOULD, B. W., SAUPE, W. E. (1989): Off-farm labor market entry and exit, *American Journal of Agricultural Economics*, Vol. 71, pp. 960-969.
- IFPRI (2004): China: Government expenditure, growth, poverty, and infrastructure, 1952-2001, International Food Policy Research Institute, Washington, D. C.
- JENKINS, S. P. (1995): Easy estimation methods for discrete-time duration models, *Oxford Bulletin of Economics and Statistics*, Vol. 57, pp. 129-138.
- KALBFLEISCH, J. D., PRENTICE, R. L. (2002): The statistical analysis of failure time data, 2nd edition, John Wiley and Sons, New York.
- KEIDEL, A. (2001): China's economy: A mixed performance, *The China Business Review*, Vol. 28, pp. 8-11.
- KIEFER, N. M. (1988): Economic duration data and hazard functions, *Journal of Economic Literature*, Vol. 26, pp. 646-679.
- KNIGHT, J., SONG, L. (2003): Increasing urban wage inequality in China: Extent, elements and evaluations, *The Economics of Transition*, Vol. 11, pp. 597-619.
- LIGHT, A., OMORI, Y. (2004): Unemployment insurance and job quits, *Journal of Labor Economics*, Vol. 22, pp. 159-188.
- LIGHT, A., URETA, M. (1992): Panel estimates of male and female job turnover behavior: Can female nonquitters be identified?, *Journal of Labor Economics*, Vol. 10, pp. 156-181.
- LOVELL, J., ESPERANZA, V.-T. (2004): Seasonal adjustment in a market for female agricultural workers, *American Journal of Agricultural Economics*, Vol. 86, pp. 254-266.
- MEITZEN, M. E. (1986): Differences in male and female job-quitting behavior, *Journal of Labor Economics*, Vol. 4, pp. 151-167.
- ORAZEM, P. F., VODOPIVEC, M. (1997): Value of human capital in transition to market: Evidence from Slovenia, *European Economic Review*, Vol. 41, pp. 893-903.
- ROZELLE, S., TAYLOR, J. E., DE BRAUW, A. (1999): Migration, remittances and agricultural productivity in China, *American Economic Review*, Vol. 89, pp. 287-291.

SORM, V., TERRELL, K. (2000): Sectoral restructuring and labor mobility: A comparative look at the Czech Republic, *Journal of Comparative Economics*, Vol. 28, pp. 431-455.

SSB (State Statistical Bureau). China statistical yearbook, Beijing, various issues.

SUEYOSHI, G. (1995): A class of binary response models for grouped duration data, *Journal of Applied Econometrics*, Vol. 10, pp. 411-431.

WEISS, C. R. (1997): Do they come back again? The symmetry and reversibility of off-farm employment, *European Review of Agricultural Economics*, Vol. 24, pp. 65-84.

ZHANG, L., ROZELLE, S., HUANG, J. (2001): Off-farm jobs and on-farm work in periods of boom and bust in rural China, *Journal of Comparative Economics*, Vol. 29, pp. 505-526.

MARKET CHANNELS AND COMMERCIAL ORIENTATION IN ROMANIA*

*BORBALA BALINT***

ABSTRACT

This paper explores the differences between agricultural market channels in Romania and how these differences are important in promoting a commercial orientation, which in turn can improve the functioning of output markets. The study uses an Agricultural Household Survey from 2003 and analyses the characteristics of market channels in terms of transaction costs, transportation costs and product specificity. This study finds that selling to traders, wholesalers and processors is associated with low transaction costs and a high level of commercial orientation, while both selling at markets and to farmers involve high transaction costs and are mostly practiced by subsistence farmers. A correlation analysis at the regional level, as well as the Heckman and Tobit regressions, highlight the positive relationship between the presence of traders, wholesalers and processors and a farm's degree of commercial orientation. Promoting low transaction cost buyers – traders, wholesalers and processors – increases commercial orientation, which in turn furthers viable input and output markets, thus contributing to the overall commercialization of Romanian agriculture.

Keywords: Commercial orientation, market channels, Romania.

1 INTRODUCTION

During Romania's transition to a market economy, structural agricultural changes such as land privatisation and the downsizing of production units have taken place. As a result of reform, numerous small individual farms have emerged. However, the reforms did not focus on restructuring down and upstream sectors

* Research made possible by the Robert Bosch Foundation under the project "Policy Analysis for Sustainable Agricultural Development in Central and Eastern Europe and South Africa".

** Centre for Development Research (ZEF), Bonn, Germany, Email: babeszter@yahoo.com.

as per the needs of new agricultural producers, therefore the use of output markets involved high transaction and transportation costs. The transaction and transportation costs of the various market channels have contributed to the decrease of agricultural supply from agricultural producers and therefore a decrease in commercial orientation¹. Impact was registered in the other direction as well: The low and unstable agricultural supply from subsistence farmers further decreased the functioning and performance of output markets. This paper seeks to explore the differences in agricultural market channels in Romania in terms of transaction and transportation costs, and how these differences are important in promoting commercial orientation, which in turn can improve the functioning of output markets.

The methodology employed in this study consists of descriptive and econometric analysis. First, the output markets and commercial orientation during transition are presented and measures of commercial orientation are calculated. Various market channels are then distinguished, such as occasional sales to farmers, markets, traders, processors and wholesalers; next, market channel characteristics in terms of transaction, transportation costs and product specificity are analysed. The impact of demand from different market channels on commercial orientation is studied with the help of correlation analysis, a Heckman selection model and a Tobit model. Analysis is based on an agricultural household survey from 2003 (AHS,2003) collected as part of a PhD research.

2 OUTPUT MARKETS AND COMMERCIAL ORIENTATION DURING TRANSITION

The individual farms that have emerged in Romania during transition play mainly a social role, providing basic subsistence to rural, and in part, to the urban population (OECD, 2000). The subsistence characteristics of the new producers are related to the difficulties they face with respect to production as well as sales. The farmers lack agronomical knowledge, capital and machinery and thus have returned to traditional crops which require a low quantity of inputs. Due to the specificity of land restitution, the land owned by peasants was small and fragmented, which contributed to the increase in transaction costs for production and sales, for example in transportation and quality control. Transaction costs, together with the risk-averse attitude of the farmers, determined the diversification

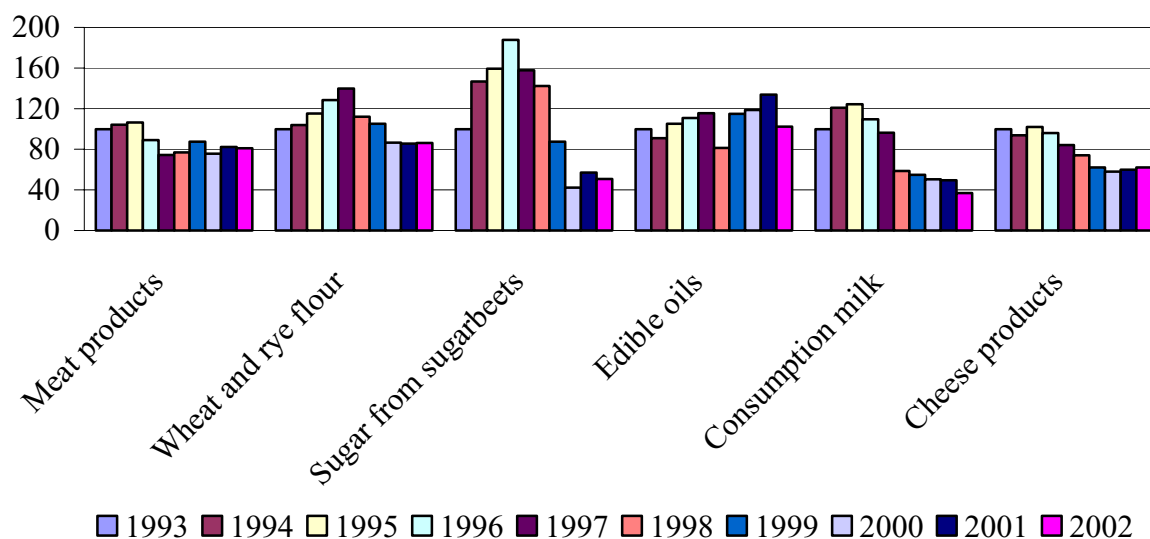
¹ Subsistence farming and commercial orientation are two complementary concepts. Subsistence farming is frequently defined as the share of production used in the self-consumption of the household. Often, a 50 % share of production for self-consumption is considered as a sign of subsistence (BRUENTRUP and HEIDHUES, 2002; WHARTON, 1969). In line with this argument, commercial orientation is defined as when more than 50 % of the output is marketed.

of agricultural production, increased self-consumption and decreased reliance on the markets. The decrease in the use of markets, through a low level of agricultural products supply, as well as input demand, has furthered the slow development of commodity markets and input provision (TESLIUC, 2000).

In addition to the characteristics of the individual farmers, the late reforms have also influenced the poor development of the farm input and output marketing system. Prior to economic transition, collective and state farms occupied 90 % of the agricultural territory, with the input and output side of production organised by state companies (KENNETH, 2003; OECD, 2000). However, reforms did not target the restructuring of down and upstream sectors in line with the needs of the individual farmers, therefore the input and output markets were not suitable for them (TESLIUC, 2000).

For example, processing factories, which represent an important channel of sales and the only outlet for some technical crops, have only slowly been privatised. Indeed, while in the 1990s several small-scale private food processing enterprises emerged, the privatisation of medium and large-scale upstream and downstream companies was rather slow, and has been accelerating only since 1998. By the end of 1999, only 36 % of the processing factories had been privatised (OECD, 2000).

Figure 1: Evolution of production 1993-2002 (1993=100)



Source: NATIONAL INSTITUTE OF STATISTICS (NIS), 2004.

Privatisation was desirable since the companies in both the upstream and downstream sector were characterised by low productivity, outdated technology, lack of adaptation to demand and a monopolistic position towards producers. In most cases, even privatisation did not bring about improvements in productivity and competitiveness. The amount of foreign direct investment in the food industry has been very low. The small- and medium-scale enterprises were privatised

mainly through management-employee buyouts, transferring the companies to employees who lacked the necessary management skills and experience as well as capital. Furthermore, bankruptcy law has not been applied for social reasons, thus blocking potentially more effective producers from overtaking the companies (OECD, 2000).

Along with the sluggishness of privatisation and structural changes in agriculture, there was an important drop in the quantity of processed agricultural products from 1990 on. Figure 1 illustrates the changes in the production of processed agricultural goods, taking 1993 as a base year with an indicator of 100.

3 COMMERCIAL ORIENTATION OF THE ROMANIAN HOUSEHOLDS

Commercial orientation is approximated on the output side as the share of agricultural sales in production (VON BRAUN, 1994). Measures of commercial orientation encountered in the empirical studies are work time of the household for household agriculture in hours per year (SEETH et al., 1998), the allocation of labour in peasant households towards non-farm work (KEISTER and NEE, 2001), total sales and total sales per hectare (MATHIJS and NOEV, 2004) or the ratio of land dedicated to individual farming (RIZOV et al., 2001).

Based on the above studies, the research uses two measures of commercial orientation: Share of sales value from production value – henceforth referred to as the commercial orientation index – and total agricultural sales.

Total sales are calculated by aggregating the value of sales for different agricultural products. For the commercial orientation index, the value of production must first be calculated. Given that the output is composed of 17 crops and 17 animals and animal products, and that prices are observed only when there are sales, it is not straightforward which price to use in the valuation of production if no sales occurred. Therefore, for the localities where there are households who produced but did not sell some products, farm-gate prices are calculated. Further, farm-gate prices are used in the valuation of production whenever there are no sales prices for the household's products². For some products, since there are not enough cases of sales and therefore price observations, farm-gate prices cannot be calculated. These products are thus left out of the commercial orientation index calculation.

Based on the calculations, the average sales value per household is 1,482 Euro for 2002, and 172 households (more than half of the sample) are sellers. The commercial orientation index is calculated for 166 households only, since farm-gate prices are not available for some products, and thus the share of sales from

² Farm-gate prices are calculated by decreasing county-level main market prices with transportation and transaction costs in order to get local level farm-gate prices.

production can not always be valued. Sellers of the products with missing farm-gate prices number 6 households, accounting for the difference in the number of observations for total sales and the commercial orientation index. The average value of the commercial orientation index is rather low – 30 % – suggesting that even the seller households have a strong subsistence characteristic (AHS, 2003).

4 MARKET CHANNELS AND THEIR CHARACTERISTICS

4.1 Transaction and transportation costs

Transaction and transportation costs are assumed to be important determinants of commercial orientation in the Romanian context. Transaction costs of sales are composed of information, negotiation, screening, enforcement and supervision costs. Information costs represent the costs of searching for a partner with whom to exchange, screening the potential trading partners' trustworthiness and searching for the best price. Bargaining costs are costs incurred when negotiating with potential trading partners in order to reach an agreement. After the transaction has occurred the agreement needs to be monitored and enforced (HOBBS, 1997; KEY et al., 2000; STAAL et al., 1997). Moreover, costs are incurred when transferring the product between the parties (KEY et al., 2000; STAAL et al., 1997).

The five market channels distinguished in AHS 2003, selling to farmers, traders, selling on the market, selling to processors and wholesalers³, have different characteristics with respect to transaction and transportation costs and thus have an important influence on market participation and the commercial orientation of the Romanian households.

Selling to local farmers or at the market involves a high level of uncertainty with respect to price and demand, as well as high search costs. For example, farmers spend several days at the market waiting for buyers. Selling to traders involves lower uncertainty and less search costs, with the traders usually coming to the village every year at harvest time. Processors and wholesalers represent more certain demand and low search costs, since farmers are, in general, knowledgeable about the demand of these entities and about price (own interviews). A further factor decreasing fixed transaction costs is the difference in the scale of sales to different channels (Table 1). The average value sold per household increases as the market channel changes from farmers to market, then to traders, to wholesalers, and finally to processors.

³ From the market channels, an "other" channel which could not be classified in any of the above categories is left out of the analysis. The "other" channel was used by only 1 % of sellers.

Table 1: Differences between market channels

| | Farmer | Market | Trader | Wholesaler | Processors |
|---|---------------|---------------|---------------|-------------------|-------------------|
| Avg. value sales per seller (Euro) | 627 | 689 | 800 | 1,055 | 1,535 |
| Share of sellers using a given market channel (%) | 25 % | 22 % | 18 % | 7 % | 26 % |
| Avg. distance of transport (km) | 1.6 | 12.0 | 2.0 | 3.6 | 5.6 |
| Max. distance of transport (km) | 25.0 | 40.0 | 30.0 | 25.0 | 32.0 |

Source: AHS, 2003.

Notes: Avg. = average, max. = maximum.

Even if there is a difference between the market channels in terms of transaction costs, the relation between market channels and commercial orientation is not straightforward. Differences in transaction costs are translated in differences in prices. The prices for all crops and animal products are, depending on the product, on average, 4-52 % lower when selling to a trader, wholesaler or processor than the price when selling to farmers or at the market (AHS, 2003). Moreover, traders, wholesalers and processors paid late in 7 % of the cases, while there was no delayed payment when selling to the farmer or market (AHS, 2003). In addition, some low transaction cost alternatives such as processing factories are in a phase of restructuring, which means high uncertainty with respect to their performance, such as demand and payment capacity.

A larger quantity demanded from processors and wholesalers may imply a low number of sellers. Large amounts bought from each peasant means that there is more scope for large farmers, not as much for subsistence farmers, to sell. Processing factories have certain quality requirements which may render unlikely a high share of participation in the output markets.

Differences in transportation costs for different market channels also complicate the interaction between market channels and market participation. Some of the market channels have specific transportation costs, for example sales to farmers usually occurred at the local level and sales to traders occurred either in the village or at a distance close to the village, therefore these two market channels have very low transportation costs. Wholesalers and processors are located further away, while the highest is the average distance of transportation to the market (Table 1).

Although, as pointed out above, it is possible that the difference in transaction costs of the market channels are offset by the differences in prices, risks and specific transportation costs of the channels, for simplicity the market channels are categorised in terms of transaction cost differences. Thus, below, low transaction cost market channels – traders, wholesalers, processors – and high transaction cost market channels – markets, farmers – are distinguished.

4.2 Product specificity

Different products have various market channels and different degrees to which they are marketed and are commercial. For example, processing is targeting certain products like wheat, rye, sugar beets, sunflower, milk, milk products and meat products. Some of these products – like sugar beets and sunflower – in an unprocessed form have very little use for peasants. Therefore, peasants usually decide to sell these products the moment they decide to produce them.

Table 2 and Table 3 illustrate the relationship between the different products and product groups as well as commercial orientation. The products and product groups are described in terms of percentage of producers from all households, sellers from producers and share of sales from total production in the case of sellers. At some product groups where farm-gate prices were not calculated, the share of sales value from production value is not reported. This is the case for animal feed, fruits and vegetables in Table 2, and for subsistence food products in Table 3.

Table 2: Commercial orientation and market channel characteristics of crops

| | Producers from all households | Sellers from producers | Share of sales from prod. | Share of sellers to low TC Buyers |
|------------------------|-------------------------------------|---------------------------|------------------------------|---|
| Grains | 94 % | 10 % | 42 % | 53 % |
| Potatoes | 28 % | 11 % | 40 % | 40 % |
| Technical crops | 23 % | 48 % | 91 % | 91 % |
| Animal feed | 42 % | 5 % | – | 0 % |
| Vegetables | 9 % | 15 % | 70 % | 0 % |
| Fruits | 8 % | 29 % | 63 % | 29 % |
| Grapes | 29 % | 20 % | 80 % | 72 % |

Source: AHS, 2003.

Notes: Prod. = production; TC = transaction costs; grains = wheat, corn, oat, barley, rye; technical crops = sunflower, soya, sugarbeet; animal feed = fodder, hay, lucerne.

According to the information presented in Table 2, different crops can be distinguished depending on lower or higher subsistence orientation. Grains such as wheat, corn, oat, barley and rye as well as potatoes are produced in most of the households. They are sold in about 10 % of the cases and the sellers commercialise less than half of the production. These crops have more of a role providing the households and their livestock with food and less of a commercialisation role. Technical crops –sunflower, soya and sugar beets – are cash crops, produced only in one quarter of the households, sold by about half of the producers, and the share of sales from total production is very high. The role of grapes as cash crops depends on the region; in regions specialised in wine production they are cash crops, in the rest they contribute to the diet of the household. Vegetables and fruits are occasionally produced and sold, thus, they could be considered as cash crops in part, as they complement household income. Hay, lucerne and

fodder are subsistence crops used for feeding animals, and are often produced but almost never sold.

In addition to the subsistence nature of the products, the type of market channel used in commercialisation is presented. Table 2 illustrates that the more commercial the product or product group is, the more often it is commercialised through low transaction cost market channels. Indeed, the highest share commercialised through low transaction cost market channels occurred in the case of technical crops, followed by grapes, grains, potatoes and fruits. Vegetables and animal feed were not sold to traders, wholesalers or processors.

Table 3: Commercial orientation and market channel characteristics of animals and animal products.

| | Producers from all households | Sellers from producers | Share of sales from prod. | Share of sellers to low TC buyers |
|----------------------------------|-------------------------------------|---------------------------|---------------------------------|--|
| Cattle | 60 % | 37 % | 56 % | 43 % |
| Horses | 35 % | 13 % | 12 % | 7 % |
| Donkeys | 2 % | 0 % | 0 % | – |
| Pig | 88 % | 26 % | 56 % | 40 % |
| Sheep | 30 % | 18 % | 64 % | 41 % |
| Subsistence food products | 99 % | 3 % | – | 9 % |
| Animal products | 98 % | 26 % | 52 % | 37 % |

Source: AHS, 2003.

Notes: Prod. = production; TC = transaction costs; cattle = cow, oxen, bulls; subsistence food products = rabbits, poultry, bees, pork meat, chicken meat, beef meat, meat products; animal products = milk, cheese, eggs.

In the case of animals and animal products, several groups can be distinguished according to the commercial character of the product and its role in consumption (Table 3). Therefore, livestock such as cattle, pigs and sheep are frequently owned by the household, and are sold in a third of the cases. They could thus be classified as semi-subsistence products. Subsistence food products – rabbit, poultry, pork, beef and other meat products – are bred or produced in all the households and almost never sold. Indeed, livestock owned by the household is the source of meat products for self-consumption. Milk, cheese and eggs form an animal product group which is always produced, and in one-third of the cases marketed. In terms of commercial orientation, except for subsistence food products, horses and donkey, all the animals and animal products are, in more than half of the cases, commercialised.

The commercial characteristic of the products and the type of market channels where they are most often marketed display patterns similar to the case of crops. Subsistence food products, horses and donkeys are least often marketed through low transaction cost market channels, while semi-subsistence animal products,

cattle, pig and sheep are sold to wholesalers, traders and processors in slightly less than half of the cases.

4.3 Correlation analysis

In order to understand the relationship between different sales channels and market participation, it is necessary to analyse some correlation coefficients at the regional level. Table 4 presents the correlation of two market channel characteristics with the percentage of sellers and the share of sales from the total production of the respective localities. The market channel characteristics are the regional share of sales to different market channels and the percentage of sellers which sell to a given market channel from total sellers in the locality. Only few correlations are significant, owing to the fact that the correlation was performed on just 15 observations from the 15 localities where the survey was conducted.

Table 4: Correlation between the regional characteristics of market channels and sales

| Market channels | Corr. of share of sales in total loc. sales to different market channels, with: | | | | Corr. of share of sellers from loc. Sellers which sell to different market channels, with: | | | |
|-------------------------------|---|---|------------------------------|--|--|-----|------------------------------|-----|
| | % of sellers in loc. | | Loc. share of sales in prod. | | % of sellers in loc. | | Loc. share of sales in prod. | |
| Farmer | -0.07 | | -0.05 | | -0.41 | | -0.08 | |
| Market | 0.04 | | -0.43 | | -0.36 | | -0.51 | ** |
| Trader | 0.48 | * | 0.22 | | 0.46 | * | -0.10 | |
| Wholesaler | -0.17 | | 0.07 | | 0.47 | * | 0.24 | |
| Private processor | -0.21 | | -0.10 | | -0.07 | | 0.04 | |
| State processor | 0.02 | | 0.25 | | 0.65 | *** | 0.78 | *** |
| Wholesaler and processors | -0.23 | | 0.18 | | 0.36 | | 0.52 | ** |
| Trader, wholesaler and procs. | 0.03 | | 0.31 | | 0.44 | * | 0.30 | |
| Farmer and market | -0.04 | | -0.32 | | -0.31 | | -0.30 | |

Source: AHS,2003.

Notes: Corr. = correlation, loc. = locality, prod. = production, procs. = processors, *** Significance at 1 % level, ** Significance at 5 % level, * Significance at 10 % level.

Table 4 illustrates that the two types of market channel characteristics correlate in different patterns with the percentage of sellers in the locality and the share of sales in total production. The share of sales to high/low transaction cost market channels does not correlate with market participation. Even more strikingly, the share of sales to wholesalers and processors correlates negatively with market participation. This finding is contrary to the correlation between the share of sellers from total locality sellers which sell to wholesalers and processors and market participation. At the same time, the percentage of sellers in the locality positively correlates with the percentage of sellers from total locality sellers to low transaction cost alternatives – traders, wholesalers and processors – and

negatively correlates with the share of sellers which sell to high transaction cost alternatives. The findings highlight that in the case of a large share of sales to wholesalers and processors, only few farmers participate in the market. This finding parallels the fact that a larger average quantity is sold to wholesalers and processors than to other market channels (Table 1).

In the case of the locality-specific share of sales from total production correlation, both the share of sales in the locality to a given market channel and the share of sellers from locality sellers which sell to a given market channel exhibit more or less similar patterns. The locality-specific commercial orientation index positively correlates with the share of sales to low transaction cost buyers and with the share of sellers in the locality to low transaction cost buyers. The commercial orientation index negatively correlates with the share of sales value to high transaction cost buyers and with the share of sellers to high transaction cost buyers.

In the case of processors we notice a peculiar impact, since state-owned processors have a positive impact, while privatised processors have a small negative or no impact on the percentage of sellers and share of sales from total production. This could be explained by the fact that privatised companies do not always perform well. Indeed, as mentioned, in most cases privatisation has occurred through employee-management buyout, therefore worsening the lack of capital and know-how and the performance of the privatised processors (OECD, 2000). Another explanation is that peasants associate positive experiences with the state enterprises and many of them nostalgically think back to communist times. It is possible that whenever peasants had positive experiences with the processors, they tended to report that they sold to state-owned enterprises. At the same time, it could be that the enterprises had already been privatised.

5 RELATION OF MARKET CHANNELS TO COMMERCIAL ORIENTATION

The problem of commercial orientation can be conceptually defined with the help of an agricultural household model incorporating transaction costs (KEY et al., 2000; OMAMO, 1998). The model is estimated econometrically with the help of a sample selection model (GOETZ, 1995).

The sample selection model can be estimated by Heckman's two-step estimation or by Heckman's Maximum Likelihood Estimation (MLE), as well as by Tobit estimation. In the Heckman two-step estimation, first the decision to sell is regressed on different factors, and the Mills ratio is calculated. In the second stage, an ordinary least square (OLS) regression is used and total sales respective to the share sold from total production are regressed on the independent variables

and the inverse Mills ratio. The MLE jointly estimates selection and the second stage regression while accounting for the selection bias (GOETZ, 1995).

Besides the Heckman selection model, another model employed in the analysis of commercial orientation is the Tobit model. While the Heckman model has the advantage of pointing out separate impacts of variables on the decisions of market participation and the intensity of participation – sales and commercial orientation – the Tobit model can show the impact of variables which jointly affect the probability of participation and intensity of participation. Therefore, for a thorough analysis of the impact of market channels on commercial orientation, both the Heckman and the Tobit models are used (GOETZ, 1995).

5.1 Variables

The dependent variables in the models are the square root of sales and the square root of the transformed commercial orientation index⁴. Square root transformations are applied in order to bring the distribution of sales and commercial orientation closer to the truncated normal distribution.

The explanatory variables consist of household characteristics, prices, production characteristics, production factors, transaction costs – approximated partly by market channels – and transportation costs. As household characteristics, size, the age of the head of household, gender and education are analysed. Wheat and milk prices are used in the regression from the 20 agricultural products prices used for calculating the commercial orientation index. Including more prices would lead to the loss of degrees of freedom and would likely introduce multicollinearity, since most product prices correlate with each other.

The number of agricultural products produced by the household represents production characteristics in the regression. Production factors are cultivated land size, family and hired labour, machinery, livestock and amount of yearly non-agricultural income⁵. For the purpose of normalisation, cultivated land size, family labour, hired labour and livestock are included in the square root form.

The locality share of sellers which sell to low transaction cost buyers is used as an approximation for transaction costs. Other variables approximating transaction and transportation costs are an indicator of informal cooperation, the locality output-weighted average distance to the sales point, the type of road leading to the village and a dummy for the counties from Transylvania where formal cooperative forms existed.

⁴ The commercial orientation index is a bounded variable between 0 and 1, and for the purposes of estimation needs to be transformed into a positive unbounded variable. The transformation, following ROLLER and WAVERMAN, 2001, is: Commercial orientation index / (1-commercial orientation index).

⁵ Only non-agricultural income is included in the regression in order to avoid endogeneity problems, which would likely be the case if the whole income would be included.

The approximation of most of the variables is self-explanatory and their measurement unit is reported together with the regression results. Some of the variables not clarified in the regression results are explained in the following.

Machinery is by calculated adding 1 for the ownership of a truck, 1 for the ownership of a tractor, 0.2 for the ownership of a plough for the tractor, 2 for the possession of a combine, 0.5 for the ownership of a carriage and 1 for the ownership of a harvesting machine. Therefore, machinery takes a minimum value of 0 and a maximum value of 5.7. Livestock is calculated by adding the number of cattle, the number of pigs multiplied by 0.5 and the number of sheep multiplied by 0.3. The calculations for livestock and machinery are based on the methodology of another study on Romania (RIZOV et al., 2001).

The approximation for informal cooperation is a variable with the value of one if the household cooperated with the owners of the neighbouring plot with respect to the planting of compatible crops, and zero if not. This variable is a rough approximation of informal cooperation; however, it is the only one available. The variable formal cooperation takes the value of one for localities with professional associations, and zero otherwise.

5.2 Heckman and Tobit regressions

Some variables in the Heckman regression influence the decision to sell, but not the amount sold or the commercial orientation index, and vice-versa. Therefore, the variables included in the selection equation and in the regression of the amount sold and commercial orientation – in what follows referred to as the intensity regression – differ to some extent. The difference between the variables in the two parts of the Heckman regressions is important for avoiding a high correlation between the inverse Mills ratio calculated from the selection equation and the explanatory variables of the intensity regressions.

Age, age squared and age cubed are included in the selection equation, based on the examination of the graphical relationship of age and probability of sales. Indeed, when testing the model with age (model 1), age and age-squared (model 2) and age, age squared and age cubed (model 3), the Akaike information criteria (AIC) suggests that the best model is model 3 (AIC 294.4), then model 1 (AIC 295.8) and finally model 2 (AIC 296.5). In the intensity regressions, only age is included.

Other differences are the inclusion of the number of products in the intensity regression but not in the selection equation. A low number of products and thus high specialisation is expected to promote commercial orientation and sales, while it is expected to have no impact on the decision to sell.

The variable approximating transaction costs, the percentage of sellers to a low transaction cost alternative from total sales, is included in both the selection equation and the intensity regression. However, while in the selection equation

the share of sellers in the locality which sell to a low transaction cost alternative from total village sellers is used, in the intensity regression, the individual share of sales value to a low transaction cost alternative from total sales value is included. The case for the distance to the sales point is similar, where the explanatory variable in the selection equation is the output-weighted distance of transportation to the sales point specific for the village, calculated by averaging the output-weighted distances across all villagers. The weighted average distance is calculated from the distance of transportation for different agricultural products weighted by the share of sales value of the products in total sales, taking into consideration only distances below 60 km⁶. In the intensity regression, the weighted average distance of transportation specific to the individual households is included.

The dummy of formal cooperation is included in the selection equation but not in the intensity of participation regression. It is expected that formal cooperation will lower fixed transaction costs and thus influence market participation, but not the degree of participation. Indeed, the agricultural household model suggests that fixed transaction costs will only influence the market participation decision (KEY et al., 2000).

In the Tobit regression, most variables present in the Heckman regressions are included. Here, the locality-specific market channels and transportation distances are used since the dependent variables in the Tobit regression refer to both non-sellers and sellers.

Table 5 presents the results of the Heckman and Tobit regressions. The Heckman regression is approximated by MLE, since, if the underlying assumptions of the model are correct, MLE is a more efficient estimation method than the two stage regression (WOOLDRIDGE, 2002, pp. 385-386). The Tobit and the Heckman regression results are similar, and there are no cases where the Heckman selection and intensity regression coefficients would both be insignificant, while being significant in the Tobit regression. Therefore, significant Tobit coefficients reflect either the selection or the intensity of participation effects, or both. Given the redundant nature of the Tobit regression results to the Heckman regression results, the Tobit regression coefficients are not discussed.

⁶ Four cases with more than 60 km transportation are left out from the calculations. Indeed, distances longer than 60 km may be due to considerations other than sales (e.g. a scheduled trip).

Table 5: Heckman and Tobit regression results

| | Heckman MLE | | | | Tobit | |
|--|---------------------------|------------------------------|----------------------|--------------------------------|---------------------------|----------------------|
| | Sqrt. agric. sales (Euro) | Selection sqrt. agric. Sales | Sqrt. com. or. index | Selection sqrt. com. or. Index | Sqrt. agric. sales (Euro) | Sqrt. com. or. index |
| Household size | -0.81 | -0.09* | -0.03 | -0.11** | -2.25*** | -0.07** |
| Age head (years) | -0.14** | -0.56*** | -0.01** | -0.58*** | -0.12 | -0.00 |
| Age head squared | | 0.01** | | 0.01*** | | |
| Age head cube | | -0.00** | | -0.00** | | |
| Education (1-12 years or more, 0-11 years or less) | 5.72** | -0.05 | 0.08 | 0.02 | 4.79 | 0.06 |
| Wheat price (thou ROL) | 1.81* | -0.17 | 0.09* | -0.13 | -0.78 | -0.02 |
| Milk price (thou ROL) | 0.42 | 0.26*** | -0.02 | 0.25*** | 2.88*** | 0.07** |
| Agric. products in household | -0.76** | | -0.03** | | 0.30 | 0.03 |
| Sqrt. cultivated land (ha) | 4.53*** | 0.44** | 0.06 | 0.52*** | 6.88*** | 0.15** |
| Sqrt. family labor (man-days/month) | 0.12 | 0.04 | -0.03* | 0.03 | 0.43 | -0.00 |
| Sqrt. hired labor (man-days/month) | 0.95** | 0.28*** | 0.03 | 0.24*** | 1.10* | 0.02 |
| Machinery | 2.11* | 0.20 | -0.03 | 0.24 | 1.75 | -0.03 |
| Sqrt. Livestock | 3.47** | 0.63*** | -0.05 | 0.65*** | 7.86*** | 0.09* |
| Owner of car (1=yes, 0=no) | 4.94** | -0.07 | 0.16** | -0.10 | 3.77 | 0.10 |
| Non-agric. income (Euro) | 0.00 | 0.00* | 0.00 | 0.00** | 0.00** | 0.00** |
| Informal coop. (1=yes, 0=no) | 3.05** | 0.30* | 0.07 | 0.36** | 5.32** | 0.13 |
| Individual share of sales in total to low TC buyers | 2.39 | | 0.11* | | | |
| Share of sellers in locality selling to low TC buyers | | 1.35*** | | 1.27*** | 20.55*** | 0.87*** |
| Individual transp. dist.(km) | -0.16 | | -0.01* | | | |
| Locality transp. dist. (km) | | -0.11*** | | -0.11*** | -1.24*** | -0.04*** |
| Formal coop. (1=yes, 0=no) | | 0.57** | | 0.64*** | 4.46 | 0.11 |
| Constant | 15.14 | 6.96* | 1.39*** | 7.25** | -41.61*** | -0.91* |
| Observations | 286 | 286 | 287 | 287 | 288 | 289 |

Source: AHS,2003.

Notes: Sqrt. = square root, agric. = agricultural, com.or. = commercial orientation, thou = thousand, coop.= cooperation, TC = transaction costs, transp. dist. = transportation distance, *** Significance at 1 % level, ** Significance at 5 % level, * Significance at 10 % level.

Gender and road type to locality are insignificant and are not reported in the table.

The Wald test for the Heckman selection model rejects the hypothesis that there would be selection bias. Therefore, the sales and commercial orientation regressions could be estimated by OLS regression without encountering the omitted variable problem (WOOLDRIDGE, 2002, pp. 563).

The individual share of sales to low transaction cost market channels positively influences commercial orientation. Moreover, the locality share of sellers to low transaction cost buyers positively influences market participation. These findings suggest that besides proportional transaction costs, households face important fixed transaction costs. Thus, the low transaction cost buyers – wholesalers, traders and processors – promote market participation through lower market entry costs.

Other proxies for transaction costs and transportation costs, such as informal cooperation, low distance and formal cooperation, all promote market participation. Interestingly, informal cooperation plays an important role in the quantity sold, not in the share sold from total production, while the individual share of sales to low transaction cost buyers, similar to the individual distance to the sales point, is more important for commercial orientation than for sales. Indeed, one would expect that cooperation with neighbours may reduce transaction costs and thus increase sales. However, commercial farmers do not sacrifice much time for building informal relationships.

Besides transaction and transportation costs, several other factors turn out to be important for commercial orientation. The fewer members the household has, the higher is market participation. Youth is an important factor in market participation and sales, as well as commercial orientation. Education plays an important role in the amount sold; however, not in market participation.

Wheat prices are important for the intensity of market participation – sales and commercial orientation – while milk prices are important factors determining the decision to sell. If one considers that wheat prices stand for the commercial and semi-commercial crops and milk for animal products, the results suggest that there is a higher potential for crop producers to become commercial and sell more, while this is not so much the case for those with animal products. Animal products and their prices, given their perishable nature, are more likely to influence the household in its decision to sell.

The number of products produced has a negative impact on the intensity of market participation, specialisation in few products, promoting the amount sold and commercial orientation.

Factors of production such as cultivated land size, hired labour and livestock positively influence market participation and the amount sold. Machinery positively influences the amount sold, car ownership promotes the amount sold and commercial orientation, while non-agricultural income – although with a low value – is influential on the decision to sell. The degree of commercial orientation is negatively influenced by household labour. The positive impact of hired labour

and negative impact of family labour illustrates that commercial farmers rely on hired labour and not on family resources.

6 CONCLUSION

The paper addresses the issue of how differences in Romanian market channels determine commercial orientation. For this purpose, the characteristics of different market channels are analysed and their relation to commercial orientation is studied with the help of correlation analysis, Heckman and Tobit regressions.

The paper finds that low transaction cost market channels – traders, wholesalers and processors – as well as high transaction cost market channels – farmers and markets – can be distinguished. The correlation analysis and the econometric estimations show that the more sellers in the locality sell to traders, wholesalers and processors, the more likely is market participation and the higher is the amount sold and degree of commercial orientation. Moreover, the higher the individual share of sales value to traders, wholesalers and processors, the more commercially-oriented the household is and the more it sells.

The regressions also highlight other factors which influence market participation and commercial orientation. Informal and formal cooperation, as well as low transportation costs, are important determinants of market participation and/or the degree of market participation. Head of household characteristics – youth, education – small household size, and production factors such as land, hired labour, machinery, income and car ownership all promote market participation and/or the intensity of participation. Wheat prices are important for the intensity of market participation, while milk prices, similar to livestock ownership, are influential on the decision to sell. A high amount of family labour employed in the household decreases commercial orientation.

In order to further farms' commercial orientation, policy makers should encourage: The replacement of malfunctioning processing companies with viable ones; the improvement of their functioning; and the establishment of new processing factories and collection points. The resulting increased commercial orientation could then promote viable input and output markets and thus contribute to the overall commercialisation of Romanian agriculture.

REFERENCES

- AGRICULTURAL HOUSEHOLD SURVEY (2003): by BORBALA BALINT under PASAD project.
- BRUENTRUP, M., HEIDHUES, F. (2002): Subsistence agriculture in development: It's role in the processes of structural change, INSTITUTE OF AGRICULTURAL ECONOMICS AND SOCIAL SCIENCES IN THE TROPICS AND SUBTROPICS, UNIVERSITY OF HOHENHEIM (ed.): *Discussion Paper No. 1*, Hohenheim.

- GOETZ, S. (1995): Markets, transaction costs and selectivity models, in: SCOTT, G. J. (ed.): *Prices, Products and People: Analyzing Agricultural Markets in Developing Countries*, Lynne Rienner Publishers, London, pp. 383-399.
- HOBBS, J. (1997): Measuring the importance of transaction costs in cattle marketing, *American Journal of Agricultural Economics*, Vol. 79 (4), pp. 1083-95.
- KEISTER, L. A., NEE, V. G. (2001): The rational peasant in China. Flexible adaptation, risk diversification and opportunity, *Rationality and Society*, Vol. 13 (1), pp. 33-69.
- KENNETH, J. T. (2003): Introduction: The context for reform and accession, in: DAVIDOVA, S., THOMSON, K. J. (eds.): *Romanian Agriculture and Transition towards the EU*, Lexington Books, Oxford, pp. 1-15.
- KEY, N., SADOULET, E., DE JANVRY, A. (2000): Transaction costs and agricultural household supply response, *American Journal of Agricultural Economics*, Vol. 82 (2), pp. 245-59.
- MATHIJS, E., NOEV, N. (2004): Subsistence farming in Central and Eastern Europe: Empirical evidence from Albania, Bulgaria, Hungary, and Romania, *Eastern European Economics*, Vol. 42 (6), pp. 72-89.
- NATIONAL INSTITUTE OF STATISTICS (NIS) (2004): Anuarul statistic al Romaniei-2003 [Romanian Statistical Yearbook-2003].
- OECD (2000): Review of agricultural policies Romania, OECD Center for Cooperation with Non-Members, Paris.
- OMAMO, S. W. (1998): Transport costs and smallholder cropping choices: An application to Siaya District, Kenya, *American Journal of Agricultural Economics*, Vol. 80, pp. 116-123.
- RIZOV, M., GAVRILESCU, D., GOW, H., MATHIJS, E., SWINNEN, J. F. M. (2001): Transition and enterprise restructuring: The development of individual farming in Romania, *World Development*, Vol. 29 (7), pp. 1257-1274.
- ROLLER, L., WAVERMAN, L. (2001): Telecommunications infrastructure and economic development: A simultaneous approach, *The American Economic Review*, Vol. 91 (4), pp. 909-923.
- SEETH, H. T., CHACHNOV, S., SURINOV, A., VON BRAUN, J. (1998): Russian poverty: Muddling through economic transition with garden plots, *World Development*, Vol. 26 (9), pp. 1611-1623.
- STAAL, S., DELGADO, C., NICHOLSON, C. (1997). Smallholder dairying under transaction costs in East Africa, *World Development*, Vol. 25 (5), pp. 779-794.
- TESLIUC, E. D. (2000): Agriculture policy: Achievements and challenges, paper presented at the World Bank conference "Romania 2000. 10 Years of Transition – Past, Present and Future", Bucharest/Romania, 21.-22.10.1999.
- VON BRAUN, J., BOUIS, H., KENNEDY, E. (1994): Conceptual framework, in: VON BRAUN, J., KENNEDY, E. (eds.): *Agricultural Commercialization, Economic Development and Nutrition*, Washington D. C., International Food and Policy Research Institute, pp. 11-13.
- WHARTON, C. R. (1969): Subsistence agriculture: Concepts and scope, in: WHARTON, C. R. (ed): *Subsistence Agriculture and Economic Development*, Aiding, Chicago.
- WOOLDRIDGE, J. M. (2002): *Econometric analysis of cross section and panel data*, The Massachusetts Institute of Technology Press, Massachusetts.

POLICY INTERVENTION

LAND REFORM AND THE DEVELOPMENT OF AGRICULTURAL LAND MARKETS IN RUSSIA

ZVI LERMAN¹, NATALYA SHAGAIDA²

ABSTRACT

Russia has experienced dramatic changes in land ownership and land tenure since the dissolution of the Soviet Union in 1991: Agricultural land has been largely privatized, individual landowners now have legal rights to most agricultural land in the country, and previous prohibitions on buying and selling land have recently been removed. The necessary pre-conditions for the development of agricultural land markets have been met and we are beginning to witness transactions that involve individual landowners, not just the state. However, further development of the embryonic land market is severely circumscribed by the inadequacy of the administrative and technical infrastructure. In this paper we discuss the evolving legal framework for land reform, consider the impacts of land reform on privatization and ownership structure of agricultural land, and analyze the development of land market transactions. The analysis is based on official statistical sources and the results of a questionnaire-based survey conducted by the authors in 2003 in three regions. The paper concludes with a review of the existing constraints on land transactions and some policy recommendations.

Keywords: *Agricultural land markets, land transactions, land leasing, land reform, transition countries, Russia.*

¹ Department of Agricultural Economics and Management, The Hebrew University, Rehovot 76100, Israel, E-mail: lerman@agri.huji.ac.il.

² VIAPI – Russian Institute for Agrarian Problems and Informatics, Moscow, Russia, E-mail: nshagaida@raf.org.ru.

1 INTRODUCTION

Russia ranks fifth in the world in agricultural land area (after China, Australia, USA, and Brazil)³. At 220 million hectares, Russia's agricultural land matches that of the whole of Europe and is about 40 % of the agricultural land in China or in all 15 countries of the former USSR combined. Russia usually has a reputation for being a land-rich (*mnogozemel'naya*) country. Russia's endowment of agricultural land is 5.5 hectares per rural resident, which is actually less than in the United States (6.3 hectares per rural resident), but much more than in China (0.7 hectares per rural resident) or India (0.3 hectares per rural resident). Availability of agricultural land is thus not a constraint in Russia, and yet land ownership is an emotionally charged issue that cuts across all segments of the population.

This paper examines the dramatic changes in land ownership and land tenure that have occurred in Russia since the dissolution of the Soviet Union in 1991. We start with a discussion of the legal framework for land reform that crystallized in the early 1990s and has continued to evolve ever since; consider the impacts of land reform on privatization and the ownership structure of agricultural land; and analyze the development of land market transactions. The analysis is based on official national sources and the results of a questionnaire-based survey conducted by the authors in 2003.⁴ We conclude with a review of the existing constraints on land transactions and some policy recommendations.

2 LEGAL FRAMEWORK AND LAND REFORM OUTCOMES

Russia's agricultural land area has remained remarkably stable, at 220 million hectares, since 1990. On the other hand, agricultural land used by producers (both corporate and individual farms) dropped from 214 million hectares in 1991 to 195 million hectares in 2003 – a decrease of 16 % during transition. The share of agricultural land used by farms declined from 96 % in 1991 to 88 % in 2003. The remainder was transferred, primarily, to the state land reserve, which is a pool of land available for allocation to producers but not currently in use. The reclassification of land from farm use to rural municipalities also contributed to this decrease. The main change in agricultural land use occurred in 1998-99, when reserve land and land controlled by municipalities (and other users) abruptly doubled from 13 million hectares to 26 million hectares.

³ The data in Section 1 are based on FAOSTAT – FAO's on-line database, <www.fao.org>.

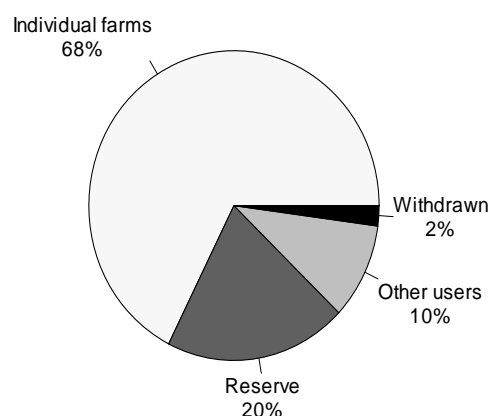
⁴ The survey, referred to as the 2003 BASIS survey, was implemented by the Analytical Centre on Agri-Food Economics in Moscow as part of the BASIS/CRS research project *Land, Labor, and Purchased Input Market Constraints on Economic Growth in Russian Agriculture: Analysis of Current Conditions and Policy Options*.

Table 2.1 shows the structure of agricultural land resources, by users, in 1991 and 2003. In addition to the features discussed above, the table demonstrates the substantial transfer of land from corporate farms (former *kolkhozes* and *sovkhoses*) to the individual sector: Corporate farms lost 59 million hectares, or nearly 30 % of their total land endowment in 1991, while the individual sector gained 40 million hectares (the remainder was absorbed by the state reserve and by user reclassification). The distribution of land flow between 1991 and 2003 is illustrated in Figure 2.1.

Table 2.1 Structure of agricultural land by users in 1991 and 2003 (beginning of year)

| | Million ha | | Percent | |
|---|------------|-------|---------|-------|
| | 2003 | 1991 | 2003 | 1991 |
| Total agricultural land | 220.9 | 222.1 | 100.0 | 100.0 |
| Used by farms | 194.6 | 213.8 | 88.1 | 96.3 |
| Corporate farms | 150.4 | 209.8 | 68.1 | 94.5 |
| Peasant farms | 17.0 | 0.1 | 7.7 | 0.0 |
| Household plots | 11.8 | 3.9 | 5.3 | 1.8 |
| Municipal meadows and pastures in household use | 15.4 | 0 | 7.0 | 0 |
| Reserve land | 13.8 | 1.8 | 6.2 | 0.8 |
| Other users | 12.5 | 6.5 | 5.7 | 2.9 |

Fig. 2.1. Agricultural land flows 1991-2003



In percent of total redistributed land (59.4 mln ha)

Source: GOSKOMSTAT, 2003a.

2.1 Historical background

Land in Russia (and in other parts of the former czarist empire) was nationalized within days of the Bolshevik revolution in October 1917, as Lenin's Decree on Land (*Dekret o zemle*) transferred all land to the state and prohibited private land ownership. "Land to the peasants" was the slogan that the Bolsheviks used to

attract the largely conservative peasantry to the revolutionary cause. Indeed, after 1917, the land from large estates was distributed to the landless and the land-poor, and communal land was generally transferred to individual use (in a sense completing Stolypin's unfinished reform that began in 1905 and was interrupted by the outbreak of World War I in 1914). Although the Bolshevik platform from the start advocated collective farming as the road to socialism, individual farming dominated the Russian rural scene throughout the 1920s. Thus, of the 20 million hectares distributed to the rural population from 1917-19, fully 95 % went to peasant families and only 5 % to various collectives and state farms.

It was only in 1929 (after the severe grain procurement shortfalls of 1927-28) that Stalin initiated a forceful and brutal collectivization program, which rapidly led to total elimination of individual farming and the establishment of collective and state farms (*kolkhozy* and *sovkhozy*) as the monopolistic organizational form in Soviet agriculture. Russian peasants who had received individual land plots only a decade earlier were now forced to put their land and assets in collective farms. By the end of the 1930s, a relatively small number of socialized, or "public-sector" farms (about 30,000 in total) controlled 98 % of agricultural land and produced most of the commercially marketed output.

However, despite pervasive collectivization and monopolistic state ownership of land, individual or private agriculture quickly reemerged in a different guise. Independent peasants had disappeared, but millions of rural households were now allowed to cultivate small plots of less than 0.5 hectare, producing mainly for subsistence (although part of the output always found its way to farmers' markets in nearby towns). The policy of allowing small-scale private farming on household plots within large collectives was implemented as a measure for improving rural family incomes and mitigating the resistance of the peasantry to socialized agriculture. Household plots operated by employees of collective farms and other village residents controlled, in aggregate, 2 % of agricultural land, but still managed to produce 20 % of gross agricultural output. During most of the Soviet period, Russia's agriculture was thus characterized by a dual farm structure in which commercial production from collective and state farms was supplemented by subsistence-oriented individual agriculture based on small household plots within the large collectives.

Since the 1930s, collective and state farms were given state-owned land for permanent, perpetual use, without any payment. Transfers of land between these large corporate farms were initiated by orders from the authorities, as part of often changing government programs that aggregated or disaggregated collective farms and transformed *kolkhozes* into *sovkhozes* (or back). Rural households typically received their plots through use rights from the local collective farm and generally enjoyed security of tenure (subject to the administrative whims of the local authorities).

2.2 Reform legislation

After more than seven decades of state monopoly in land ownership, the first signs of readiness to reform the Soviet system were incorporated in the 1989 *Principles of Land Legislation of the USSR*. This Union-level law relaxed the traditional policy of giving state land in use rights only, and introduced a new category of land tenure for rural households – lifetime inheritable possession (*pozhiznennoe nasleduemoie vladenie*). Security of tenure was formally ensured, but land transactions (including subleasing) were absolutely prohibited. From this point on, Russia took over the land reform initiatives from the USSR legislators. In October 1990, more than a year before the dissolution of the Soviet Union, Russia (then still called RSFSR – the Russian Soviet Federated Socialist Republic) passed the Land Reform Law and introduced an appropriate constitutional amendment that actually recognized the right of private ownership in agricultural land. As a compromise, however, the amendment imposed a 10-year moratorium on the buying and selling of private land and restricted the alienation of land to the state (and not to other landowners).

This was truly the beginning of the latest revolution in land-tenure relations in Russia. The trail-blazing constitutional amendment was followed by the Russian Law on Peasant Farms (December 1990), which legalized private farming, allowed distribution of collective land in the form of paper shares to members, and provided the option of withdrawing land plots for the establishment of an independent peasant farm outside the collectivist framework. Russia's new Land Code, passed in April 1991, formalized these various legal initiatives and paved the way for the mass privatization of agricultural land.

Land ownership is an emotionally charged issue in Russia. The passage of reform-oriented land laws was accompanied by dramatic political debates, and the sharply opposed positions of the reform-minded executive branch and the highly conservative legislature prevented the development of a full-fledged legal privatization mechanism for more than a decade. The main sticking point was the right to buy and sell privately-owned land – a basic inalienable right associated with private land ownership in market economies. The two branches of government could not agree on this point and the legal deadlock was clearly reflected in the laws of that period. The 1993 Russian constitution simply reiterated the right of private ownership. The 1994 Civil Code suspended its land chapter until the passage of a new land code, while the 2001 Land Code skirted the issue completely by deferring all matters relating to transactions in agricultural land to a special law to be passed at some unspecified time in the future. Thus, all the legal advances since mid-1991 have been realized in the form of presidential decrees and government resolutions – temporary instruments that required ultimate codification in permanent laws, but because of the persistent legislative opposition to the buying and selling of agricultural land, these legal instruments

mainly focused on mechanisms that progressively broadened the range of permissible transactions in land shares, not physical plots. Ownership rights in agricultural land (including buying and selling) were finally normalized in January 2003, when the Law on Agricultural Land Transactions came into force. Mortgaging agricultural land has been allowed since February 2004.

In 1991, agricultural land held by collective and state farms began to be distributed in the form of land shares to individuals, who could then withdraw their land allocation for the establishment of a peasant farm. Alienation of land in peasant farms was allowed only to the state (in practice, to local authorities), not to other individuals. Starting in early 1992, land shares still held in the form of paper certificates could be sold to other members of the collective or to the collective farm as a legal body; physical land plots could be sold only under special circumstances (e.g. when the landowner retired, when the plot was passed as inheritance, when the peasant farmer relocated to another region, or when the seller undertook to use the proceeds from the sale of land for the establishment of a non-farm business). Procedures adopted in March 1993 allowed the buying and selling of land for household plots and other individual uses (dachas, gardening, individual housing).

The new 1993 constitution declared that landowners had "freedom of disposition without violating the rights of other owners". However, the buying and selling of land (other than household plots) was neither allowed nor prohibited. Some regions (e.g. Saratov Oblast) adopted local legislation allowing transactions in land, but no federal law existed. This naturally created serious administrative barriers to the development of land markets, and until the adoption of the January 2003 law, land transactions mainly involved the conversion of land shares into physical plots.

In practice, the legal ban on the buying and selling of agricultural land was bypassed even before January 2003 by presidential decrees and government resolutions. These decrees and resolutions allowed the buying and selling of land shares (first to other members of the collective, and since October 1993 practically to any buyer). Having purchased a land share, the new shareowner could request its conversion into a land plot. The transferability of land shares has led to substantial redistribution of land ownership and land use in former collective farms. Presidential decrees and government resolutions also allowed (since October 1993) conversion of land shares into physical plots for household farming. Once the ownership of the new addition to the household plot was officially registered, it could be sold and bought in accordance with the various rules applicable (since May 1993) to land in household plots. A market has thus emerged for relatively small plots created through conversion of land shares by family members. The national average land share was about 10 hectares, and some regions actually allowed the expansion of household plots to be included in the combined size of the land shares held by all family members. In principle, the size of a

household plot in the fields outside the village limits could thus reach several tens of hectares, which is comparable with the average size of a peasant farm.

Beyond the psychological opposition to the buying and selling of land, other emotional issues included the concern about concentration of land ownership in the hands of few physical persons or corporations ("latifundiazation" of agricultural land), the fear of excessive fragmentation of land during privatization, loss of land holdings by former collective farms due to their weak financial situation and danger of bankruptcy, and that perennial bogey, the sale of Russian land to foreigners. The provisions of the 2003 Law of Agricultural Land Transactions were designed to address these concerns. While the buying and selling of land plots (as well as land shares) was allowed, the state retained a preemptive right on land purchases; regional governments could impose limits on physical concentration of land by a single owner (typically 10 % of the agricultural land in the district), as well as limits on the minimum size of physical plots that could be surveyed and registered for farming purposes (household plots were exempt from this restriction); foreigners and companies with a majority of foreign capital could only lease agricultural land, not own it.

Table 2.2 Assessment of the impact of legal restrictions on transactions in agricultural land

| Legal restriction | Impact assessment |
|--|---|
| Preemptive right of oblast government and municipal authorities to purchase land plots and land shares from joint shared ownership | Intended to prevent socially undesirable transactions, but significantly delays the completion of land transactions and complicates seller-buyer negotiations. Can be bypassed by resorting to alternative mechanisms: Public auction, investment in the equity capital of a corporation, gifts |
| Upper limit on concentration of land by physical persons or legal bodies created by physical persons | Intended to prevent "latifundiazation", but may be overcome by creating a legal body owned by another legal body, not a physical person (e.g. in Belgorod, whole districts are held by a single corporation created by another corporation) |
| Minimum size of agricultural plots | Intended to prevent excessive fragmentation, but some conservative regions abuse this provision by setting unacceptably large minimum sizes, e.g. 100 ha in Voronezh, 200 ha in Krasnodar. |
| Foreigners and foreign corporations not being able to own land | Intended to address social concerns; the restrictive impact of this provision has been alleviated by allowing long-term leasing for 49 years |

The introduction of preemptive rights for the oblast and municipalities is perhaps most restrictive in this context. Negotiations for a piece of agricultural land (or even a land share) between private parties cannot be concluded without offering the authorities the option of buying the land for the same terms. The private deal can go through only if the authorities refuse or let the option lapse (within one month). Moreover, if the terms of sale are changed in the process of negotiations, the authorities again should be given the option to exercise their preemptive right, leading to a further delay of at least one month. Despite these and other reservations, in Russia the legal restrictions on the whole are regarded as striking a reasonable balance between the need to alleviate the original concerns and the goal of minimizing the restrictions on land markets (Table 2.2).

2.3 Land privatization

Contrary to the Baltic states and most countries in East Central Europe, Russia chose to privatize agricultural land by distribution to users, not restitution to former owners. Initial legislation in 1989-91 focused on the principle of private ownership of land and the procedures for distributing state land for individual farming (household plots, small-scale gardeners and vegetable growers, peasant farmers). Mass privatization was launched in 1991-92, when large chunks of state land were privatized into joint ownership of the rural people who lived and worked in collective and state farms. This formal privatization affected most of the agricultural land in collective and state farms, while the rest of the agricultural land and other rural land (including land under farm buildings, for instance) remained state property (creating the so-called redistribution reserve for future municipal and farming needs). The privatized land was then divided into equal shares, and each adult – collective farm worker, pensioner, or employee of rural social services – received one land share. The size of the share was determined by land availability in the district and was rigidly controlled (much like the size of all land distributions to individuals; see Table 2.3).

Table 2.3 Typical size of privatized land units in Russia

| Privatization category | Size |
|--|---|
| Allocation for peasant farming | 30-50 ha |
| Allocation for household plots | 0.5 ha in the village; 1.0 ha in the fields outside the village |
| Allocation for gardening and vegetable growing | 0.06-0.08 ha |
| Allocation for individual housing | 0.10 ha |
| Land share | 7-10 ha |

Source: Authors' estimates based on official statistics.

A land share is a paper entitlement of fractional ownership in the agricultural land transferred by the state to the collective. This mechanism created a new ownership category that became known as "joint shared ownership". This was

no longer state ownership (hence the use of the term "privatization"), but it was not individual ownership either. The reform laws typically allowed shareowners to withdraw physical land plots from joint shared ownership into individual ownership, but the requirement to survey and register the plot (with all the attendant costs and administrative complications) was deferred to that time in the future when the shareowner would actually decide to withdraw his or her land from the common pool of owners.

Russian land privatization quickly produced 11.9 million shareowners, with land shares covering 117.6 million hectares, or 9.9 hectares per share. By 1995 the state had privatized through land shares fully 56 % of the original 209.8 million hectares controlled by former collective and state farms at the beginning of reform. The remaining land was transferred to the state redistribution reserve, which provided the pool of land for the future creation of peasant farms, expansion of household plots, and various municipal needs.

The distribution of land shares created, for the shareowners, a difficult decision: They could choose to start an independent business by withdrawing their land from the collective; or they could simply leave their land shares in joint cultivation with the existing collective farm (which meanwhile had reorganized as a corporate farm in one of the standard organizational forms, such as a shareholding company, limited liability company, partnership, or agricultural cooperative). It was clear from the outset that most shareowners would not establish an independent farm and instead would prefer to keep their land shares in the collective. It bears mention that in 1992 half the shareowners were elderly pensioners. With time, the rural population developed mixed conversion strategies, with several members of the same family or groups of relatives and neighbors pooling their paper shares to receive one contiguous land plot in return. One of the villages in Leningrad Oblast provides a typical example of such "home-made consolidation": Six families jointly holding 17 land shares were allotted 6 consolidated plots, with each family receiving a single plot of appropriate size, regardless of whether its individual members had 2, 3, or 5 land shares. This share consolidation strategy is a natural response to concerns about the excessive fragmentation of individual land plots. In retrospect, distribution of land shares has proved more effective and less costly for land consolidation than the distribution of physical plots would have. This is evident from any comparison with the experience in East Central Europe, where land fragmentation and consolidation efforts are still a major issue after nearly fifteen years of transition.

The privatization process itself provided the trigger for the first land market transactions in Russia. The former collective and state farms, now reorganized as corporate farms of various types, were formally left without any land for farming. They had to turn to the newly-created shareowners and lease their land shares or, alternatively, entice them into investing their land shares in the equity

capital of the corporate farms. Initially, it was not too difficult to persuade the new shareowners not to withdraw their land and to let the corporate farm continue using it. However, as time went on and people began to get used to the new market mechanisms, some shareowners would withdraw their land from the former collective farm and lease it to another producer who was offering more competitive terms. A shareowner could actually avoid the bureaucratic hassle of withdrawing a land plot and simply lease out the land share. The lessor would then negotiate for a specific plot with the manager of the collective farm where the share was originally used. A two-tier leasing system thus developed: Leasing land shares from individual shareowners (either by the original corporate farm or by other producers) and leasing land plots from individuals who have independently converted their land share into a plot. All in all, it seems that the Russian land privatization strategy, based on the distribution of land shares instead of the more conventional (to the Western observer) distribution of individual land plots, has had clear beneficial effects on the level of transaction costs, although it possibly delayed the productivity improvements normally associated with individual ownership and control of land.

The 2003 Law on Agricultural Land Transactions has interfered with this established process by prohibiting the leasing of land shares and requiring that a land share be converted into a physical plot before it could be leased. All the existing lease transactions involving millions of land shares have thus been placed in a legally dubious position. According to the strict letter of the law, the existing lease agreements have to be rewritten for specific land plots or, failing that, the land shares have to be placed in a fiduciary trust. The trust manager would then supervise the distribution of revenues between the farmer-operator and the landowner. The option of converting land shares into plots is not simple to implement because of the substantial costs and bureaucratic complications (see Section 4), whereas the option of putting the leased land in trust is totally alien to the peasant mentality (not only in Russia, but anywhere in the world) and moreover suffers from various legal inconsistencies with the provisions of trust management in the Civil Code. Nevertheless, the new provision of the 2003 Law on Agricultural Land Transactions has definitely spurred interest in surveying, registering, and titling individual land plots, and has unintentionally led to further cost increases as the demand for surveyor services outstripped the limited availability of these professionals.

In addition to transactions in private land, there are, naturally, transactions involving state-owned land. The original distribution of state land to peasant farmers and households (up to specific limits) was free. After that, state land had to be leased or purchased. Both types of transactions for state land legally require an auction, or at least a bidding process, but in many cases, in practice, this requirement is bypassed.

2.4 Land ownership structure

The structure of agricultural land ownership produced by privatization is presented in Table 2.4. The share of state-owned agricultural land dropped from 100 % before 1990 to around 40 % today. Nearly 60 % of agricultural land is now privately owned, but most of this land (51 %) is represented by land shares – abstract (though transferable) pieces of paper corresponding to virtual plots. Only 6 % of agricultural land is in the form of physically demarcated plots, most of it owned by individuals (household plots and peasant farms).

Table 2.4 Agricultural land ownership, 2003

| | Million ha | Percent |
|---------------------------------|------------|---------|
| Total agricultural land | 220.9 | 100 |
| Privately owned (as reported) | 127.5 | 58 |
| Individuals: Land shares | 112.7 | 51 |
| Individuals: Plots ¹ | 12.1 | 5 |
| Corporations ¹ | 2.7 | 1 |
| State owned (by difference) | 93.4 | 42 |

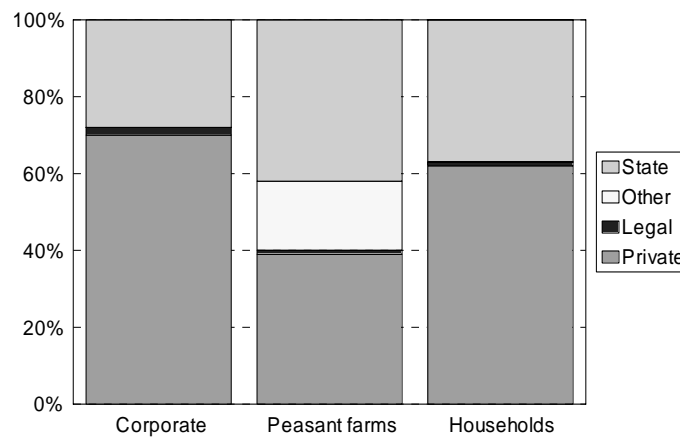
Source: Total agricultural land from GOSKOMSTAT (2003a); Breakdown by ownership from ROSZEMKADASTR (2002a), pp. 49, 57, 100, 109; and ROSZEMKADASTR (2004), pp. 13, 253, 604, 616.

Note: ¹ About 2.5 million hectares held in peasant farms registered as legal bodies have been moved from the category of corporations (where it is formally reported) to the category of individual plots.

Examining the structure of land ownership via three main categories of users (corporate farms, peasant farms, and household plots), we see an astonishing similarity between corporate farms and household plots (Figure 2.2). For both types, about 30 % of the land is state-owned, and close to 70 % is land owned by private individuals; land in corporate private ownership (leased from other corporate farms or invested by shareowners in the equity capital) accounts for a negligible 1 %-2 %. However, there is a huge difference in the kind of individual land ownership between corporate farms and household plots: Virtually all individually owned land in corporate farms is in the form of land shares owned by the local rural population, while in household plots this is physically demarcated private land. Peasant farms have a smaller component of individually owned private land (about 40 %, all of it in the form of physical plots) and they rely to a greater extent on land leased from the state and on land shares leased from outside owners who are not family members. This component of land leased in the form of shares from outsiders accounts for 18 % of total holdings in peasant farms (shown as "other" in Figure 2.2).

Some of the state land in individual farms is still reported in the old tenure forms (usage rights or possession). This applies to two-thirds of the state land in household plots and one-third in peasant farms. Eventually this land will be transferred to the private ownership of the users, increasing the component of

Fig. 2.2. Structure of land ownership by farm type 2001
(in percent of agricultural land)



individually owned land by as much as 25 % in household plots and 15 % in peasant farms.

Since 88 % of privately owned land is represented by land shares (Table 2.4), it may be instructive to look at the disposition of land shares in corporate farms. According to Roszemkadastr data for 2004, 64 % of the land shares are leased by corporate farms from individuals and 12 % are given to corporate farms in use rights. The remaining 24 % is represented by unclaimed land shares of beneficiaries who have died, left the village, or failed to exercise their right for other reasons (e.g. did not want to pay for the share certificate). The local corporate farm continues to use the unclaimed land shares by default.

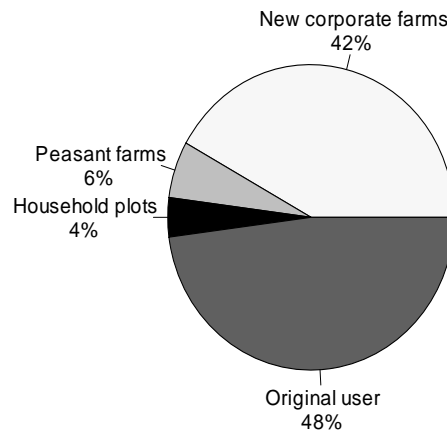
2.5 Land redistribution in the process of reorganizing former collective farms

The basic land privatization mechanism – distribution of land shares accompanied by the option of individual or group withdrawal with land – has created the basis for redistribution of agricultural land among users. Although in reality this option has seldom been exercised among the 12 million shareholders, it exists and in some specific instances has led to the significant redistribution of privatized land resources.

One of the examples of significant land redistribution is provided by the Lodeinopl'skii Raion in Leningrad Oblast. In the pre-reform period, the farms in this district specialized in dairy production, largely relying on concentrated feed supplied by the state at subsidized prices. After 1991, when state support to livestock production was curtailed, farms did not have machinery to produce feed grain and had to reduce their dairy herd to one-third of the pre-reform level. The performance of all corporate farms in the district deteriorated and signs of impending bankruptcy began to appear. The local financial crisis provided a stimulus

for a spate of reorganizations, which included the creation of new corporate farms, as well as the expansion of peasant farms and household plots.

Fig. 2.3. Farm reorganization by transfer of land shares



Lodeinopol'skii Raion, 2002-2003, percent of land shares

The process did not involve any buying and selling of land and was enabled by a flow of land shares from owners to new users. Among the six former collective farms in the district, more than 50 % of land resources were redistributed by land share transfers (Figure 2.3). Most of the land was absorbed by new corporate farms (primarily through leasing), but about 10 % of the land shares were taken up by peasant farms and household plots with the purpose of expanding their holdings. The remaining 48 % of the land shares did not find new users, in part because the shareowners had died or left without assigning their usage rights (about 20 % of the shares). By default, these shares continue to be used by the (greatly downsized) former collectives.

This example, with half the land shares transferred to new users and the other half remaining, by default, with the original user – a former collective farm – is typical of agriculturally poor regions, where the demand for land is weak. In agriculturally fertile regions land is in greater demand and the process of redistribution proceeds differently. Thus, in Belgorod and Orel oblasts in the highly productive central region, the oblast authorities are actively trying to attract new investors to agriculture. The investors prefer not to acquire the failing, debt-ridden former collectives and instead create entirely new corporate farms by leasing or buying land shares and sometimes even persuading the shareowners to put their land in the corporate farm's equity capital. The former collective farms remain as empty shells and carry the responsibility for most of the outstanding debt, which will eventually be liquidated through bankruptcy proceedings.

3 EMERGENCE OF LAND MARKETS

Land market transactions are divided into two main categories: Buy-and-sell transactions that involve the transfer of legal ownership; and leasing transactions that involve the transfer of use rights from owner to tenant without change of ownership. The existing registration procedures ensure a fairly complete record of transactions in state land (both leasing and buying), but they do not capture any leasing transactions between individuals – whether plots or land shares. The buying and selling of land plots between private individuals and corporations is in principle covered by the statistics, but only to the extent that the buyers and sellers choose to go through the bureaucratic difficulties of registering the transaction (see Section 4). The general trend of all registered transactions (including both agricultural and non-agricultural land) is shown in Table 3.1, and Table 3.2 estimates the transactions in agricultural land (which constituted one-third of the total number of 5.6 million transactions in 2001).

Table 3.1 Registered land transactions 1997-2002: National statistics

| | Number of transactions, millions | Land area involved, million ha | Percent of transactions | | |
|------|----------------------------------|--------------------------------|---------------------------------|--|------------------------------|
| | | | Leasing of state/municipal land | Buy-sell by individuals and corporations | Other types of transactions* |
| 1997 | 4.0 | 23.5 | 88 | 7 | 5 |
| 1998 | 4.4 | 24.6 | 91 | 5 | 4 |
| 1999 | 5.2 | 72.2 | 91 | 6 | 3 |
| 2000 | 5.3 | 60.3 | 90 | 6 | 4 |
| 2001 | 5.6 | 70.0 | 90 | 6 | 4 |
| 2002 | 5.3 | 43.9 | 89 | 6 | 5 |

Source: 1997-99 from GOSKOMZEM (private communication); 2000-2001 from ROSZEMKADASTR (2002b), p. 19; 2002 from ROSZEMKADASTR (2003a), p. 104.

Note: * Sale of state and municipal land, sale of lease rights in state and municipal land, inheritance, mortgage, gifts.

Table 3.2 Transactions in agricultural land 2001: National statistics

| | Number of transactions, '000 | Percent |
|---|------------------------------|---------|
| Leasing of state land to households | 1,695.6 | 93.0 |
| Leasing of state land to agricultural producers | 81.4 | 4.5 |
| Sale of state land to households | 2.6 | 0.1 |
| Sale of private land to households | 44.5 | 2.4 |
| Total transactions in agricultural land | 1,824.1 | 100.0 |

Source: Estimated from ROSZEMKADASTR (2002b), pp. 46, 52, 78, 84, 111, 113, 115. Data for later years not available.

The buying and selling of agricultural land by individuals is miniscule compared to land leasing from the state and shareowners. Statistics record 150,000 transactions annually between private landowners in villages (primarily owners of

household and garden plots), and the amount of land transacted is about 0.5 % of their total holdings. Table 3.3 presents the available data in the form of three-year averages (1997-99 and 2000-02). The number of transactions shows a definite increase over time, while the transacted land area remains constant. As a result, there is a slight decrease in the average transaction size, which is more noticeable for household plots (0.24 ha in 1997-99 compared with 0.21 ha in 2000-02). Furthermore, the number of land transactions for garden plots is an order of magnitude greater than the number of transactions for household plots, but the average transaction size is an order of magnitude smaller.

Table 3.3 Sale of privately owned rural land for household plots and garden plots

| | Number of transactions | | Area, ha | | Average plot size, ha | |
|--------------------|------------------------|--------------|-----------------|--------------|-----------------------|--------------|
| | Household plots | Garden plots | Household plots | Garden plots | Household plots | Garden plots |
| Total transactions | 92,385 | 45,101 | 22,005 | 3,580 | 0.24 | 0.08 |
| 1997-99 | | | | | | |
| 2000-02 | 107,854 | 50,295 | 22,222 | 3,778 | 0.21 | 0.08 |
| Total holdings | | | 6,480,000 | 1,260,000 | | |
| 2000-02 | | | | | | |

Note: Calculations based on yearly data from the following sources: 1997-99 from GOSKOMZEM (2000), p. 24; 2000-01 from ROSZEMKADASTR (2002b), p. 31; 2002 from ROSZEMKADASTR (2003a), p. 115. Total holdings from GOSKOMSTAT (2003a), p. 399.

Land transactions and land market constraints cannot be studied using only official sources because no statistical data are available on transactions in agricultural land and land shares and there is absolutely no information on the terms of land transactions, the composition of buyers and sellers, or supply and demand. At the present stage, the required data can be obtained only through specially designed questionnaire-based surveys. We carried out such surveys in three regions – Rostov, Ivanovo, and Nizhnii Novgorod – which differed in natural conditions, economic development, and level of policy reforms. The surveys covered agricultural producers of three basic organizational forms – farm enterprises (a corporate form of organization), peasant farms, and household plots (of two individual forms of organization).⁵ The discussion in the following subsections is based on the survey results.

⁵ For a detailed discussion of these organizational forms, see UZUN (2005). One of the significant behavioral differences between peasant farms and household plots was eliminated from the survey by restricting the sample to household plots with declared commercial orientation.

3.1 Land market activity

The survey shows that only household plots rely mainly on owned land, while leasing is widespread among both corporate and peasant farms (Table 2.4). In corporate and peasant farms, the share of leased land is, on average, 60 % of the total area of agricultural land used. In corporate farms, three-quarters of the leased land is in the form of land shares, and only one-quarter is leased as land plots. Peasant farms, on the other hand, tend to lease land plots to a greater extent (more than 40 % of all leased land). The owned land in peasant farms consists of land shares and land plots allotted, without payment, to the members of the farm during land privatization (land in joint shared ownership), as well as land shares and land plots purchased on the market. The owned land of corporate farms consists of land shares invested by members in corporate equity capital. The share of owned land in corporate farms (36 % in Table 3.4) is overestimated in part due to the incorrect interpretation of survey questions by the managers, who improperly regard leased land shares as land shares invested in their corporate farm's equity. According to official national statistics, the share of owned land in corporate farms is only 1.3 % (see ROSZEMKADASTR (2003b), p. 13).

Table 3.4 Sources of land in the survey (percent of the total area)

| | Corporate farms (n=136) | Peasant farms (n=222) | Household plots (n=190) |
|--------------------------------|-------------------------|-----------------------|-------------------------|
| Average farm size | 4,100 ha | 270 ha | 2.6 ha |
| Leased land | 61 | 57 | 3 |
| Leased land shares | (46) | (32) | -- |
| Leased land plots | (15) | (25) | -- |
| Owned land | 36 | 42 | 93 |
| Purchased land shares | (2) | (30) | -- |
| Purchased land plots | (1) | (11) | -- |
| Land shares invested in equity | (33) | (1) | -- |
| Other | 3 | 1 | 4 |
| Total | 100 | 100 | 100 |

Source: 2003 BASIS survey.

Note: * The numbers in parentheses are rough estimates based on a portion of the respondents.

Respondents from 553 farms of various organizational forms in three regions reported 97 land transactions during one year. The frequency of transactions was virtually the same in farms of different organizational forms. There was only one case of selling land. All other transactions involved land leasing. Strengthening the data in Table 3.4, this shows that land leasing is the dominant form of transaction in land markets across Russia, and yet most of these transactions remain outside the scope of official statistics.

The survey did not detect any dependence of land transaction frequency on the distance from the regional center in any of the three oblasts studied. Yet we are witnessing a particularly active land market in areas close to Moscow and in Moscow Oblast, where land is bought for non-agricultural purposes. This subject requires further study.

3.2 Reported land transactions

The incidence of land transactions in the sample is not very pronounced and basically only leasing transactions are reported. A total of 96 respondents (17 % of the sample) report engaging in land lease transactions of some kind in 2001. Of these, 57 respondents (10 %) report that they lease in additional land, 34 respondents (6 %) report that they lease out land, and 4 respondents (1 %) report both leasing in and leasing out of land.

Leasing in

A total of 61 respondents (11 % of the sample) reported acquiring additional land by leasing in 2001. The distribution of transaction frequency across the three organizational forms did not significantly vary from the uniform (see gray bars in Figure 3.1). The transactions included 56 instances involving the leasing of physical plots and 13 instances involving the leasing of land shares (land shares can be leased from private individuals only).

Table 3.5 Lease-in transactions and prices by source of land (including leasing of plots and land shares)

| Source | Number of transactions | Ha – mean | Ha – median | Number of price data | Price/h a mean | Price/h a median |
|--|------------------------|-----------|-------------|----------------------|----------------|------------------|
| Plots: | | | | | | |
| Corporate farms | 22 | 112 | 5 | 17 | 480 | 324 |
| Private individuals | 18 | 298 | 29 | 13 | 576 | 362 |
| District administration | 10 | 163 | 142 | 8 | 42* | 48 |
| Other | 6 | 1,102 | 425 | 2 | 100-143 | |
| Total plots | 56 | 287 | 28 | 40 | 405 | 212 |
| Plots from corporate farms and private individuals | | | | | | |
| | 40 | 196 | 16 | 30 | 522 | 343 |
| Land shares from private individuals | 13 | 1,198 | 524 | 13 | 607 | 420 |

Source: 2003 BASIS survey.

Table 3.5 shows the distribution of transactions by main sources of land and the estimated prices per hectare, per year (mean and median). The prices reported for land leased from the district administration (40-50 rubles per hectare) were significantly lower than the prices paid to corporate farms and private individuals (400-500 rubles per hectare). There were no statistically significant differences in

prices paid to private individuals for land leased in the form of plots or paper shares. This issue requires further study in a larger sample, as one would normally expect surveyed plots to fetch a higher price than land shares, which involve additional transaction costs before conversion into physical land ready for cultivation (see also Section 4).

The average amount of land, per farm, acquired through land shares is significantly greater than the amount of land acquired by leasing physical plots. On the other hand, there are no statistically significant differences in the size of physical plots leased from different sources. The median plot areas in Table 3.5 seem to suggest that the smallest areas are acquired from corporate farms and the largest from the district administration and other sources. However, these differences are not statistically significant. In general, the amount of new land acquired in 2001 is strongly correlated with total land holdings of the acquiring farms ($R=0.94$ between logged variables). The correlation with land holdings remains statistically significant even when we control for organizational form (corporate farms, peasant farms, household plots), which in itself accounts for a lot of variability in land transactions ($R^2=0.83$).

Table 3.6 Distribution of farms of different organizational forms, by sources of land

| | Corporate farms (n=23) | Peasant farms (n=24) | Household plots (n=22) |
|-------------------------|---------------------------|-------------------------|---------------------------|
| Corporate farms | 22 | 21 | 55 |
| Private individuals | 22 | 21 | 36 |
| - Plots | | | |
| - Land shares | 26 | 29 | 0 |
| District administration | 17 | 21 | 5 |
| Other | 13 | 8 | 4 |
| Total | 100 | 100 | 100 |

Source: 2003 BASIS survey.

There are no significant differences in access to different sources of land for corporate farms and peasant farms (Table 3.6). Unlike corporate and peasant farms, household plots do not lease land shares: They only lease land plots – mainly from corporate farms and, to a certain extent, also from private individuals. Their transactions with the district administration are minimal. This is also in contrast to corporate and peasant farms, for which more than 25 % of lease transactions are with the district administration. These differences in the pattern of leasing sources, and specifically the preference of household plots for leasing land from corporate farms, may explain the observation in Table 3.5, according to which the smallest plots are acquired from corporate farms.

Leasing out

In addition to 61 respondents who lease in land, 38 respondents (7 % of the sample) report leasing out land and one respondent reports the sale of land. It is mostly corporate farms that lease out land (the one seller is also a corporate farm), presumably due to lack of profitability and inadequate business opportunities. At the other extreme, very few peasant farms lease out land – for exactly the same reasons, but in reverse (see black bars in Figure 3.1). Household plots fall in between, with 9 % leasing out land. A working hypothesis suggests that these are probably plots owned by older families, although a lack of household demographic data in the survey instruments makes it impossible to check this hypothesis. The survey only reveals that farms lease out land predominantly because they are unable to cultivate it themselves. This is the reason provided by 32 out of 38 lessor farms. Yet these responses are equally distributed among corporate farms and household plots and we cannot learn anything about the specific reasons for leasing out land by household plots. Note that, contrary to the distribution of lessors (black bars in Figure 3.1) the lessees are fairly uniformly distributed across farm types (gray bars in Figure 3.1).

The average size and the average price received in leasing-out transactions are given in Table 3.7 (means and medians in the sample). The general pattern is essentially the same as for leasing-in transactions (see Table 3.5), except that district administration is not included. Household plot operators lease out land exclusively to the local corporate farm. Corporate and peasant farms lease out land to other corporate farms and private individuals in roughly equal proportions (in such a small sample, percentage frequencies are meaningless). In this sense, the leasing-out and leasing-in patterns are identical.

Fig. 3.1. Leasing transactions by farm type

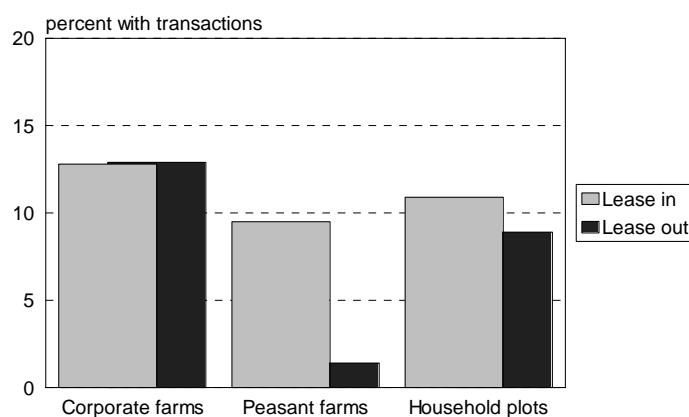


Table 3.7 Lease-out transactions and prices by source of land

| Source | Number of transactions | Ha – mean | Ha – median | Number of price data | Price/ha mean | Price/ha median |
|---|------------------------|-----------|-------------|----------------------|---------------|-----------------|
| Corporate farms | 29 | 163 | 13 | 15 | 467 | 350 |
| Private individuals | 10 | 262 | 139 | 8 | 361 | 238 |
| Other | 2 | 100-191 | | 2 | 24-158 | |
| Total | 41 | 186 | 28 | 25 | 403 | 310 |
| Corporate farms and private individuals | 39 | 188 | 18 | 23 | 430 | 325 |

Source: 2003 BASIS survey.

Larger farms (i.e., corporate farms) clearly lease out more land than smaller farms (i.e., household plots). This association between farm size and the amount of land leased out is demonstrated in Table 3.8. Yet, the large corporate farms lease out but a small fraction of their holdings, while the small individual farms, once they decide to lease out land, release most of their initial holdings and are sometimes left with less than the amount leased out to other users. Of the 21 small farms that act as lessors, 14 farms leased out about half their initial holdings while the remaining seven farms leased out 94 % of their initial holdings. These "superaggressive" lessors cultivate, on average, a small residual of 0.7 hectares after leasing out more than 10 hectares.

Table 3.8 Amount of land leased out and farm size

| | Number of lessor farms | Average farm size, ha | Average leased out, ha |
|---------------------------|------------------------|-----------------------|------------------------|
| Corporate farms | 16 | 7,400 | 463 |
| Plots and peasant farms | 21 | 8.6 | 11.4 |
| "Aggressive" lessors | 14 | 12.5 | 11.9 |
| "Superaggressive" lessors | 7 | 0.7 | 10.3 |

Source: 2003 BASIS survey.

3.3 Payment for land

Prices of leased-in and leased-out land were compared for transactions involving corporate farms and private individuals as lessees and lessors (see last line in Tables 3.5 and 3.7, respectively). The differences in prices are not statistically significant. The median price in the sample for all leasing transactions in these channels is 330-340 rubles per hectare. Supplementary data were obtained by analyzing the lease payments for land shares (median 420 rubles) and separate partial responses of lessees and lessors regarding structure of lease payments (which give 450 rubles/ha for leasing in and 440 rubles/ha for leasing out; the difference is not statistically significant). The various numbers suggest median

lease payments of 350-450 rubles per hectare in the sample (excluding transactions with the district administration, which command much lower prices).

Table 3.9 Lease payments estimated from the survey

| Types of lease payments | Lessees, % | Structure of payments for leased in land, % | Lessors, % | Structure of payments for leased out land, % |
|-------------------------|----------------|---|----------------|--|
| Land tax | 45 | 2 | 13 | 1 |
| Fixed, in cash | 25 | 20 | 22 | 17 |
| Fixed, in-kind | 52 | 57 | 17 | 22 |
| Share of output | 9 | 18 | 43 | 59 |
| In services | 9 | 3 | 13 | 1 |
| Total | * | 100 | * | 100 |
| | 56 respondents | 451 rubles/ha | 23 respondents | 441 rubles/ha |

Source: 2003 BASIS survey.

Note: * Adds up to more than 100 % because multiple answers were allowed.

Most lessees made lease payments in-kind; payment in cash was less common. Many lessees assumed responsibility for the land tax. Lessors also indicated that lease payments were typically a share of the output. The mean lease payment was 440-450 rubles/ha (Table 3.9). Lease payments estimated separately for land shares exhibited a median of 420 rubles/ha, while the median of all leasing transactions in the survey was 340 rubles/ha. Thus, the lease payments range between 350-450 rubles/ha, excluding the transactions in state land. The lease payments to the district administration for state land are much lower (about 50 rubles/ha, see Table 3.5). The differences in lease payments across farms of different organizational forms are not statistically significant.

Leasing is often for medium- or long term. About 50 % of both lessees and lessors report leasing terms longer than 4 years (and in some cases longer than 10 years).

3.4 Potential for land transactions

The potential for land transactions was examined by exploring farms' perceived need for additional land (Table 3.10). Nearly 30 % of respondents desired increased landholdings. This potential for future land transactions should be compared with the actual frequency of land leasing in 2001, which covered 11 % of respondents (uniformly distributed over the three organizational forms). The greatest need for additional land is expressed by peasant farmers: 50 % of respondents in this category desire more land, compared with less than 20 % among household plots and corporate farms. Peasant farmers who would like to increase their holdings typically have less land than the rest, although the difference is not dramatic (225 hectares compared to 314 hectares for those who do not need more land). A similar situation is observed for corporate farms (3,350 hectares

compared with 4,320 hectares). Among household plot operators, on the other hand, the difference in land holdings between those who say they need more land and the rest is not significant.

Table 3.10 Potential and actual land transactions (percent of respondents)

| | Potential: Desire additional land | Actual: Acquired additional land in 2001 |
|-----------------|-----------------------------------|--|
| Whole sample | 29 | 11 |
| Corporate farms | 18 | 13 |
| Farms | 49 | 9 |
| Plots | 13 | 11 |

Source: 2003 BASIS survey.

In principle, we can expect the demand for land to depend on a farm's financial situation. However, the only indicators of financial performance in the survey were sales revenue and surplus – a very crude profit-like measure of financial sources in excess of uses. Neither of these financial indicators showed a clear association with the perceived demand for land.

The most common option for acquiring additional land is by leasing a plot from a private individual (40 % of respondents with a perceived need for additional land). Other accessible options (in multiple-choice answers) include obtaining a plot from the state in leasehold or use rights (35 %), buying land shares (18 %), and even buying a land plot from a private individual (17 %). There are clear differences in potential access patterns of different organizational forms to various sources of land (Table 3.11). While corporate farms and peasant farms envisage mainly leasing from private individuals and the state, household plots primarily intend leasing from corporate farms or buying from individuals. Buying land shares is considered a viable option only by peasant farms.

Table 3.11 Perceived sources for acquiring additional land (percent of respondents)*

| | All re-spondents (n=161) | Corporate farms (n=25) | Peasant farms (n=111) | Household plots (n=25) |
|------------------------------|--------------------------|------------------------|-----------------------|------------------------|
| Leasing plot from individual | 44 | 32 | 52 | 16 |
| Leasing from the state | 35 | 28 | 40 | 20 |
| Buying land shares | 18 | 8 | 23 | 4 |
| Buying plot from individual | 17 | 0 | 19 | 24 |
| Leasing from corporate farm | 16 | 28 | 9 | 32 |

Source: 2003 BASIS survey.

Note: * Percentages in each column add up to more than 100 % because multiple answers were allowed; "lease" also includes taking land in use rights.

Buying land is thus not perceived as an impossibility in the current environment. Indeed, fully 30 % of respondents indicate that they would be able to get additional land in private ownership as needed (Table 3.12). However, leasing is

clearly perceived as the most accessible option, with more than 60 % indicating that they would be able to lease additional land as needed.

**Table 3.12 How can you acquire additional land if needed?
(percent of respondents)**

| | Acquire in private ownership | Lease |
|-----------|---------------------------------|-------|
| Yes | 31 | 61 |
| Undecided | 48 | 34 |
| No | 20 | 5 |

Source: 2003 BASIS survey.

As there are no observations of buy-and-sell transactions in the survey, it is unfortunately impossible to analyze the role of access to credit and other farm-related factors as potential constraints in land market development. Still, it is encouraging to note the emergence of land leasing transactions as a first stage and the positive perception of the buying and selling of land as the second stage of land market development in the future.

3.5 Estimating the demand for agricultural land

The holdings of existing agricultural producers, including the leased component, formed a long time ago, thus the observed situation does not necessarily reflect a true satisfied demand for land. The survey has shown that the demand for land and thus the potential for land transactions vary by region and by type of farm.

In all three regions surveyed, peasant farms revealed a greater demand for land than corporate farms. Thus, 30 %-70 % of peasant farmers indicated a demand for land (Table 3.13). Among corporate farms, on the other hand, the maximum demand for land (30 % of respondents) was reported in Rostov (a region with highly developed agriculture), whereas in the less developed Ivanovo and Nizhnii Novgorod oblasts, corporate farms showed a much lower demand for land.

**Table 3.13 Land users' intentions to reduce or enlarge their land
(percent of responses)**

| Region | Farm type | Reduce | Enlarge | Total ag. land, ha |
|---------------------|-----------------|--------|---------|-----------------------|
| Ivanovo | Corporate farms | 43 | 3 | 98,000 |
| | Peasant farms | 10 | 20 | 420 |
| | Household plots | 1 | 14 | 80 |
| Nizhnii Novgorod | Corporate farms | 26 | 11 | 99,000 |
| | Peasant farms | 0 | 67 | 460 |
| | Household plots | 7 | 12 | 141 |
| Rostov | Corporate farms | 3 | 1 | 271,000 |
| | Peasant farms | 30 | 50 | 57,000 |

Source: 2003 BASIS survey.

In Ivanovo (an example of an agriculturally depressed region), 43 % of corporate farms plan on reducing the use of land and only 3 % plan on enlarging it (Table 3.13). A similar trend is observed in Nizhnii Novgorod (an example of a region with medium agricultural development). This suggests that corporate farms in agriculturally less developed regions will probably shed some of their land when they begin re-registering their use rights in state land and lease contracts for land shares, as mandated by the new law. Some of the released land will be absorbed by peasant farmers, who in general seek to enlarge their holdings, but the growth potential of this segment is not particularly large: While corporate farms control tens of thousands of hectares in each oblast, all peasant farms combined have less than 1,000 hectares in Ivanovo and Nizhnii Novgorod. Due to the absence of other interested parties, much of the land released by corporate farms may remain unused. The opposite situation will probably occur in Rostov, with its highly developed agriculture and different specialization (more crops, less livestock). There will be no unused agricultural land in this oblast (Table 3.13) and unsatisfied demand for land can actually arise.

To conclude, we see that there is a demand for land for large-scale agricultural production in some regions (the Rostov example). In all regions, however, peasant farmers and household-plot owners show less intention of reducing their holdings and more willingness to enlarge their land than managers of large corporate farms. This tendency does not depend on natural and climatic conditions. In all three regions surveyed, peasant farmers demonstrate a greater demand for land, even more than household-plot operators. Nevertheless, the physical potential of peasant farms and household plots in Ivanovo, Nizhnii Novgorod, and similar less developed regions is not sufficient to absorb the surplus land that will be released by corporate farms.

3.6 Factors determining land transactions

We have attempted to use Rozsemkadastr regional data to model land transactions in a cross-section of Russia's 71 regions (omitting those where private land ownership is prohibited and where data are suspect). The registered transactions are a mixture of different types, but the main category includes transactions that involve leasing state land outside the village limits by corporate and peasant farms. Household plots are not included in this category since they generally lease land from municipalities inside the village limits.

Our modeling exercise was subject to severe restrictions imposed by the availability of regional data. We have tried a model in which the total number of leasing transactions is explained by the following independent variables:

- The number of potential lessees, i.e., the number of corporate and peasant farms in the region. The expectation is that a higher number of potential lessees will have a positive impact on land leasing transactions. To allow

for the possibility of differential effects of farms from the two categories, the number of corporate farms and the number of peasant farms were introduced separately.

- The quality of agricultural land: The expectation being that better land will increase the scope of leasing transactions. Land quality was represented by two alternative measures: The so-called "cadastral price", which is a value calculated based on local land fertility (Model 1), and partial productivity of land calculated as regional agricultural product per hectare of agricultural land (Model 2).
- Availability of agricultural land in the region: More agricultural land should lead to more leasing transactions.

Other a priori relevant factors, such as the financial situation of farms (farms that are better off would tend to engage more in leasing transactions), could not be used for lack of data.

The regression results are presented in Table 3.14, which also gives the mean values of the variables across 71 regions. On the supply side, both availability of agricultural land and land quality have a significant positive effect on the number of lease transactions. On the demand side, the number of peasant farms has a positive effect on the number of transactions, while the effect of the number of corporate farms is not statistically significant. This result is understandable because peasant farms exist in much larger numbers (nearly 3,500 peasant farms in the average region) and accordingly engage in more numerous transactions. The few hundred corporate farms in each region (350 on average) cannot produce a noticeable impact on the total number of transactions.

Table 3.14 Regression modeling of land lease transactions in a cross-section of 71 regions (2001)

| | Model 1 | | Model 2 | | Mean value |
|--|-------------|-----------------|-------------|-----------------|------------|
| | Coefficient | <i>p</i> -level | Coefficient | <i>p</i> -level | |
| Dependent variable: Number of transactions | | | | | 1,131 |
| Number of corporate farms | -1.35 | 0.214 | 0.25 | 0.827 | 347 |
| Number of peasant farms | 0.11 | 0.032 | 0.21 | 0.000 | 3,374 |
| Agricultural land in farms, '000 ha | 0.48 | 0.001 | 0.33 | 0.031 | 2,081 |
| Cadastral price, ruble/ha | 0.13 | 0.000 | -- | -- | 10,950 |
| Land productivity, ruble/ha | -- | -- | 0.07 | 0.080 | 7,360 |
| R^2 | 0.545 | | 0.42 | | |

Source: Transactions from ROSZEMKADASTR (2002b), pp. 46-47; Agricultural land in farms from ROSZEMKADASTR (2002a), pp. 113-129, 199; Number of farms and productivity from GOSKOMSTAT (2001).

Land transactions are naturally driven by additional factors that could not be formalized for analysis due to a lack of data. We will briefly consider three

groups of factors that seem to be conducive to the development of land transactions in rural areas. These factors include the general poverty of the rural population, which often drives families to sell their property for cash; the inability of current land users to pay competitive rates, which encourages rural landowners to look for new clients for their land; and the emergence of cash-rich non-agricultural companies looking for new investment opportunities in agriculture.

Rural poverty

Agricultural land is mainly owned by the rural population, i.e., workers and pensioners of farm enterprises created by the reorganization of kolkhozes and sovkhozes. This is a low-income segment of the Russian population. The agricultural wages remain very low (40 % of the national average) and every third worker in agriculture suffers from salary arrears (compared with every eighth worker in the manufacturing industries). In April 2002, 51 % of agricultural workers earned less than 1,000 rubles per month and about 40 % earned less than 800 rubles per month. The per capita income of rural households was 1,971 rubles, exceeding the minimum cost of living by only 4 % (GOSKOMSTAT, 2003b). If anybody were to suggest that these workers sell their land shares, they would sell them. For comparison, the minimum price of land (in the form of land shares, before conversion into plots) in Moscow Oblast is 10,000 rubles per hectare, and the average land share is 3-4 hectares. These people would gladly sell their land if anyone were willing to buy it.

The practice shows that when willing buyers turn up in a village, only 15 % of land-share owners refuse to sell. The buyers offer cash on the table, and the price is comparable with wages or pensions that rural people receive over 1-3 years. Land shares have become a commodity in impoverished areas, which was not the case during the initial stages of land privatization. Thus, from the beginning of land privatization to 2003, heirs never bothered to register the rights to their inherited land, because registration would only lead to a real estate tax without any increase of income. According to calculations for four farm enterprises in Moscow Oblast, the dead "owned" nearly 30 % of land shares as of the beginning of 2004. When the demand for land shares materialized, most of the heirs began to register their rights to the inherited land.

Uncompetitiveness of traditional agricultural producers in the land market

To compete against those who buy land for non-agricultural purposes, lease payments from farm enterprises and peasant farmers should at least be equal to the bank interest rate on the market value of a land share, i.e., on average, 1,000 rubles/ha. Agricultural producers cannot afford such payments (as shown previously, the actual lease payments in the survey are 300-400 rubles/ha), and as a result they will not be able to retain, in the long term, the privately-owned land they are currently using, mainly on trust. Rural people will therefore continue to accept the offers of speculative buyers in the future.

Cash accumulation in other industries

Surplus cash accumulated in other sectors of the economy may encourage non-agricultural business to buy land from rural landowners. This hypothesis has been prompted by the analysis of the high demand for land in some regions close to Moscow Oblast. The available statistical data point to the following factors: Surplus profits that are not used for investment in assets are increasing, deposits in Russian banks are becoming less attractive, and the decrease of the dollar/ruble exchange rate drives depositors away from foreign-currency accounts. Real-estate prices begun to grow in 1999, and they are now at their peak, with experts predicting an imminent fall in prices. All these factors have encouraged businesses to search for new investment opportunities. The demand for suburban homes, the poverty of rural land-share owners, and the end of the debate about the buying and selling of agricultural land have made it possible for non-agricultural businesses to buy agricultural land. For a more detailed discussion of these developments see RYLKO and JOLLY (2005).

4 CONSTRAINTS ON LAND TRANSACTIONS

Analyzing the 2003 BASIS survey and Roszemkadastr data on sources of land used by agricultural producers, we conclude that farms of all types heavily rely on leased land and some even purchase land from individual and corporate owners. Yet the state land registry contains records of relatively few transactions that represent a very small portion of agricultural land. Two main groups of reasons may be responsible for this curious state of affairs. First, there is a general lack of market information pertinent to land transactions. The agents do not have sufficient knowledge of mechanisms and procedures necessary for the registration of land transactions. Many rural people still do not know that land transactions are allowed and prefer to deal informally; many do not know how to draw up a contract or where to get standard forms for this purpose. Second, the legal registration procedures are very cumbersome, costly, and time-consuming. People may be avoiding land registration because of such bureaucratic barriers.

**Table 4.1 Main constraints to registration of land transactions
(percent of respondents)**

| | All respondents (n=558) | Corporate farms (n=142) | Peasant farms (n=214) | Household plots (n=202) |
|----------------------------------|----------------------------|-------------------------------|--------------------------|-------------------------------|
| No need to register | 42 | 44 | 17 | 69 |
| Lack of information | 18 | 23 | 11 | 23 |
| High costs | 19 | 10 | 34 | 7 |
| Complex procedures | 16 | 15 | 25 | 6 |
| Clear procedures, no problems | 23 | 23 | 36 | 9 |

Source: 2003 BASIS survey; numbers do not add up to 100 % because multiple answers were allowed.

These groups of obstacles have been suggested by the analysis of the survey responses as summarized in Table 4.1. It may be instructive to note some differences across farms of different organizational types. Thus, the large corporate farms and small household plots both feel that they can disregard registration requirements. This is far less the case for peasant farms, who are apparently much more sensitive to the protection they get through land registration. At the same time, peasant farmers complain much more frequently of high registration costs and complex procedures. Somewhat paradoxically, however, more than one-third of the peasant farmers report that the registration procedures are clear and they have no problems in that respect (last line in Table 3.1).

4.1 Lack of market information

Respondents of the 2003 BASIS survey were asked if land transactions were permitted, if they knew the land prices, if they knew where to find a standard lease contract form and how to register a transaction. With the exception of Rostov's peasant farmers (12 %), 22 %-32 % of the respondents indicated that a lack of information on these matters was a problem for engaging in land transactions. Land price information and transaction registration procedures were mentioned as the most important obstacles.

Most respondents did not know the prevailing land prices. The survey showed that many (though not all) knew the land tax rate: 33 %-50 % of respondents in different groups knew what the land tax was because they paid it once or twice a year. However, most respondents could not answer the other questions. The response rate was highest among the peasant farmers in Rostov, where land transactions were more frequent and the interest in the enlargement of holdings greater (Table 4.2). The fact that most respondents did not know the prevailing land prices apparently means that there are no established prices for land. There is no benchmark that could help rural people with the decision to sell or lease land.

Table 4.2 Frequency of responses to land-price questions (percent)

| Farm type | Land tax | Lease payments | | Buy-and-sell price | | | Number of respondents |
|------------------|----------|----------------|------------|--------------------|------------|----------------|-----------------------|
| | | State land | Land share | Land share | State land | Corporate land | |
| Ivanovo | | | | | | | |
| Corporate farms | 49 | 20 | 17 | 3 | 0 | 0 | 35 |
| Peasant farms | 70 | 20 | 50 | 0 | 0 | 0 | 10 |
| Household plots | 34 | 3 | 2 | 1 | 0 | 0 | 94 |
| Nizhnii Novgorod | | | | | | | |
| Corporate farms | 49 | 8 | 5 | 3 | 0 | 3 | 39 |
| Household plots | 45 | 11 | 12 | 1 | 2 | 2 | 93 |
| Rostov | | | | | | | |
| Corporate farms | 53 | 14 | 26 | 9 | 0 | 1 | 70 |
| Peasant farms | 47 | 46 | 49 | 27 | 2 | 1 | 209 |

Source: 2003 BASIS survey.

The issue of the market price of land is of special importance because the 2003 Federal Law on Agricultural Land Transactions mandates the use of market prices in the process of the partitioning of land in joint, shared ownership (i.e., when converting land shares into plots). According to this law, disputes between withdrawing and remaining owners are resolved by applying the market price of specific land plots (on a per share basis). If the agricultural land market is not developed and there are no consistent land prices in the district, it is impossible to speak of the market price of specific fields and plots. This is a severe barrier to the partition of joint shared land and to the withdrawal of share owners with land plots for individual farming.

4.2 High registration costs and complex procedures

Expert judgments suggest that high registration costs and complex procedures are an obstacle to land transactions. This view is confirmed by the responses of the Rostov peasant farmers, who have the highest tendency toward land enlargement. Indeed, most of the peasant farmers in Rostov (84 %) regard those two issues as a major problem (Table 4.3; in other regions, where land markets are less developed, a much smaller percentage of respondents addressed these issues).

The analysis of registration procedures shows that governmental bodies have created numerous administrative and organizational restrictions to land registration. In the land registration system in force until 1998, all the procedures were carried out by a single administrative level – the district committees for land resources and land planning. These committees kept the land redistribution maps, the lists of shared landowners, copies of land ownership certificates, and other documents confirming land rights. The district committees also registered the transactions with land shares and land plots. This system was changed in 1998.

At present, three organizational levels are involved in the registration of land transactions: (1) district committees for land resources and land planning; (2) district divisions of regional registration chambers (subordinated to the Ministry of Justice); (3) district divisions of regional cadastral chambers.

Table 4.3 Are high registration costs and complex procedures an obstacle to land transactions? (percent of yes responses)

| Regions | Peasant farms and household plots | Corporate farms |
|------------------|-----------------------------------|-----------------|
| Ivanovo | 10 | 12 |
| Nizhnii Novgorod | 15 | 5 |
| Rostov | 84 | 58 |

Source: 2003 BASIS survey.

The new system suffers from at least two serious problems. The first problem is the refusal of the cadastral chambers to issue registry extracts for land plots in joint shared ownership. In theory, previously issued certificates of land ownership rights have the same validity as new entries in land registers, but in practice each new transaction requires full registration of the previous rights. As a result, the whole area in joint, shared ownership (often several thousand hectares) has to be surveyed. This is not only a very expensive operation (500 rubles per hectare), but it also takes a long time to complete (at least two months). The second problem is the multi-step and opaque operation of the registration and cadastral chambers, especially regarding the requirements for documents. These bodies develop internal instructions that are not always compatible with the relevant law and require additional documents that were not envisaged by the law. These administrative barriers involve additional expenses for the applicants and lead to a sharp increase in transaction costs.

Table 4.4, based on a case study for Moscow Oblast in 2004, lists the various organizations that are involved in the process of selling a land share or requesting conversion of land shares into a physical plot. The numbers in the table show the sequence of actions for a landowner in his dealings with these organizations. The sequence of actions for registering previously existing rights is shown separately in column 2. Registering rights associated with a new transaction is identical to the registration of previously existing rights. The case study in Table 4.4 assumes that the share owner has a land ownership certificate in his possession, i.e., a document that certifies his ownership rights and theoretically has the same validity as a record in the State Register of Rights.

Table 4.4 List of organizations involved in the registration of a transaction with land shares (column 1) and the sequence of relevant actions (columns 2-4): Moscow Oblast, 2004

| (1) | Registration of previous rights (2) | Selling a land share (3) | Converting 10 land shares into a 42 ha plot (4) |
|--------------------------------------|--|-----------------------------|--|
| Registration chamber | 1, 8 | 3 | 7 |
| Land committee | 5 | | 5 |
| Cadastral chamber | 3, 6* | 4 | 6, 8 |
| District archive | 7 | | |
| Corporate farm | 2 | | |
| Surveyor | 4* | | 5 |
| District newspaper | | 1 | 1, 4 |
| Notary | | | 3 |
| General assembly of land-plot owners | | | 2 |
| Ministry of Real Estate | | 2 | |
| Total elapsed time | From two weeks to six months | Not less than three months | From three to six months |
| Cost, '000 rubles | 0.3-1.5* | Not less than 2.4 | Not less than 88.1 |

Note: * In case of refusal to issue a cadastral extract.

As Table 4.4 shows, the costs of registering previously existing ownership rights vary widely. Theoretically, the total shared area is already registered in the cadastre and the applicant has only to pay 100 rubles to get the cadastral extract for his land share. In practice, however, officials often require a full survey for the identification of the individual plot, which is too expensive for the private landowner. This requirement is apparently based on the provisions of the 2001 Law on Agricultural Land Transactions, which stipulates that land in joint, shared ownership should be physically divided into plots, a very costly proposition for the small landowners.

The calculations in Table 4.4 were carried out assuming that each action requires only one visit to the administrative office. Usually, each action requires at least three visits, and the time delays are substantially longer than shown. In the author's own experience, the withdrawal of a single land plot from joint, shared ownership requires up to one year of constant occupation. The cost of the entire procedure of converting a land share into a plot of land (according to the actions in column 4 of Table 4.4) can be estimated by comparing the market price of a land share with the market price of a registered plot in the same area. In Volokolamsk, near Moscow, the price of a plot is double the price of a land share before conversion.

While the registration procedure is determined by law, the law does not specify the precise requirements for documents. That is why officials at the local level set

their own demands. In Moscow Oblast, nine out of the ten steps that an applicant has to complete are not prescribed by the law, require submission of additional documents, or are part of a list of verbal requirements that are not listed in any official document. In this situation, corporations that can afford to hire advisors and have specialized staff responsible for transaction registration are in an advantageous position. This is a typical example of market asymmetry, where some agents have more information than others by virtue of their official position, greater financial possibilities, or the ability to hire experts. Land-share owners, peasant farmers, and traditional corporate farms are weak players in this process: They have to spend so much time and money on registration that they often simply give up their rights or use land that is not legally registered.

In order to simplify the land purchase procedure, buyers resort to general power of attorney or give the land away as a gift. With general power of attorney, the seller gets the money and empowers a third person to sell the land share and complete all the necessary arrangements. With a gift of land, there is no need to offer the share to other pre-emptive buyers (the joint owners, the oblast government, or the municipality). These "under-registration" mechanisms are risky for the buyer, as power of attorney can be revoked before the registration of rights transfer to the buyer is completed, and a gift can be annulled as a fictitious transaction. Still, buyers are willing to take the risk because the prices of land rise so quickly (the price of land in Mozhaisk near Moscow increased by a factor of 20 between January 2003 and June 2004).

4.3 Expected effect of mortgage on transactions in agricultural land

The inability to mortgage land or, more generally, to use it as collateral for obtaining credit, is often cited in the literature as a major obstacle to the buying and selling of land. The mortgage of agricultural land was allowed only in January 2004 by a special amendment of the 1998 general mortgage law. However, the language of the original mortgage law extended to agricultural land imposes certain conditionalities that are highly restrictive in the new context. Thus, only a land plot can be mortgaged, while most agricultural land is in joint shared ownership. Moreover, only owned land can be mortgaged, and owned land accounts for a mere 1.3 % of agricultural land used by corporate farms.

These legal provisions suggest that although the 2004 amendment formally allows agricultural land to be mortgaged, the technical barriers to meeting the basic requirements are practically insurmountable. It therefore seems that at the present stage, land mortgage will have a very limited potential in Russia and will be unable to fulfill its theoretical role as a facilitator of transactions in land.

5 CONCLUSIONS

Russia has met the necessary pre-conditions for the development of agricultural land markets: Agricultural land has been largely privatized, individual landowners have legal rights to most agricultural land in the country, and previous prohibitions on the buying and selling of land have been removed by recent laws. Land markets have responded positively to these changes and we are beginning to witness transactions that involve individual landowners, and not only the state. While the Russian media, politicians, and scholars generally argue that market development is restricted by the low demand for agricultural land, our survey results seem to indicate that this is not really so: A substantial proportion of farms in some regions are actually interested in expanding their holdings.

However, further development of the embryonic land market is severely circumscribed by the inadequacy of the administrative and technical infrastructure. There is no public registry of plans and maps that can be used to complete the transactions, the bureaucracy has created numerous procedural obstacles that complicate land transactions, and the agents, effectively, do not have access to market information about land prices or demand and supply of land. All these factors contribute to very high transaction costs in land markets. In the absence of competitive demand for agricultural land in many regions, landowners have no motivation to complete the required procedures for registration of their property rights, be it registration of land shares or physical plots. The actual costs are simply not justified by the expected benefits from making their property "ready for the market".

Market constraints – both legal and administrative – exist in all countries in the world. The Treaty of Rome, which governs the accession to the European Union, recognizes the right of member countries to keep their national property rules, and the new members have received special permission to maintain constraints on land markets during the next decade. Yet restrictions on the transferability of land and general non-transparency from which land markets so often suffer throughout the world (and not only in Russia) are serious obstacles to achieving economic efficiency. In Russia, particular attention is required to create adequate market information systems and significantly reduce transaction costs. Measures in these areas will hopefully alleviate the main barriers to land transactions in this huge, land-rich country.

REFERENCES

GOSKOMSTAT (2001): *Statistical Yearbook 2001*, Goskomstat, Moscow.

GOSKOMSTAT (2003a): *Statistical Yearbook 2003*, Goskomstat, Moscow.

- GOSKOMSTAT (2003b): *Soetsial'noe polozhenie u uroven' zhizni naseleniya Rossii*, Goskomstat, Moscow.
- GOSKOMZEM (2000): *Svedeniya o sdelkakh s zemlei*, Goskomzem, Moscow.
- ROSZEMKADASTR (2002a): *Zemel'nyi fond Rossii 2001*, Roszemkadastr, Moscow.
- ROSZEMKADASTR (2002b): *Svedeniya o sdelkakh s zemlei i platezhakh za zemlyu*, Roszemkadastr, Moscow.
- ROSZEMKADASTR (2003a): *Gosudarstvennyi (natsional'nyi) doklad o sostoyanii i ispol'zovanii zemel' v Rossiiskoi Federatsii v 2002 g.*, Roszemkadastr, Moscow.
- ROSZEMKADASTR (2003b): *Zemel'nyi fond Rossiiskoi Federatsii na 1.01.03 g.*, Roszemkadastr, Moscow.
- ROSZEMKADASTR (2004): *Zemel'nyi fond Rossii 2003*, Roszemkadastr, Moscow.
- RYLKO, D., JOLLY, R. (2005): Russia's new agricultural operators: Their emergence, growth, and impact, *Comparative Economic Studies*, Vol. 47, No. 1, pp. 115-126.
- UZUN, V. (2005): Large and small business in Russian agriculture: Adaptation to market, *Comparative Economic Studies*, Vol. 47, No. 1, pp. 85-100.

PUBLIC QUALITY SCHEMES – HELPING ENSURE WELL-FUNCTIONING AGRI-FOOD MARKETS IN CENTRAL AND EAST EUROPEAN COUNTRIES?

*ECKHARD BENNER**

ABSTRACT

Western governments regard public quality schemes as an agricultural policy instrument for improving a market's functioning, as do governments of Central and Eastern European countries. But from a consumer perspective, governments have to take an essential information role for the functioning of markets for credence qualities. This paper analyses public quality schemes in this regard by applying the Persuasion Knowledge Model, which concludes that by establishing public quality schemes, governments will jeopardise rather than improve market functioning.

Keywords: Credence qualities, quality schemes, public intervention, consumer information, Persuasion Knowledge Model.

1 INTRODUCTION

The domestic agricultural and food sectors are relatively important for the economic performance of Central and Eastern European countries. Yet in these countries the markets for agricultural and food products do not function without friction. Farmers do not obtain the income level they would if markets were well functioning. Furthermore, the development of rural areas, as well as that of the respective national economies, falls short of their potential.

From a market-economy perspective, one reason for poorly-functioning agri-food markets may be the inexperience of farmers and farmer groups with

* Author's note: Dr. Eckhard Benner is an agricultural economist and Lecturer at the Department of Agricultural Policy and Markets (Inst. 420b), University of Hohenheim, Stuttgart, Germany.

market-oriented business management, i.e., with marketing instruments. Farmers' lack of experience and farmer groups with marketing instruments may suggest that governments in CEE countries should support farmers' marketing efforts by establishing public quality schemes.

Public intervention through establishing public quality schemes is justified by arguments of transaction cost economics (LIPPERT and THIEDIG, 2001) or welfare economics (e.g. HERRMANN et al., 2000; and, generally, FORKER and WARD, 1993), though there are counter-arguments based on welfare economics (see e.g. COULIBALY and BRORSEN, 1999; v. ALVENSLEBEN, 1991). However, from the consumer perspective, governments have a vital informational role to play in well-functioning markets. This role differs by design from public quality schemes.

The paper will analyse public quality schemes by taking into account governments' informational role. It will be shown that governments jeopardise rather than improve the functioning of markets when establishing public quality schemes.

The remainder of the paper is organised as follows. Section two will describe public quality schemes as policy instruments. Section three will present the rationale of public consumer information by referring to information economics. Section four will present a consumer model, which describes how consumers cope with persuasive attempts in the market place. Section five will discuss the impact of public quality schemes on market functioning. Finally, Section six will present policy implications.

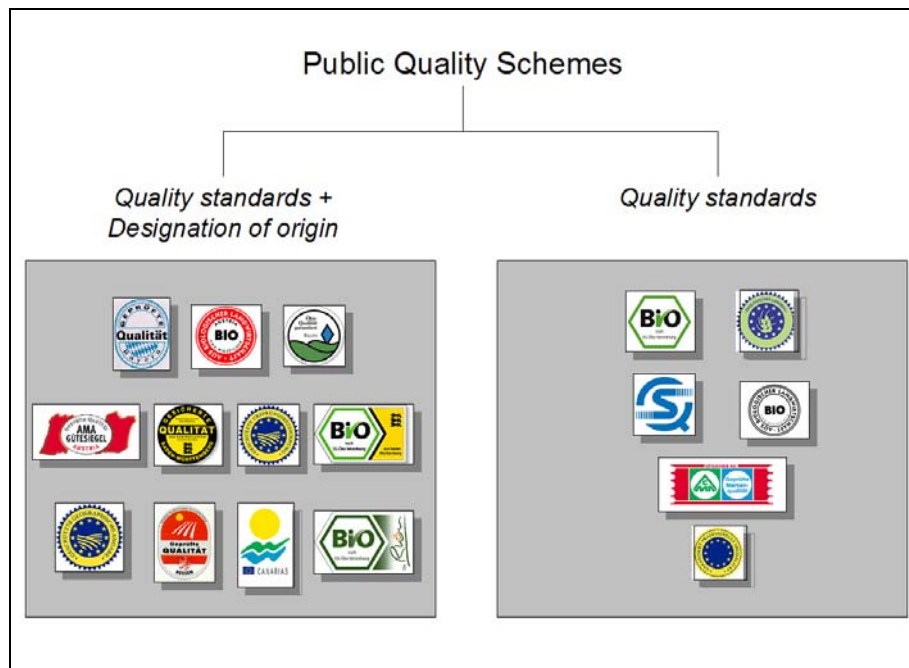
2 PUBLIC QUALITY SCHEMES

Public quality programs are intensively used measures by (local, regional, national and supranational) governments to promote agricultural products and food. For example, nearly every German federal state has established a quality scheme for conventional agricultural products or a scheme for organic products.

From an agricultural policy perspective, public quality schemes supplement agricultural policy instruments such as price guarantees, income support, production restraints and environmental and social measures. They aim to increase demand for promoted products. With respect to the number of beneficiary farmers, two forms of public quality schemes exist: Those that restrict support to farmers residing within a specific geographical area and those that do not restrict support in such a way. Schemes which restrict support are usually accompanied by a designation of origin (see Figure 1). Yet within the EU, establishing public schemes with a designation of origin is constrained by

Article 28 of the European Treaty (GERICHTSHOF DER EUROPÄISCHEN GEMEINSCHAFTEN, 2002; BECKER and BENNER, 2000).

Figure 1: Public quality schemes



Source: Own representation.

However, from a marketing perspective, public quality schemes are meant to support farmers' marketing efforts in two respects: They encourage farmers' product policy by establishing a quality term, and they encourage farmers communication policy by establishing a quality label (signalling that certain quality standards are met) and conducting information campaigns.

Quality terms define product and process requirements (e.g. organic standards, animal husbandry, pest management), as well as some kind of monitoring. Thus, only farmers whose products meet the defined standards are supported by public quality schemes. A quality label graphically displays a quality term, and aims to simplify consumers' perception. As such, a quality label represents an "official brand" (compare BENNER, 2003, p. 44). Whether or not the government acts visibly as the principal of information campaigns, two forms of public quality schemes can be distinguished: Direct and indirect advertising. Direct advertising is conducted by the government itself (e.g. government's departments, eventually supported by an advertising agency). With indirect advertising, a government establishes a semi-state institution either by a check-off program or by public spending. A semi-state institution set into operation by a check-off program is funded by a legal levy on agricultural commodity sales (e.g. per cow head or per kiloliter milk) raised by the first handler of the commodity (bottle neck, i.e., slaughterhouse or dairy) (FORNER and WARD, 1993, p. 2, and compare GERICHTSHOF DER EUROPÄISCHEN GEMEINSCHAFTEN, 2002), for an example, see

the German Zentrale Marketinggesellschaft der deutschen Agrarwirtschaft (CMA). An example of a semi-state institution set into operation by public spending, (partly) funded from the government's budget, is the Marketing- und Absatzförderungsgesellschaft Baden-Württemberg (MBW).

The success of "official brands" relies on uniqueness regarding their market position. Such a position is based on high communication pressure, emotional positioning, and consistently high product and process quality. But by aiming to support a majority of farmers, it is difficult to achieve a unique market position: Often, public quality schemes come along with relatively low product and process standards, and a high level of uniformity of the labeled products (compare SPILLER, 2001).

3 PUBLIC CONSUMER INFORMATION

Generally, a public contribution to information provision is necessary if markets are characterised by asymmetric information and this asymmetry can not be removed by private efforts alone (FRITSCH et al., 1999). From a consumer perspective, a market situation characterised by asymmetric information exists, with transactions relying on credence qualities. Credence qualities are product attributes, which consumers cannot verify, neither before nor after purchase (DARBY and KARNI, 1973). Credence qualities are e.g. organic production, methods of animal husbandry, and the use of pesticides.

With credence qualities, consumers rely on the truthfulness of provided information. Trust in provided information and its source, respectively, has to replace self-evaluation (HAUSER, 1979, p. 751). Thus, every communication effort attempting to transmit a credence quality faces the problem of credibility. Moreover, transmitting credence qualities calls for a minimum level of credibility. With credibility too low, market transactions based on a credence quality do not take place (BENNER, 2004). Supposing a syllogistic relation between information credibility and source credibility (LUTZ, 1985, pp. 49), the same is true for source credibility. As pointed out by the following, this problem of credibility necessarily calls for a specific form of public intervention.

Advertising is, for firms', a vital means for information provision. However, at the same time, advertising is a form of persuasive communication. Advertising anticipates the result of consumer's reflection about its content. For that purpose it transmits information within a framework of rhetorical stylistic devices. The framework consists of purposefully selected words as well as a purposefully arranged structure of argumentation (BEHRENS, 1996; SCOTT, 1994; MCQUARRIE and MICK, 1996; TOM and EVES, 1999; MCQUARRIE and MICK, 2003; MALKEWITZ et al., 2003). Thus, when based on advertising, consumers always decide based on provided product valuations, which serve the purpose of persuasion.

In the anonymous market place, therefore, firms' advertising efforts are unsuitable for transmitting credence qualities. In order to be understood as being credible, advertising always refers to consumers' everyday knowledge about credibility (WILLEMS, 1999). For this, advertising reverts to dramatising strategies (e.g. mentioning a guaranty or an award, etc.). Yet, since consumers are not able to evaluate credence qualities, they never can feel confident, whether e.g. mentioning a guaranty doesn't merely serve to stage credibility.

For that reason, taking the consumer perspective into account, marketing credence qualities must always be assured through product and process monitoring by a third party (MCCLUSKY, 2000). However, even with third parties, consumers can never feel confident whether certification doesn't merely serve to stage credibility (TEISL and ROE, 1998, p. 144). Furthermore, private monitoring systems could be easily circumvented, since participation is voluntary and third parties are not authorised to exercise coercion. But without mandatory participation, the existence of credence goods is not guaranteed. Thus, public intervention is imperatively needed (MARETTE et al., 2000), because within democratic societies the state is the sole institution, which is allowed to exercise coercion (e.g. via mandatory regulations) to which firms have to stick to without exception. In democratic societies, citizens voluntarily assign the possibility of exercising coercion to the state (STIGLITZ, 1989).

The required public intervention consists of three features, which have to be regulated by law: Firstly, product and process requirements have to be determined, by which a normative term of the credence quality is defined. Secondly, a monitoring system has to be established to ensure compliance with the determined product and process requirements. Public monitoring must be able to gain relevant information, to detect a breach of law, and be enforced, i.e., public authorities must stick to the regulation as well, even if there are limits to enforcing them (STIGLITZ, 1998), otherwise the monitoring system is still open to fraud (BAIRD et al., 1995, pp. 95; GIANNAKAS, 2002). Finally, an informational campaign has to be conducted that informs consumers about the content of the public intervention. However, such an information campaign should follow specific requirements for public consumer information, transmitting information in a way that enables and facilitates consumers to reflect on their genuine needs (SCHERHORN, 1979, pp. 37). In doing so, it does not advise the direction and result of the consumers' reflection, and accepts the primarily achieved results. The campaign follows neither business interests (EINSIEDEL, 1998, p. 411) nor governmental interests (FRITSCH et al., 1999, p. 279), and does not put these interests against consumer interests. Particularly, the campaign forbears emotional pleas (SCHERHORN, 1979, pp. 35). For the sake of clarity, this type of consumer information will below be called "literal consumer information".

Public intervention of this kind is intimately connected with governments, since governments are at least its executors, if not its initiators. Governments are normally involved in public monitoring and communication through some of its departments or responsible authorities, see for example the monitoring systems for organic production of the EU Member States (LAMPKIN et al., 1999).

In the anonymous market place, this type of public intervention constitutes the necessary trust in products and credibility of market information and market actors, and lets markets for credence qualities evolve and function well.

4 THE PERSUASION KNOWLEDGE MODEL

The Persuasion Knowledge Model (PKM) is a consumer model, which describes how a consumer copes with persuasion attempts with which he is exposed in the market place (see FRIESTAD and WHRIGHT, 1994).

The initial point of PKM is the assumption that the consumer acts in order to pursue his own market goals. Its foundation is a consumer's ability to deliberate comprehensively about persuasion in general and advertising in particular, and independently from current persuasion attempts.

A consumer's deliberation is independent from current persuasion attempts since the consumer is able to deliberate about persuasion not only when he is directly exposed to an attempt, but also at any other time. His deliberation is comprehensive, since all perceived features of the considered persuasion attempt are incorporated into it. The topic of a consumer's deliberation is both the credibility of the advertisement, and the tactics and objectives of the advertising agent, as well as of the agents principles. With the assistance of his deliberation, the consumer is able to control his behaviour during a persuasion attempt and to shape the attempt according to his own market goals. This is not to say that consumers' deliberation is based upon complete information. Rather, it is said that consumers' deliberation is based upon more information than is made available by an information source and its means (e.g. advertisement). During the deliberation, the consumer draws upon his "knowledge of persuasion".

In contrast to other consumer models (e.g. Elaboration-Likelihood-Model), PKM does not assume that the consumer copes with persuasion attempts by only using his product knowledge and reacts on stimuli delivered by e.g. an advertisement, but also by using his knowledge of persuasion. Consumer's knowledge of persuasion consists "of interrelated beliefs about the psychological events that are instrumental to persuasion, the causes and effects of those events, the importance of the events, the extent to which people can control their psychological responses the temporal course of the persuasion process, and the effectiveness

and appropriateness of particular persuasion tactics" (FRIESTAD and WHRIGHT, 1994, p. 6).

The fundamental component of a consumer's knowledge of persuasion is a society's own common knowledge about persuasion ("folk wisdom on persuasion"). The extent of the foundation varies on both social and individual levels. At the social level, the extent varies over time, since at different times a society holds different levels of knowledge of persuasion. This knowledge is enlarged as e.g. scientific insights find their way to laymen. At the individual level, the consumer expands his knowledge of persuasion actively and passively. He actively expands his knowledge of persuasion through interpersonal interaction and his own experience with persuasive attempts. Besides, he passively expands his knowledge of persuasion by conversations which influence feelings, cognition, and behaviour, as well as by reading, seeing and hearing media comments on marketing tactics.

Through these changes of a consumer's knowledge of persuasion, and caused by his deliberation, a consumer's behaviour and attitudes towards information campaigns and information sources can be changed ("change-of-meaning-principle"). The basic change is provoked when a feature of an information campaign or an activity of an information source is first perceived as a persuasive tactic. Since the consumer is interested in the principal ("the puppet masters") and his goals, the change in behaviour and attitudes does not only include the immediate information source, but also its principal.

5 DISCUSSION

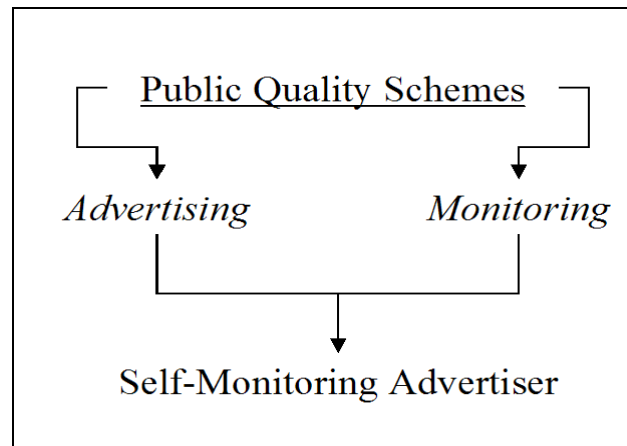
A main feature of public quality schemes is promoting agricultural products characterised by credence qualities, e.g. organic production, pest management or animal husbandry standards.

From a consumer's point of view, purchasing such products requires credible information. To obtain credibility, business information efforts necessarily rest on a legally enforced system that consists of three features: A legal term, a public monitoring system, and literal consumer information (see Section 3).

However, when establishing public quality schemes, governments indeed would establish some kind of public monitoring and quality term (even though not necessarily legally enforced) and would be engaged in conducting advertising (i.e., persuasive information) instead of conducting literal consumer information (see Sections 2 and 3). Thus, with public quality schemes, governments seek to urge consumers to bring their consumption decisions into line with agricultural policy objectives (compare BENNER, 2003).

Furthermore, from a consumer's perspective, by establishing public quality schemes, governments play a double role: That of "self-monitoring advertisers" (see Figure 2). By holding such a role, a government acts like any enterprise that has installed a privately-driven monitoring system and advertises its product at the same time (see Section 3).

Figure 2: Governments double role



Source: Own representation.

Consumers recognise the government's double role since they deliberate comprehensively about persuasive attempts (see Section 4). This recognition becomes particularly important when one enterprise or a group of enterprises engaged in marketing agricultural products characterised by a credence quality fails to comply with the legal system, i.e., market a product with specific claims, but do not produce said product according to the (assumed) legal definition.

In such a case, consumers exceedingly rely on the government (or on one of its executive authorities) as a credible information source. Because in the case of non-compliance, consumers have to be capable of discriminating between products from enterprises which comply with the legal standard and products from enterprises that do not. Thus, consumers must be able to discriminate between the failure of a single enterprise (or a group of enterprises) and the breakdown of the whole monitoring system. In order to be capable of discriminating, it is imperative that consumers receive information that possesses an extraordinary degree of credibility. Since this particular discrimination applies to a credence quality, the only source which can provide such required information is the government (see Section 3).

By taking on the role of the self-monitoring advertiser, the government promises the everlasting reliability of the legal monitoring system, at least implicitly (just as an enterprise implicitly assures the reliability of its control system by promising, via advertising, the existence of a particular product attribute (see Section 3)). However, a recognised instance of non-compliance conflicts with such a promise. As a result, the reliability of the legal monitoring system will be challenged, and

the government will be displayed as an untrustworthy information source. As a result of such a situation, the government would lose credibility, and that loss would become manifest in a decrease in demand, or even a demand refusal. Finally, the market for the promoted products would break down ("policy of recurring market breakdown", see BENNER, 2003, p. 139).

6 POLICY IMPLICATION

Governments must work intensively to ensure the credibility of both market information and themselves. Facing the problem of asymmetric information and the danger of market breakdowns, CEE governments (as well as EU Member states) must not engage in public quality schemes, because this engagement will jeopardised the well functioning of markets, and, hence, the development of rural areas (see Section 5).

However, governments' contribution to overcoming the problem of asymmetric information with respect to consumers' decision-making based on credence qualities is required. So instead of establishing quality schemes, governments should financially support the efforts of consumer organisations to provide literal consumer information. Moreover, within the European Union, a European ordinance is required for literal consumer information (see BENNER, 2003).

REFERENCES

- BAIRD, D. G., GERTNER, R. H., PICKER, R. C. (1995): Game theory and the law, Harvard University Press, London.
- BECKER, T., BENNER, E. (2000): Zur Problematik der Herkunftsangabe im regionalen Marketing, INSTITUT FÜR AGRARPOLITIK UND LANDWIRTSCHAFTLICHE MARKTLEHRE, UNIVERSITÄT HOHENHEIM (ed.): *Hohenheimer Agrarökonomische Arbeitsberichte Nr. 1*, Stuttgart.
- BEHRENS, G. (1996): Werbung: Entscheidung – Erklärung – Gestaltung, Vahlen, München.
- BENNER, E. (2003): Staatliche Unterstützung von Werbung für landwirtschaftliche Erzeugnisse als Instrument der Agrarpolitik – Beschreibung, Analyse und Weiterentwicklung am Beispiel des EG-Konzepts der Werbeförderung, Lang, Frankfurt/M.
- BENNER, D. (2004): Quality ambiguity and the market mechanism for credence goods, Institut für Agrarpolitik und Landwirtschaftliche Marktlehre, Stuttgart, INSTITUT FÜR AGRARPOLITIK UND LANDWIRTSCHAFTLICHE MARKTLEHRE, UNIVERSITÄT HOHENHEIM (ed.): *Hohenheimer Agrarökonomische Arbeitsberichte Nr. 9*.
- COULIBALY, N., BRORSEN, B. W. (1999): Explaining the differences between two previous meat generic advertising studies, *Agribusiness*, Vol. 15, pp. 501-515.
- DARBY, M. R., KARNI, E. (1973): Free competition and the optimal amount of fraud, *Journal of Law and Economics*, Vol. 16, pp. 67-88.

- EINSIEDEL, E. F. (1998): The market for credible information in biotechnology, *Journal of Consumer Policy*, Vol. 21, pp. 405-444.
- GERICHTSHOF DER EUROPÄISCHEN GEMEINSCHAFTEN (2002): Rechtssache C-325/00, Urteil des Gerichtshofes vom 5. November 2002, Freier Warenverkehr – Maßnahmen gleicher Wirkung – Güte- und Herkunftszeichen, *Sammlung der Rechtsprechung des Gerichtshofes und des Gerichts erster Instanz, Teil I, Gerichtshof*, pp. 9977-10005.
- FORKER, O. D., WARD, R. W. (1993): Generic advertising: The economics and measurement of generic programs, Lexington Books, New York.
- FRIESTAD, M., WRIGHT, P. (1994): The Persuasion Knowledge Model: How people cope with persuasion attempts, *Journal of Consumer Research*, Vol. 21, pp. 1-31.
- FRITSCH, M., WEIN, T., EWERS, H.-J. (1999): Marktversagen und Wirtschaftspolitik: Mikroökonomische Grundlagen staatlichen Handelns, Vahlen, München.
- GIANNAKAS, K. (2002): Information asymmetries and consumer decisions in organic food product markets, *Canadian Journal of Agricultural Economics*, Vol. 50, pp. 35-50.
- HAUSER, H. (1979): Qualitätsinformation und Marktstrukturen, *Kyklos*, Vol. 32, pp. 739-763.
- HERRMANN, R., KRISCHIK-BAUTZ, S., THOMPSON, S. (2000): Möglichkeiten der Erfolgskontrolle regionaler Vermarktungssysteme auf Grundlage quantitativer Methoden, *agrarspectrum*, Vol. 30, pp. 156-178.
- LAMPKIN, N., FORSTER, C., PADEL, S. (1999): The policy and regulatory environment for organic farming in Europe: Country reports, Universität Hohenheim, Stuttgart.
- LIPPERT, C., THIEDIG, F. (2002): Staatliche Förderung geographischer Herkunftsangaben für Lebensmittel und Agrarprodukte – Wohlfahrtstheoretische Analyse und Implikationen für die WTO-Verhandlungen, in: BROCKMEIER, M., ISERMEYER, F., CRAMON-TAUBADEL, S. (eds.): Liberalisierung des Weltagrarhandels – Strategien und Konsequenzen, *Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e.V.*, Vol. 37, Münster-Hiltrup, pp. 149-158.
- LUTZ, R. J. (1985): Affective and cognitive antecedents of attitude towards the Ad: A conceptual framework, in: ALWITT, L. F., MITCHEL, A. A. (eds.): *Psychological processes and Advertising effects*, Lawrence Erlbaum Associates, London, pp. 45-63.
- MALKEWITZ, K., WRIGHT, P., FRIESTAD, M. (2003): Persuasion by design: The state of expertise on visual influence tactics, in: SCOTT, L. M., BATRA, R. (eds.): *Persuasive imagery: A consumer response perspective*, Erlbaum, Mahwah, NJ, pp. 3-15.
- MARETTE, S., BUREAU, J.-C., GOZLAN, E. (2000): Product safety and consumers' information, *Australian Economic Papers*, Vol. 39, pp. 426-441.
- MCCLUSKY, J. J. (2000): A game theoretic approach to organic foods: An analysis of asymmetric information and policy, *Agricultural and Resource Economics Review*, Vol. 29, pp. 1-9.
- MCQUARRIE, E. F., MICK, D. G. (1996): Figures of rhetoric in advertising language, *Journal of Consumer Research*, Vol. 22, pp. 424-438.
- MCQUARRIE, E. F., MICK, D. G. (2003): Visual and verbal rhetorical figures under directed processing versus incidental exposure to advertising, *Journal of Consumer Research*, Vol. 29, pp. 579-587.

- SCHERHORN, G. (1979): Verbraucherpolitische Einordnung und Begründung des Projekts "Strategien der Verbraucherinformation", UNIVERSITÄT HOHENHEIM, INSTITUT FÜR HAUSHALTS- UND KONSUMÖKONOMIE (ed.): *Arbeitspapier 1*, Stuttgart.
- SCOTT, L. M. (1994): Images in advertising: The need for a theory of visual rhetoric, *Journal of Consumer Research*, Vol. 21, pp. 252-273.
- SPILLER, A. (2001): Gütezeichen oder Markenartikel, *Fleischwirtschaft*, No. 6, pp. 47-51.
- STIGLITZ, J. E. (1989): On the economic role of the state, in: HEERTJE, A. (ed.): *The Economic Role of the State*, Blackwell, Oxford, pp. 9-85.
- STIGLITZ, J. E. (1998): Redefining the role of the state: What should it do ? How should it do it? And how should these decisions be made?, The World Bank, Washington, <<http://www.worldbank.org/24.05.2002>>.
- TEISL, M. F., ROE, B. (1998): The economics of labeling: An overview of issues for health and environmental disclosure, *Agricultural and Resource Economics Review*, Vol. 27, pp. 140-150.
- TOM, G., EVES, A. (1999): The use of rhetorical device in advertising, *Journal of Advertising Research*, Vol. 39, pp. 39-43.
- V. ALVENSLEBEN, R. (1991): Probleme des Gemeinschaftsmarketings bei Nahrungsmitteln, in: BREUER, G. (ed.): *Agrarvermarktung in Österreich: Von der Marktordnung zum Marketing*, Service-Fachverlag, Wien, pp. 57-63.
- WILLEMS, H. (1999): Werbung als Medieninszenierung: Genrespezifische Kontextbedingungen und dramaturgische Strategien, *Soziale Welt*, Vol. 50, pp. 115-132.

COMPETITION, MARKET POWER AND ANTIMONOPOLY POLICY: A HAYEKIAN PERSPECTIVE

JÜRGEN WANDEL*

*"The advantages of competition do not depend on it being 'perfect'"
(HAYEK, 1990, p. 65).*

ABSTRACT

The paper highlights the perspective of Hayek and the Austrian School of Economics on competition, market power and antimonopoly policy in contrast to the widely used model of perfect competition of mainstream economists. The paper shows that in economics there is no unanimous agreement on how to assess competition. Neoclassical economists view competition as "perfectly" functioning when prices equal marginal cost, and focus on competition as a means to achieve maximum wealth in the sense of Pareto optimality. For the Austrian school, competition means a dynamic, rivalrous process, whose desirability stems from its ability of being a means of discovery. These differing views on competition result in various implications for antimonopoly policy. Whereas adherents of the perfect market model demand antitrust regulations in order to bring markets in the direction of their benchmark model of "perfect" competition, Austrian economists oppose such regulations on the grounds that this would be inherently incompatible with rivalry.

Keywords: *Competition, Austrian economics, antimonopoly policy.*

* Martin-Luther University Halle-Wittenberg, Institute of Agricultural Economics and Rural Development, Halle (Saale), Germany, E-mail: juergen.wandel@landw.uni-halle.de.

1 INTRODUCTION

The development of competitive markets is a crucial task for establishing functioning market economies in Central and Eastern European countries. In order to assess the development and performance of competition, policy makers need some sort of benchmark. Textbooks on competition theory and policy show that there exists not one, but a whole range of different concepts or models showing what competition should be like (see e.g. MANTZVINOS, 1994; HERDZINA, 1993, p. 113ff., SCHMIDT, 2001, p. 2ff.). However, when looking at empirical studies on this topic, it is striking that scholars often use (without saying) the neoclassical model of perfect competition as a benchmark, just as if other concepts and theories were non-existent (see e.g. SCHROETER, 1988; AZZAM, 1992; MCCORRISTON, 1997).

The model of perfect competition is based on strict assumptions such as the existence of numerous buyers and sellers, homogenous products, complete market transparency, perfect entry and exit from the market, perfect information of economic actors regarding all aspects of production, exchange and distribution activities and an infinite velocity of reactions. As a result of these conditions, the actions of any single buyer or seller have a negligible impact on the market price. The assumption that competitive firms are profit maximizing the price in perfectly competitive markets equals marginal costs. It can be shown that in such a world of perfectly competitive markets the wealth of a society, defined as allocative and distributive efficiency in the sense of Pareto, can be maximized. The advantages of this model are that price formation and the welfare optimum can consistently be derived from the assumptions and that it can serve as a useful tool for didactic purposes, i.e., explaining the principles of price formation in other market forms such as monopoly or oligopoly (STREIT, 2000, p. 19).

However, the model of perfect competition has severe deficiencies for normative analysis, i.e., for trying to assess real world market structures and behaviors and deriving adequate options for competition policy. One of the well-known criticisms is that it compares the real world with an ideal world and is thus not able to explain real world market phenomena. This is why DEMSETZ (1969, p. 1) called this model a "nirvana approach".

A second point is that the model erases the dynamics of competition, since according to its strict assumptions, most parameters for entrepreneurial actions such as price setting, product innovation, quality improvement or advertisement are either not at the disposal of the entrepreneur or he has no incentives to use them (MÖSCHEL, 1984, p. 158). While in such a static world allocation efficiency can be achieved, there is no room for economic progress in the sense of product and production innovations.

A third critical point is that the use of an unrealistic and overly high standard of what competition should be may lead to erroneous options for competition policy. Trying to establish the ideal world would necessitate, as a logical consequence of the model's assumptions, constant government intervention into market structures and behavior in order to remove imperfections. In the extreme case, this would include the prohibition of product innovations or any other innovative actions. Using the model of perfect competition as a standard for judging the performance of competition thus creates the paradoxical situation that a theory whose ultimate goal was to demonstrate the superiority of market forces may turn into a theory which actually favors market interventions because real world markets are anything but perfect (PIES, 1996, p. 7). It is obvious that such a situation would be fatal for any country's welfare, so the model of perfect competition is not of much practical use for competition policy. The main reason for this deficiency is that neoclassical theory, with its benchmark model of perfect competition, has a narrow view of the nature of competition. It regards competition only as a method of achieving a certain kind of social welfare optimum. However, the purpose of competition in a market economy lies far beyond that. It was the Austrian economist and Nobel Prize winner of 1974, Friedrich August von Hayek, who emphasized that the purposes and advantages of competition do not lie in it being "perfect," but in being a discovery procedure.

The aim of this paper is to highlight Hayek's view, as well as that of the Austrian School of Economics, of competition and the issues of market power and anti-monopoly policy in order to make mainstream economists question the too-often uncritical use of their standard model and to provide policy makers with an alternative approach to competition policy.

The paper is organized as follows. Section 2 explains Hayek's principle critique of the neoclassical model of perfect competition. Then Hayek's and the Austrian School's understanding of the purpose of competition is shown in Section 3. Next, the issue of market power and how it can be dealt with by economic policy will be discussed (Sections 4 and 5). The paper ends with concluding remarks for scholars and politicians dealing with competition issues in Central and Eastern Europe (Section 6).

2 HAYEK'S CRITIQUE OF "PERFECT COMPETITION"

Stemming from the conclusions of classical economists like Adam Smith, David Ricardo or John Stuart Mill, which state that an economy based on market transactions is best suitable for ensuring a high degree of wealth of a nation, in the last quarter of the 19th century economic research started to focus its interest on discovering what, precisely, markets should look like in order to *maximize* the

wealth of a nation in the sense of Pareto optimality¹. This so-called neoclassical research, which is linked to names like William Stanley Jevons, Léon Walras or Alfred Marshall, came to the conclusion that Pareto optimality is achieved if there are perfectly competitive markets. The requirements for perfect competition were completely formulated by F. H. KNIGHT in 1921 (p. 75ff). In such a market structure, none of the producers or consumers can influence the price on their own. They are price takers and the price would move instantaneously to equilibrium.² According to proponents of the perfect competition model, any real situation in a market that deviates from this ideal state of affairs is regarded as sub-optimal to societies' well being. It is then recommended that the government intervene in order to improve consumers well-being whenever such deviation occurs.

As mentioned in the introduction, Austrian economists, as typified by LUDWIG VON MISES and FRIEDRICH A. VON HAYEK, are not the only ones who criticize this model's explanation of the nature and purpose of competition in market economies (see also RICKETTS, 2002, p. 13ff.); however, their criticisms have been both pioneering and trenchant (KIRZNER, 1997, p. 63). This criticism is based on two arguments that are, to a certain degree, interlinked. The first argument, already addressed in the introduction, is that the strict assumptions of the model eliminate the very nature of competition as a dynamic process, seeing it as a state of affairs called "competitive equilibrium". Prices, product/resource qualities, and the production and utility function are taken as given "data" to each decision-maker. The only way to act for them is to adapt production quantities to these given conditions. How much they have to produce is thereby already predetermined by the data, i.e., the quantities can be deduced from them. HAYEK (1945, p. 85) calls this the "*Pure Logic of Choice*". In reality, however, market participants compete by bidding higher prices, by offering to undersell competitors or by offering consumers better quality merchandise, better service and the like (KIRZNER, 1997, p. 63f., FEHL, 2002, p. 6f.). In fact, as LUDWIG VON MISES (1949, p. 274) emphasizes, competition "manifests itself in the facts that the sellers must outdo one another by offering better or cheaper goods and services and that the buyers must outdo one another by offering higher prices". Competition is thus "by nature a dynamic process whose essential characteristics are assumed away by the assumptions underlying static analysis. In this sense, "perfect"

¹ Pareto optimality is realized when it is no longer possible to enhance the welfare of one or more economic subjects by a change in the transaction or production conditions without diminishing the welfare of some other subject.

² This is achieved through the so-called "tâtonnement process" associated with Léon Walras. It is supposed that an "auctioneer" sets prices and that economic agents form provisional arrangements at these given prices. If it turns out that excess demand or supply exist, the provisional arrangements lapse and the auctioneer modifies prices in an attempt to eliminate any disequilibrium.

competition "means indeed the absence of all competitive activities," (HAYEK, 1948, p. 96). This in turn means that so-called "data" such as qualities, prices, production technologies or preferences are anything but given. Rather, competition as a process involves a continuous change in exactly these data, brought about by the economic agents themselves (KIRZNER, 1997, p. 70). The significance of competition "must therefore be completely missed by any theory which treats these data as constant," (HAYEK, 1948, p. 106).

This leads to the second and core argument against the perfect market model, which plays the central role in Hayek's scientific work. This is the problem of knowledge, which HAYEK (1937) considers to be the central problem of economics as a social science. Hayek was one of the few economists who continuously emphasized that the knowledge of human beings in and about complex phenomena like a modern economy based on the division of labor is limited. This holds not only for the economic agents acting on the markets but also for the economist observing an economy. Due to his limited cognitive abilities, the single economic agent is not able to acquire full knowledge and information regarding all relevant circumstances of place and time on which he bases his economic decisions. Rather, this knowledge is dispersed among the many people of the society. One economic agent possesses knowledge of one certain circumstance; another agent has knowledge of other facts. But this knowledge is never given to anyone in its entirety; neither to any one of the economic subjects nor to the observing scientists or any omniscient dictator (HAYEK, 1945, p. 77f.). This, however, is assumed in the perfect competition model, which analyses adaptations to so-called objective market data. In reality, the actions of market participants are determined by facts and circumstances that the individual agent has revealed for himself personally and regarded as relevant for his decisions. These facts cannot be stated a priori by means of logic, for they are, to a high degree, the result of subjective evaluations (STREIT, 2000, p. 96).

As a result, HAYEK (1990, p. 67) considers any comparison with a state that might have been achieved if somebody had complete knowledge of all facts as "wholly irrelevant". In fact, for an economic decision-maker, this total knowledge is, in a market economy, not even necessary. What is necessary are sufficient signals about scarcity and their changes, as well as alert economic agents who are ready to take upon themselves transaction costs in order to make use of information for their personal advantage. These signals are, in market economies, the prices, or more precisely the changes in relative prices.

HAYEK (1945, p. 85f.) explains this with the following example: "Assume that somewhere in the world a new opportunity for the use of some raw material, say, tin, has arisen, or that one of the sources of supply of tin has been eliminated. It does not matter for our purpose – and it is significant that it does not matter – which of these two causes has made tin more scarce. All that the users

of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere and that, in consequence, they must economize tin. There is no need for the great majority of them even to know where the more urgent need has arisen, or in favour of what other needs they ought to husband the supply. If only some of them know directly of the new demand, and switch resources over to it, and if the people who are aware of the new gap thus created in turn fill it from still other sources, the effect will rapidly spread throughout the whole economic system and influence the uses of tin but also those of its substitutes and the substitutes of these substitutes, the supply of all the things made of tin, and their substitutes, and so on".

It is this capacity of the price system, to transmit information from one part of the market to another, in which Hayek and Austrian economists saw (and see) the key contribution of competition to social well-being. Competition is thus not needed to ensure a maximum of wealth in the sense of Pareto optimality, because this is, due to the lack of knowledge, not achievable (HAYEK, 1937). What competition can accomplish is the discovery of possibilities and preferences that no one had hitherto realized. Thus, competition is socially desirable, because it ensures optimal possibilities to activate and use dispersed knowledge and information (MANTZAVINOS, 1994, p. 133). This is why later, HAYEK (1968/94, p. 253) called competition a "*discovery procedure*" that generates "such facts as, without resort to it, would not be known to anyone".

3 COMPETITION AS A DISCOVERY PROCEDURE

To explain in more detail what "competition as a discovery procedure" means, HAYEK (1968/94, p. 249f.; 1990, p. 67f.) refers to other situations in life where competition is used, e.g. in sports or even in science. The aim of competition in these fields is to find out who will do best. It would "apparently be absurd to arrange a competition if we knew in advance who the winner would be" (HAYEK, 1968/94, p. 249). The same holds for the economy. Competition would be unnecessary if the facts to be discovered like "which goods are scarce, or what things are goods, or how scarce and valuable they are," are already known or could be predicted: In each case it is the preliminary outcomes of the market process that inform individuals where it is worthwhile to search... Their attention will be directed by the prices the market offers for various goods and services. This means, "that each individual's particular combination of skills and abilities – which in many regards is always unique – will not only (and not even preliminary) be skills that the person in question can note down in detail or report to a government agency. Rather, the knowledge of which I am speaking consists to a great extent of the ability to detect certain circumstances, an ability that individuals can use effectively only when the market tells them what kind of goods

and services are demanded, and how urgently," (HAYEK, 1968/94, p. 253f.). How any individual will act in detail and what particular circumstances he will encounter is not known beforehand and must be still more unknown to anyone else (HAYEK, 1990, p. 69). When it is thus impossible to know in advance "the facts we wish to discover with the help of competition, we are also unable to determine how effectively competition leads to the discovery of all the relevant circumstances that could have been discovered. All that can be empirically verified is that societies making use of the competition for this purpose realize this outcome to a greater extent than do others..." (HAYEK, 1968/94, p. 250). HAYEK (1990, p. 68) emphasizes that this does not mean that the outcome of competition is necessarily the best imaginable result, though it provides one of the most effective incentives to such an achievement. It will only tell us who did best *on that particular occasion*. HAYEK (1990, p. 66f.) points out that "as a rule there will exist at any one time not only an optimum size of the productive unit, below and above which costs will rise, but also special advantages of skill, location, traditions, etc., which only some but not all enterprises will possess. Frequently, a few enterprises or perhaps only a single one will be able to supply as much of a particular commodity as can be sold at prices covering its costs which may be cheaper than those of any other firm. In this case a few firms (or the single firm) will not be under the necessity of bringing their prices down to the marginal costs, or of producing such a quantity of their product that they can be sold at prices covering its marginal costs. All that their interest will induce the firm to do will be to keep prices below the figure at which new producers would be tempted to enter the market. Within this range such firms (or such a firm) would indeed be free to act as monopolists or oligopolists and to fix their prices (or the quantities of goods produced) at the level which would bring them the highest profits, limited only by the consideration that they must be low enough to keep out others. In all such instances, an omniscient dictator could indeed improve the use of the available resources by requiring the firms to expand production until prices only just covered marginal costs. Using this standard, most markets in the existing world are undoubtedly very imperfect. For all practical problems, however, this standard is wholly irrelevant, because it rests on a comparison with a state that might have been achieved if certain facts which we cannot alter were other than they in fact are".

All that competition can do is to "produce an inducement to do better than the next best, but if the next best is far behind, the range within which the better one will be free to decide how much to exert himself may be very wide. Only if the next best is pressing on his heels and he himself does not know how much better he really is, will he find it necessary to exert himself to the full. All we can hope to secure is a procedure that is on the whole likely to bring about a situation where more of the potentially useful objective facts will be taken into account than would be done in any other procedure which we know. It is the circumstances

which makes so irrelevant for the choice of a desirable policy all evaluation of the results of competition that starts from the assumption that all the relevant facts are known to single mind. The real issue is how we can best assist the optimum utilization of the knowledge, skills and opportunities to acquire knowledge, that are dispersed among hundreds of people, but given nobody in their entirety," (HAYEK, 1990, p. 68). It is therefore meaningless to require any individual "to act 'as if' competition existed, or as if it were more complete than it is," (HAYEK, 1990, p. 69). The standard for judging the performance of competition thus cannot be "the arrangements which would be made by somebody who had complete knowledge of all facts, but the probability which only competition can secure that the different things will be done by those who thereby produce more of what the others want than they would do otherwise," (HAYEK, 1990, p. 67).

4 THE ISSUE OF MARKET POWER IN AUSTRIAN ECONOMICS

These fundamentally different views of the nature and purpose of competition between neoclassical and Austrian economists also have implications on what is considered market power. Proponents of the perfect competition model speak of market power or market imperfections not only when there is a single producer, but whenever a supplier on a certain market is able to sell his product above marginal cost. Since such a deviation is regarded as sub-optimal for allocation and to consumers' well being, they contend that it is desirable for producers to be made to act 'as if' perfect competition existed, i.e., that they should increase production until the marginal costs are equal to price (HAYEK, 1990, p. 70). From the point of view of Austrian economics, this view is problematic for three reasons. Firstly, it underestimates the problem of knowledge faced by an outside supervising authority or economist in determining the deviation. Secondly, it neglects the importance of the self-interest of the producers as a major incentive for their actions. Thirdly, it neglects the dynamics of the market process.

The problem of knowledge in determining the deviation of price from marginal costs consists of the impossibility of objectively determining the individual's cost curves and of knowing what the competitive price is supposed to be (see also HERDZINA, 1993, p. 58; SHOSTAK, 2000). Although mainstream economics often pretends that costs were a "datum," i.e., given knowledge, HAYEK (1990, p. 70) argues that "the lowest costs at which a thing can be produced are exactly what we want competition to discover. They are not necessarily known to anyone but to him who has succeeded in discovering them – and even he will often not be aware what it enables him to produce more cheaply than others can". Consequently, it is also not possible for the observing economist to objectively establish whether a large excess of price over costs, manifesting itself in high profits and due to some improvement in technique or organization, is merely an

adequate return on investment. 'Adequate' in this case must mean a return to the expectation which was sufficient to justify the risk incurred". According to Hayek, the costs contain, to a large extent, the expectations of the producer about probable future developments. The success of the individual producer and his long-run efficiency will therefore depend on how correct his expectations were. Whether the producer that has made an investment should at once extend production to the point where prices will fall to their new marginal costs will thus depend on the judgment regarding the probability of future developments.

Another point closely linked with that is that it is precisely a certain deviation of prices and marginal costs that is sufficient enough to provide not only amortization of the capital sunk in it, but also to compensate for the risk of creating it, which creates the incentive of acquiring information and knowledge on which producers base their investment decision in new production technologies or products. It would be impossible for an outside observer to judge how great the risk was or ought to have appeared (HAYEK, 1990, p. 70). "We cannot at the same time rely on their self-interest to find the most economical method of production and not allow them to produce the kinds and quantities of goods by method which best serve their interest. The inducement to improve the manner of production will thereby often consist in the fact that whoever does so first will thereby gain a temporary profit," (HAYEK, 1990, p. 70). It would wipe out the incentive for any innovation, if, "after the venture had proved successful, the firm were required to reduce prices to what would then appear as its long-run marginal costs. Competitive improvements...rest largely on the endeavor of each to gain temporary monopolistic profits so long as he leads; and it is in a great measure out of such profits that the successful obtain the capital for further improvements," (HAYEK, 1990, p. 71). Also, non-Austrian economists, e.g. FEHL (2002, p. 6) highlight this view and point out that it is exactly this ability of competition to generate innovations that makes the performance of a market economy superior any other thus-far known economic system.

This leads to the third argument against the neoclassical determination of market power – the neglect of competition as a dynamic, rivalrous process. It has been shown that for such a process it is characteristic that the economic agents are constantly trying to outdo their rivals by price cutting, advertising, differentiating their products and introducing new products in order to stay in business (KIRZNER, 1997, p. 70). Once an entrepreneur introduces a new product he inevitably acquires 100 % of the newly-established market. However, in open markets, this market "dominance" is never permanent. As SCHUMPETER (1934/2003) explained, it is these temporary monopolistic profits which attract new entrants (who imitate products) into the market and thus contribute to the diffusion of the innovation. It should be noted that the new entrants do not always simply imitate, but that their imitation often contains, in itself, innovative elements meant to outdo the initial innovator. As a result, a constant competitive process is kept

in motion that will never come to an end in the sense of a competitive equilibrium (FEHL, 2002, p. 12f.). If, against this background, adherents of neoclassical economics who claim the perfect market is a desirable state of affairs, evaluate real world markets and observe a deviation of prices from marginal costs, they can never say at which state of the competitive process they do their analysis, whether it's the beginning or the end of the process or somewhere in between. Therefore, it is also impossible to determine whether detected "monopolistic" profits are the result of a successful realization of an innovation or of an "abuse" of market power because a firm is the single producer (see also HERDZINA, 1993, p. 59).

For Austrian economists, the existence of one single supplier in a market, i.e., of a monopolist, is in general of no economic problem, as long as the reason for the monopolistic position is superior skills or the possession of a rare or unique resource or factor of production (MANTZAVINOS, 1994, p. 129; KIRZNER, 1978, p. 81ff.). It would then "be absurd to punish the possessor for doing better than anyone else by insisting that he should do as well as he can," (HAYEK, 1990, p. 72). Apart from the practical difficulties of ascertaining whether such a *de facto* monopolist does extend his production to the point at which prices will only just cover marginal costs, the requirement for him to do so is rejected, because it would harm two other principles of a free market economy, namely the institution of private property and the freedom of action. "The power to determine the price or the quality of a product at the figure most profitable ... is a necessary consequence of the recognition of private property in particular things, and cannot be eliminated without abandoning the institution of private property. There is in this respect no difference between a manufacturer or merchant who built up a unique organization, or acquired a uniquely suitable site, and a painter who limits his output to what will bring him the largest income," (HAYEK, 1990, p. 72). Concerning freedom of action, HAYEK (1990, p. 72f.) explains: "So long as any producer is in a monopoly position because he can produce at costs lower than anybody else can, and sells at prices which are lower than those which anybody else can sell, that is all we can hope to achieve – even though we can in theory conceive of a better use of resources which, however, we have no way of realizing...Not to do as well as one could, cannot be treated as an offence in a free society in which each is allowed to choose the manner of employing his person and property...We know how to induce such individuals or organizations to serve their fellows better than anyone else can do. But we have no means of always making them serve the public as well as they could".

The most efficient way of inducing a single or few producers to provide good products and services is seen in keeping markets open (HAYEK, 1990, p. 79). Then monopolies or oligopolies will prevail only so long as other producers are unable to meet the demand at prices and qualities that the single or few producers do. Otherwise, new producers would be tempted to enter the market. This has

also been demonstrated by the *Contestable Market Theory* of BAUMOL, PANZAR and WILLIG (1982).

As barriers to entry, Austrian economists interpret only government protection, e.g. tariffs, subsidies, certain legal restrictions in enterprise law, tax and other privileges or regulations in patent law. Economic barriers to entry that are usually set down as imperfectly competitive or even as "monopolistic" in textbooks of mainstream economists (e.g. CLARKE, 1985, p. 71ff.; CARLTON and PERLOFF, 2000, p. 107ff.) because they imply less than perfectly elastic demand curves facing firms, e.g. advertising, product differentiation, predatory pricing, price discrimination or tie-in sales and exclusive-dealing contracts are considered to be legitimate business practices in the competitive process since they are precisely the kinds of entrepreneurial initiative which make up the dynamic competitive process (KIRZNER, 1978, p. 170; 1997, p. 75). The same holds true for competitive advantages that are due to size, such as absolute cost advantages or economies of scale that would require from a newcomer a large amount of capital to enter the market. Freedom of entry would then only be violated if someone could raise the necessary capital and meet other requirements of being able to compete, such as having assembled the necessary management and workers with the necessary skills, and then were forcibly prevented from entering the market by the government. The *freedom* to enter is thus not equal to the *ability* to enter an industry (REISMAN, 2002).

Rather, size and concentration, and thus high capital requirements, are seen as the natural consequence of the competitive struggle. Consequently, size and concentration in themselves are not considered to be of concern. This is also because "neither size in itself, nor ability to determine the prices at which all can buy their product is a measure of their harmful power. More important still, there is no possible measure or standard by which we can decide whether a particular enterprise is too large. Certainly the bare fact that one big firm in a particular industry 'dominates' the market because other firms of the industry will follow its price leadership, is no proof that this position can in fact be improved upon in any way other than by the appearance of an effective competitor – an event which we may hope for, but which we cannot bring about so long as nobody is available who enjoy the same (or other compensating) special advantages as the firm that is now dominant. The most effective size of the individual firm is as much one of the unknowns to be discovered by the market process as the prices, quantities or qualities of goods to be produced and sold. There can be no general rule about what is the desirable size since this will depend on the ever-changing technological and economic conditions; and there will always be many changes which will give advantage to enterprises of what on past standards will appear to be an excessive size," (HAYEK, 1990, p. 77f.).

5 IMPLICATIONS FOR ANTITRUST POLICY

The different views of market power lead to different implications for antitrust policy. As mentioned in the introduction, if one would strictly follow the perfect competition model, then anytime a real situation in a market deviated from this model, it would be recommended that the government intervene in order to improve allocation efficiency and consumers well-being. Even as early as the 1920s and 1930s such an approach was considered unrealistic. This caused the so-called price theoretical revolution, linked to names like PIERO SRAFFA (1926), JOAN ROBINSON (1933) and EDWARD H. CHAMBERLIN (1933) who tried to find a more realistic alternative to the perfect competition model by introducing "imperfection" such as product heterogeneity or advertising into their models. This led to the development of models of "monopolistic competition" and the concept of "workable competition" for practical competition policy. The latter is based on the works of Edwards S. Mason, John Maurice Clark and Joe S. Bain and often summarized under the term "*Harvard School*". Nevertheless, the model of perfect competition remained the benchmark economic theory and policy strove for ("first-best-solution"), though they were aware that it is in practice not achievable. So they were looking for imperfections that were tolerable to keep competition at least "working" and were about to bring second-best results compared to the ideal of perfect competition (ABERLE, 1992, p. 29ff.; MANTZAVINOS, 1994, p. 21ff.). Economists then elaborated criteria with which to assess the workability of competition. However, these criteria often differed considerably from author to author, which led MASON (1959, p. 381) to state: "There are as many definitions of 'effective' or 'workable' competition as there are effective or working economists."

In contrast, Austrian economists do not see much necessity for special antitrust policy. Rather, competition issues are mainly to be solved within the framework of general economic policy. The main task of the economic policy is seen as setting up and protecting a functioning framework of rules, i.e., of institutions for the market economy that guarantee the freedom of everybody to act according to his own personal goals. Hayek developed three requirements that these rules or institution must meet: (1) The rules shall consist only of prohibitions and not of orders to act in a certain way, because only then is the discovery and use of new knowledge and ways of acting assured (HAYEK, 1991, p. 183). (2) These rules must be general, i.e., there must be no exemptions, but the rules must apply to an unknown and indefinite number of persons and cases (HAYEK, 1986, p. 73). (3) The rules must be valid for a long time, so that the economic agents can build stable expectations (HAYEK, 1986, p. 270f.). For competition issues, these requirements imply that certain behaviors or actions not considered to be in line with economic freedom shall *per se* be forbidden, or more precisely: Shall be declared as invalid from the very beginning and not be capable of being sued for in court. This holds, according to HAYEK (1990, p. 86) particularly for cartels

and collusions set up to prevent competition. In addition, there should be no privileges for any enterprise in the form of tax breaks or exemptions from the general prohibition of cartels and collusion. In reality, however, this is often the case, especially in German antitrust law, which is full of exceptions to the rule.³ Abolishing such privileges and other regulations contributes to the fulfillment of the basic requirements of Austrian economists in inducing and ensuring dynamic competition: Guaranteeing free entrepreneurial entry into any market where profit opportunities may be perceived to exist, since only government regulations are seen as harmful barriers to entry (KIRZNER, 1997, p. 74). Limiting the size of firms, for example by obstructing mergers, is also regarded as blocking entrepreneurial entry and thus as *anti-competitive* (KIRZNER, 1997, p. 75).

Concerning size and concentration, HAYEK (1990, p.78ff.) does not deny that great size can be harmful in that it might confer power on its management which it can use to exercise influence on the government, and that the advantages of size do not always depend on facts which cannot be altered, "such as the scarcity of certain kinds of talents or resources (including such accidental and yet unavoidable facts as that somebody has been earlier in the field and therefore has had more time to acquire experience and special knowledge); they will often be determined by institutional arrangements which happen to give an advantage to size which is artificial in the sense that it does not secure smaller social costs of the unit of output. In so far as tax legislation, the law of corporations, or the greater influence on the administrative machinery of government, give to the larger unit differential advantages which are not based on genuine superiority of performance, there is indeed every reason for altering the framework as to remove such artificial advantages of bigness. But there is as little justification for discrimination by policy against large size as such as there is for assisting it," (HAYEK, 1990, p. 78).

As a result, Austrian economists are opposed to the antitrust policy that has been, and still is, widely practiced in many western market economies. In the USA, and also in Germany, competition policy has long been dominated⁴ by the ideas of the "Harvard School," which thus still sees the ideal degree of competition as represented by the perfectly competitive model (FEHL and SCHREITER, 1997, p. 231). This was reflected in a rather strict attitude towards business practices like

³ In Germany, nearly 50 % of all economic activities are estimated to be exempt from the antitrust law - among them agriculture (FEHL and SCHREITER, 1997, p. 234).

⁴ In the USA, this dominance was interrupted with the presidency of Ronald Reagan. Not only competition policy, but the entire economic policy was influenced by the Chicago School. Some of its main representatives are George Stigler, Robert Bork, Harald Demsetz and Richard A. Posner. Although they used neoclassical research methodologies, their view on competition and competition policy was almost identical to the Austrian school (PAQUE, 1985; MANTZAVINOS, 1994, p. 42f.). Under George Bush senior, mainstream economists regained some influence (ABERLE, 1992, p. 145ff.; SCHMIDT, 2001, p. 250f.).

"predatory pricing" or price discrimination and especially to mergers of any kind. Since the benchmark of the perfect competition model demands "many" small firms in "unconcentrated industries," each producing a homogenous product and charging the same price, the mentioned business practices and the reduction of the number of market participant are seen as harmful.

In contrast, Austrian economists see in such an antitrust policy a tool to shield smaller and less efficient businesses from their larger competitors (DILORENZO, 1991, p. 2; DILORENZO, 2001; REISMAN, 2002). DILORENZO (1991) shows, in an analysis of the historical development of antitrust legislation in the USA (with an emphasis on the time of the introduction of the Sherman Act in 1890) that there is in fact no evidence, in the industries that were sued for being monopolized by trusts, that output fell and prices rose, but exactly the opposite happened. Many lawsuits were initiated by relatively small but politically active firms, not seldom farmers, who sought protection from larger competitors (DILORENZO, 1991, p. 3). But although falling prices should be seen beneficial for consumers' well-being, this in turn often raises the complaint of predatory pricing, that is, pricing below costs meant to drive out competitors. In Germany, such business practices have been, under certain circumstances⁵, forbidden since 1999 (AGRA-EUROPE, 31/00, 31. Juli 2000; LÄNDERBERICHTE, 1+2). But as DILORENZO (1991, p. 5) shows, there has yet to be found an example of a real world monopoly created by predatory pricing. Indeed, what rational businessman would continue to price below cost for a long period? Also, OBERENDER (1989, p. 320) supports this view and criticizes the prohibition of pricing below costs as the setting of an artificially low boundary, which serves only to protect inefficient competitors.

Austrian economists have a similar view of the well-known antitrust case against Microsoft. The US Justice Department's demand that Microsoft separate its browser from Windows 98 is seen as an attempt by Microsoft's competitors to cripple a rival who is providing superior products and service. It is especially seen as a step toward destroying product differentiation and enforcing homogeneity in accordance with the perfect competition model. It is argued that by combining its browser with Windows 98, Microsoft offered a new product to consumers. If a consumer were to become dissatisfied with Microsoft's browser, he always has the option of using browsers offered by other suppliers. Consequently, it is consumers who must be allowed to express their judgment, and not government officials (DILORENZO, 2001; REISMAN, 2002). In addition to the

⁵ The prohibition to sell under costs refers "only" to enterprises with "market power" and to enterprises that not only occasionally, but constantly use predatory pricing, and where this has no "objective" justification (AGRA-EUROPE, 31. Juli 2000; LÄNDERBERICHTE; 1+2). These are very vague conditions, which open much space for discretionary interference of antitrust agencies.

well-know arguments, mainstream economists argue in favor of the breakup of Microsoft with a new theory of so-called "market failures" – the theory of networks effects (see also ERLEI and SIEMER, 2002). Network effects arise whenever the value of a good to a consumer heavily depends on the number of other consumers that use the good. Therefore, the more consumers who use computers with email or fax capabilities, the more valuable it becomes to have a computer with such capabilities. It is argued that these increasing returns (advantages) to consumers tend to "lock in" some initial technological innovation as a kind of industry standard (and "lock out" would-be competitors) and create a fatal "path dependence" that ultimately can lead to (inefficient) monopoly for first-mover firms. Austrian economists admit that network effects can exist and can be important to consumers, and that they may even lead to high market shares in certain circumstances. However, the *process* of achieving the high market share outcome is regarded as both competitive and efficient and usually does not represent any market failure (LIEBOWITZ and MARGOLIS, 1999, p. 14f.). The competitive process means that any monopoly is, ultimately, unstable and that newer, more efficient innovations will break through, leading to some new monopoly. LIEBOWITZ and MARGOLIS (1999, p. 15) call industries with such network effects serial monopolies. "The new entrant seeks not to coexist with the incumbent, but rather to replace it. ...the rivalry that they create, is apparently sufficient discipline to hold monopoly price in check and to keep the rate of innovation very rapid".

Besides the argument that market power is never persistent if competition is viewed as a open market process, practiced antitrust policy is also rejected because of the discretionary power it gives government agencies, so that situations arise where government "tells some businessmen that they must not cut prices, others that they must not raise prices, and still others that there is something evil in similar prices," (HAYEK, 1990, p. 86).

6 CONCLUDING REMARKS

The paper tried to highlight the view of Hayek and the Austrian School of Economics on competition, market power and antimonopoly policy in contrast to the widely-used mainstream economics model of perfect competition. The aim was not to deny the usefulness of neoclassical research and methodology in the field of positive analysis of price formation. Instead, the aim was to plead for a cautious application of its research methodology and results for normative conclusions, especially in assessing the performance of competition. In addition, the aim of paper was to show that in economics, there is in fact no unanimous agreement on how to assess competition. Whereas neoclassical economists view competition as "perfectly" functioning when prices equal marginal cost and focus on

competition as a means of achieving maximum wealth in the sense of Pareto optimality (achieved in the so called "competitive equilibrium") for the Austrian school, competition means a dynamic, rivalrous process, whose desirability stems from its ability to be a discovery procedure. In addition, the concept of perfect competition is rejected on the grounds of what HAYEK (1974/96) called the "pretence of knowledge," i.e., the assumption that facts are given, which in reality are just what competition has to discover, and the pretence of knowing what the optimal size or market structure should be. As a result, different implications for antimonopoly policy are drawn. Adherents of the perfect market model are convinced that antitrust regulations are needed to force the markets in the direction of their idealized model of "perfect" competition. But Hayek and other Austrian economists oppose such regulations on the ground that this would be inherently incompatible with rivalry. The best way to secure competition is seen as keeping markets open through the removal of government-created barriers to competitive entry.

In the agro-food sector of Central and Eastern European countries, market power is often of major concern. It is claimed that the up- and downstream sectors have and abuse market power vis-à-vis farmers. In Russia, it is thereby often referred to the development of prices, i.e., that farm-gate prices rise slower than prices for means of productions and that the number of firms in these sectors is less than in agriculture. It follows that clear cut advice on what to do depends on what school of economic thought decision-makers adhere to. If one sees competition as a means to achieve a certain goal, e.g. Pareto-optimality, one would call for corresponding government interventions. If, like Austrian economists, one sees no specific task for competition to achieve save that of being a discovery process, one would have to check whether there are government regulations that create and protect market power and hamper market entry. In Russia, the emergence of large conglomerates in the agro-food sector in the form of agrohholdings can be attributed to missing or ill-functioning institutions, but also to political support, especially in the Belgorod and Orel Oblast (HOCKMANN, WANDEL and SHAIKIN, 2003, p. 1246ff.). It is feared that large agrohholdings may become a threat to competition. Although it cannot be excluded that some of these big conglomerates dominate markets, in the Austrian view this would be of no concern, since open markets constantly menace these positions. In fact, recent developments where some big agrohholdings suffered losses and started to sell off plants illustrates that competition in the Hayekian sense of a dynamic process and as a discovery procedure seems to be at work in Russia, too (see e.g. KOSTINA, 2003; SAGDIEV, 2003).

Which theoretical concept of competition decision-makers in Central and Eastern Europe adhere to must be decided by the societies themselves through the political process. Often, the decision will also depend on the (moral) values that are

regarded as being important. The only thing economists can do is to show the advantages and disadvantages of different concepts.

REFERENCES

- ABERLE, G. (1992): *Wettbewerbstheorie und Wettbewerbspolitik*, 2., überarb. Aufl., Stuttgart, Berlin, Köln.
- AZZAM, A. (1992): Testing the competitiveness of food price spreads, *Journal of Agricultural Economics*, Vol. 43, Nr. 2, pp. 248-256.
- BAUMOL, W. J., PANZAR, J., WILLIG, R. (1982): *Contestable markets and the theory of industry structure*, New York.
- CARLTON, D. W., PERLOFF, J. M. (2000): *Modern industrial organization*, 3. Aufl., Reading (Mass.).
- CHAMBERLIN, E. H. (1933): *The Theory of monopolistic competition*, Mass, Cambridge.
- CLARKE, R. (1985): *Industrial economics*, Oxford.
- DEMSETZ, H. (1969): Information and efficiency: Another viewpoint, *Journal of Law and Economics*, Vol. 12, No. 1, pp. 1-22.
- DILORENZO, T. J. (1991): The antitrust economists' paradox, *Austrian Economics Newsletter*, Summer, <<http://www.mises.org/journals/scholar/DiLorenzo.PDF>>.
- DILORENZO, T. J. (2001): The microsoft conspiracy, *The Free Market*, Vol. 19, Nr. 3, <http://www.mises.org/freemarket_detail.asp?control=346&sortorder=articledate>.
- ERLEI, M., SIEMER, J. P. (2002): Vereinigte Staaten vs. Microsoft: Missbrauch von Marktmacht oder dynamischer Wettbewerb?, *Das Wirtschaftsstudium (WISU)*, Vol. 31, No. 11, pp. 1445-1452.
- FEHL, U. (2002): Ein Plädoyer für mehr Wettbewerb im russischen Transformationsprozeß, in: FEHL, U., SCHÜLLER, A. (eds.): *Wettbewerb und weltwirtschaftliche Integration: Triebkräfte des Transformationsprozesses*, *Studien zur Ordnungsökonomik*, No. 28, Marburger Gesellschaft für Ordnungsfragen der Wirtschaft, Stuttgart, pp. 1-14.
- FEHL, U., SCHREITER, C. (1997): Ordnungspolitische Kurswechsel in der Wettbewerbspolitik, *ORDO, Jahrbuch für die Ordnung von Wirtschaft und Gesellschaft*, Vol. 48, pp. 219-239.
- HAYEK, F. A. VON (1937): Economics and Knowledge, *Economica*, Vol. 4, pp. 33-54, <<http://www.virtualschool.edu/mon/Economics/HayekEconomicsAndKnowledge.html>>.
- HAYEK, F. A. VON (1945): The use of knowledge in society, reprinted in: HAYEK, F. A. (1980): *Individualism and Economic Order*, Chicago, London, pp. 77-91.
- HAYEK, F. A. VON (1948): The meaning of competition, in: HAYEK, F. A. (1980): *Individualism and Economic Order*, Chicago, London, pp. 92-106.
- HAYEK, F. A. VON (1968/94): Der Wettbewerb als Entdeckungsverfahren, in: HAYEK, F. A. VON (ed.): *Freiburger Studien*, 2. Aufl., Tübingen, 1994, pp. 249-265.
- HAYEK, F. A. VON (1974/96): Die Anmaßung von Wissen, in: KERBER, W. (ed.): *Die Anmaßung von Wissen*. Neue Freiburger Studien, Tübingen, 1996, pp. 16-36.

- HAYEK, F. A. VON (1986): *Recht, Gesetzgebung und Freiheit*, Vol. 1: Regeln und Ordnung, 2. Aufl., Landsberg a.L., München.
- HAYEK, F. A. VON (1990): *Law, legislation and liberty*, Vol. 3: The political order of a free people, Chicago.
- HAYEK, F. A. VON (1991): *Die Verfassung der Freiheit*, 7. Aufl., Tübingen.
- HERDZINA, K. (1993): *Wettbewerbspolitik*, 4. Aufl., Stuttgart.
- HOCKMANN, H., WANDEL, J., SHAIKIN, V. V. (2003): Integrated structures in the Russian agro-food sector, in: FACULTY OF ECONOMICS, SPLIT (ed.): *Enterprises in Transition: Proceedings, Fifth International Conference on Enterprise in Transition, Split-Tučepi, 22.-24.05.2003*, pp. 1234-1254.
- KIRZNER, I. M. (1978): *Wettbewerb und Unternehmertum*, Tübingen.
- KIRZNER, I. M. (1997): Entrepreneurial discovery and the competitive market process: An Austrian approach, *Journal of Economic Literature*, Vol. XXV (March), pp. 60-85.
- KNIGHT, F. H. (1921): *Risk, uncertainty and profit*, Boston, New York.
- KOSTINA, G. (2003): Lovuška dlja kapitala [A trap for capital], *Ekspert*, 10.02.2003, <<http://www.agronews.ru/Obzor.php?ObzorId=353>>.
- LIEBOWITZ, S. J., MARGOLIS, S. E. (1999): *Winners, losers, and Microsoft: Competition and antitrust in high technology*, Oakland.
- MASON, E. S. (1959): The new competition, in: MASON, E. S. (ed.): *Economic Concentration and the Monopoly Problem*, Mass, Cambridge.
- MANTZAVINOS, CH. (1994): *Wettbewerbstheorie. Eine kritische Auseinandersetzung*, Berlin.
- MCCORRISTON, S. (1997): Price transmission in vertically-related markets under imperfect competition, *Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e.V.*, Vol. 33, pp. 59-68.
- MÖSCHEL, W. (1984): Antitrust and economic analysis of law, *Zeitschrift für die gesamte Staatswissenschaft [Journal of Institutional and Theoretical Economics]*, Vol. 140, pp. 156-171.
- OBERENDER, P. (1989): Lebensmittelhandel, in: OBERENDER, P. (ed.): *Marktökonomie. Marktstruktur und Wettbewerb in ausgewählten Branchen der Bundesrepublik Deutschland*, München, pp. 299-325.
- PAQUÉ, K.-H. (1985): How far is Vienna from Chicago?, *Kyklos*, Vol. 38, Fasc., pp. 412-434.
- PIES, I. (1996): Theoretische Grundlagen demokratischer Wirtschafts- und Gesellschaftspolitik – Der Beitrag James Buchanans, in: PIES, I., LESCHKE, M. (ed.): *James Buchanans konstitutionelle Ökonomik*, Tübingen, pp. 1-18.
- REISMAN, G. (2002): Understanding barriers to entry, *The Free Market*, Vol. 20, Nr. 1, <http://www.mises.org/freemarket_detail.asp?control=384&sortorder=articledate>.
- RICKETTS, M. (2002): *The economics of business enterprise*, Cheltenham, Northampton.
- ROBINSON, J. (1933): *The Economics of imperfect competition*, London.
- SAGDIEV, R. (2003): "Gazprom" rasprodaet kolchozy ["Gazprom" sells off kolhozes], *Krest'janskije vedomosti*, 04.04.2003, <www.vedomosti.ru>.

- SCHMIDT, I. (2001): Wettbewerbspolitik und Kartellrecht. Eine Einführung, 7., neu bearb. Aufl., Stuttgart.
- SCHROETER, J. R. (1988): Estimating the degree of market power in the beef packing industry, *The Review of Economics and Statistics*, Vol. 70, Nr. 1, pp. 158-162.
- SCHUMPETER, J. A. (1934/2003): The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle, 9th print, Mass, Cambridge.
- SHOSTAK, F. (2000): Judge Jackson's bad economics, *Ludwig von Mises Institute, Daliy Articles*, June 8, <<http://www.mises.org/fullstory.aspx?Id=441>>.
- SRAFFA, P. (1926): The laws of returns under competitive conditions, *The Economic Journal*, Vol. 36, pp. 535-550.
- STREIT, M. E. (2000): Theorie der Wirtschaftspolitik, 5. Aufl., Düsseldorf.

AN EX-ANTE ANALYSIS OF A MINIMUM PRICE SYSTEM FOR UKRAINE

OLEG NIVYEVSKIY¹, ARNIM KUHN²

ABSTRACT

Ukrainian agricultural markets have been characterised by occasional instability throughout the last decade, which has further reinforced the widespread conviction that market mechanisms do not lead to satisfactory results in the agro-food sector. Such mistrust of the ‘invisible hand’ has led to repeated attempts to stabilise prices and support farm incomes through various market interventions, most of which, however, remain ineffective. In the aftermath of the severe winterkill of 2003, which reduced the wheat harvest to one third of its average volume, a concerted effort was made to get domestic agricultural prices under public control. The major policy tool for achieving this goal was the introduction of minimum prices coupled with extensive intervention purchases for the most important agricultural commodities. In this paper we investigate possible consequences of the introduction of floor prices in Ukrainian agriculture and the food sector on production, producer incomes, domestic market prices, trade, and overall welfare. The quantitative portion of the analysis is carried out with the Regional Agricultural Sector Model of Ukraine (RASMU). This model aims to analyse the consequences of different policy actions in the field of agriculture and the processing industry. Our simulation results clearly show that the use of minimum prices is incompatible with Ukraine’s position as a net exporter of agricultural commodities and its aspirations to join the WTO, and that such an intervention system would inflict a considerable burden on consumers and the state budget.

¹ Institute for Economic Research and Policy Consulting, Kyiv, Ukraine,
E-mail: nivjevskiy@ier.kiev.ua.

² Institute for Agricultural Policy, Bonn, Germany, E-mail: kuhn@agp.uni-bonn.de.

1 INTRODUCTION

The 'invisible hand' is working in Ukraine, but weak market integration is curtailing much of its beneficial potential. More specifically, huge trade costs, combined with volatile harvests, resulted in wide producer price fluctuations throughout the previous decade. But instead of addressing the problem directly by improving agricultural productivity and reducing the transaction costs of trade, the government of Ukraine (GOU) has repeatedly tried to achieve stability through either direct interventions or the establishment of target prices. Direct intervention usually came in the form of excessive monitoring and control of commodity movements, both inter-regionally and through the processing chain. A recent attempt to guarantee a certain producer price level for grain was made in the form of a pledge price system intended to ease the downward pressure on farm gate prices during the harvest period. But while price guarantees have been largely ineffective for lack of funding through the GOU, the command-style direct interventions – particularly enforced sales to publicly-owned elevators and price controls – have led to mistrust of authorities and policymakers. In the aftermath of the severe winterkill of 2003, which reduced the wheat harvest to one-third of its average volume, another concerted effort was launched to get domestic agricultural prices under public control. The major policy tool for achieving this goal was the introduction of minimum prices, coupled with extensive intervention purchases, for the most important agricultural commodities.³ The GOU seems to be determined to introduce this minimum price system, which is supported by the fact that UAH 335m (USD 63m) has been earmarked for this purpose in the draft state budget for 2005. The question, however, is whether the introduction of such measures would be sustainable in fiscal, economic and legal terms.

A minimum price system has proved to be unsustainable in European agriculture, especially as it became incompatible with WTO standards, i.e., lost its legal foundation (CRAMON, 2004). But the budgetary impact of ever-increasing spending on intervention and export subsidies also contributed to the factual replacement of the minimum price by direct income support. On the other hand, the economic losses in the form of increased consumer prices have played only a minor role. In the case of Ukraine, both the fiscal *and* economic affordability of such an intervention system is important, as Ukraine's GDP per capita (roughly USD 5,240 at PPP in 2003) is that of a developing country comparable to China, which leaves much less room for implicitly taxing consumers. In this paper we investigate possible consequences of minimum prices on agricultural production, producer incomes, domestic market prices, trade, and overall welfare. In section two we briefly recall the most important economic aspects of minimum

³ Ukrainian Law № 507-XII "On prices and pricing" (Article 9).

price regimes. Section three is devoted to a quantitative analysis carried out with a regional agricultural sector model for Ukraine, and section four concludes the article with a discussion of alternative solutions for the volatility of Ukraine's agricultural markets.

2 ECONOMIC CONSEQUENCES OF A MINIMUM PRICE REGIME

This chapter highlights the basic economic, institutional, and legal consequences of a minimum price regime. First, we qualify the impact of a minimum price regime on several groups of economic agents by means of a partial market model: i) consumers, ii) taxpayers, iii) landowners, iv) farm households/producers, and v) input suppliers and resource owners. Then we discuss the additional costs of the program and finish the chapter with WTO-relevant aspects of the issue.

2.1 Market effects of minimum price regime

In the following we carry out a conventional welfare analysis of floor prices for grain in Ukraine. On the supply side, the market consists of more than 10,000 agricultural enterprises, which in 2004 produced about 42 Million tons of grain, including 16.5 Million tons of wheat. This harvest amount is far beyond the domestic needs of the country, which makes grain exports necessary during the course of the marketing year. Moreover, most grain producers suffer from limited on-farm storage capacity and are therefore forced to sell immediately after harvest at low prices, or store their grain in elevators run by large companies that often have some degree of regional monopolistic power. Consequently, these elevator companies are able to charge fees above their marginal costs from producers and traders, thereby increasing the marketing costs of grain. These stylised facts hold true in most years⁴ and serve as a justification for policy makers to implement support price programs, as, for example, the minimum price regime envisaged.

To illustrate how a price support program affects the situation on a market, consider the model of a grain market as shown in Figure 1. The minimum price regime affects market demand and supply by raising the domestic price level as shown in Figure 1. Introducing the floor (minimum) price causes total demand DD_C to become perfectly elastic at the support level P_M , since the government is (theoretically) ready to buy unlimited amounts of grain to defend this price level. Total demand then becomes DD_G . In the short run, total supply S_s (inelastic in the short run), is represented by a vertical line.

⁴ Only when harvest failures occur does the country slide back into grain autarky, such as in the year 2003, when approximately 4 Million tons of grain had to be imported.

In a period following a below-average harvest, characterized by a low market supply S_S^* , the market price P_D^* exceeds the support price level, rendering

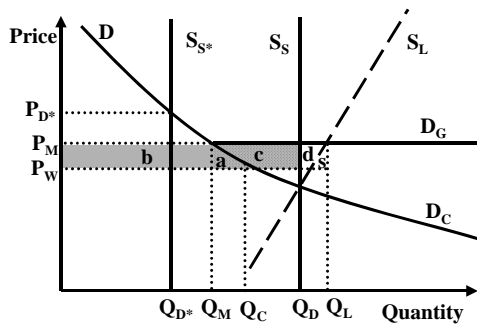


Figure 1: Commodity Market

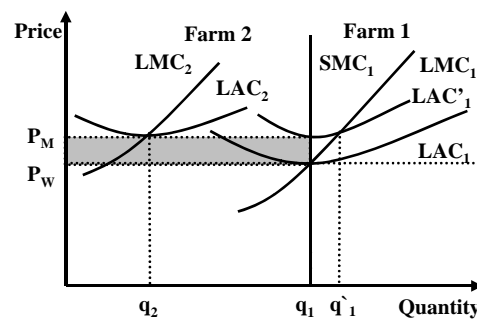


Figure 2: Representative Firms

government intervention purchases obsolete. On the other hand, after a bumper crop (see S_S), as in 2004, the government needs to procure the necessary amount ($Q_D - Q_M$) to prevent competitive forces from driving prices below the floor price. The associated reduction in consumption is ($Q_C - Q_M$), since in a net export situation under free market conditions, domestic consumers will consume the amount Q_C . Consequently, consumers incur welfare losses represented by the areas marked b and a (reduction in consumer surplus). The induced costs for taxpayers, needed to pay for government purchases, equal the rectangle with base ($Q_D - Q_M$) and height ($P_M - P_W$). Thus, if the government intends to raise the domestic price above the world price parity level, it needs to buy from the market even more of the amount that would have been exported at P_W , i.e. ($Q_D - Q_C$). Moreover, if the support price were raised above the c.i.f. price level (i.e., world market price plus trade costs: Tariffs, transport, marketing costs), imports would occur at this price in almost unlimited quantities and prevent the government from achieving its price goals (see Section 2.3 for further discussion). On the other hand, due to the increased price level, producers gain the area represented by ($b + a + c + d$). Nevertheless, for all groups together, there is a net loss equal to the triangle a .

The above analysis, however, applies only to a short-run perspective. In the long run the supply response to a change in the domestic price is larger, as supply will become price-responsive. The important thing here is that the number of farms and some of the factors of production are fixed in the short run (e.g. capital), but variable in the long run. The increase in price means that firms, on average, will make super-normal or excessive profits, represented by the shaded rectangle in Figure 2. The presence of super-normal profits attracts new firms with higher long-run average and marginal costs (LAC and LMC curves respectively, e.g., farm 2) to enter the industry, while existing firms invest in expanding their output. As a result, the short-run supply curve turns outward, causing the long-run supply curve to be inclined to the right (S_L curve on Figure 1). Production expands towards the level Q_L . In this case, the corresponding long-run net loss is larger by area s . As new farms enter, and existing farms expand grain production,

there will be increased demand for the scarce resources needed for producing grain: Equipment, land, fertilizers, etc. Increased demand for these inputs will raise the long-run marginal and average costs of producing grain to LMC_1 and LAC'_1 (see Figure 2), which drives economic profits for the average producer in the industry down to zero again. Since the firms do not earn any super-normal profits in the long run, the entire long-run increase in producer surplus is shifted back to inputs or production factors such as land or capital. The increased demand for inputs tends to raise input prices and permits suppliers of these inputs to earn greater profits than they would in the absence of a price support program. Thus, the producer surplus is partly distributed further on in the form of higher rents on fixed factors (e.g. land, entitlements, etc.). The distribution of these rents depends on the elasticity of factor supply and substitution, as well as on the relative importance of the factor in crop production (GARDNER, 1987).

As a consequence of this, minimum price regimes or market price support (according to OECD analysis) were shown to be the least efficient policy instruments for increasing producer incomes. For example, only roughly 40 % of price support payments end up in farmers' or land owners' pockets. The remaining 60 % of payments end up either in the hands of input suppliers or as administrative and other costs. (CRAMON, 2004).

It is possible to extend this conventional static equilibrium analysis by employing a dynamic perspective. For instance, MIRANDA and HELMBERGER (1988) have examined a rational expectation model of the U.S. soybean market in which the government attempts to stabilise price through open market purchases and sales. The authors show that although price support programs raise market prices in the short run, they can also reduce prices in the long run under certain conditions, thereby questioning the suitability of such a program. Moreover, although price programs can substantially stabilize prices, they can also serve to destabilise producer revenues, particularly when harvests are volatile.

On the demand side, minimum producer prices will most likely result in increased consumer prices, making the poorest layers of the population suffer most. Since such a situation might be politically unacceptable, the GOU may seek to control retail prices, requiring the restoration of administrative controls (limits on mark-ups) or additional budgetary spending (subsidies to the grain-processing sector). Given that Ukraine has a competitive processing sector all the way down to the retail bakery shops, any artificial restrictions on processing margins will not work, as, under competition, these margins will not be significantly above zero.

That ultimately means that the GOU would have to start using consumer subsidies in order not to reduce the activity of the processors. Let us consider the downstream sector and welfare consequences of a minimum price regime and consumer subsidies simultaneously used. As discussed above, the minimum

price regime inflicts additional costs on the operation of the downstream sector in terms of higher inputs costs, shifting the supply curve S_0 inward to S_1 (Figure 3). As a consequence, consumers face a higher price P^* . In order to compensate consumers, the government introduces an *ad valorem* subsidy sufficient to restore the pre-program level of consumption Q , shifting the demand curve from D_0 to D_1 .

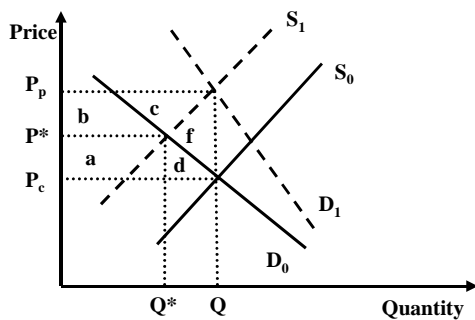


Figure 3: Consumer subsidy impact

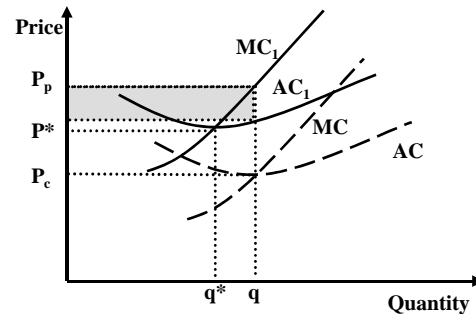


Figure 4: Representative firm

Thus, producers receive price P_p and consumers the pre-program price P_c . In order to pay enough subsidies to restore the initial level of consumption Q , the GOU needs to use budgetary funds represented by the area $(a+b+c+d+f)$ in Figure 3. Figure 4 shows that increased input prices drive up the marginal and average cost curves of the downstream sector enterprise to the new equilibrium (P^*, q^*) . The consumer subsidy would allow the representative enterprise of the downstream sector to earn additional profits (shaded area in Figure 4). Although producers and consumers gain areas $(b+c)$ and $(a+d)$, respectively, the whole economy ends up with a net welfare loss (area f) in addition to the net welfare losses from the minimum price regime as shown in Figure 1. The magnitude of these losses, of course, depends on the elasticities of supply and demand functions. Nonetheless, a very important implication can be drawn from this analysis. Since every point on the demand curve shows how much people value that particular level of consumption, the subsidy simply induces them to consume goods that are priced below their resource cost. It would be more efficient to hand out a direct grant to consumers (i.e., the area $a+d$ in Figure 3), allowing budgetary funds to be used for other purposes and fully compensating consumers.

2.2 Institutional effects

There are additional effects deriving from minimum prices which have to be taken into consideration when assessing the costs of such a policy programme. Minimum prices also weaken the incentives of producers to improve their production efficiency and reduce costs, thus spoiling the industry's international competitiveness. As Figure 2 demonstrates, the minimum price creates rents (shadowed area in Figure 2 or 4) for some low-cost producers (e.g. Farm 1),

which creates incentives to lobby policy makers to maintain the support measures. So once Ukraine has implemented such a minimum price regime, it will probably take a long time to abandon it again, inflicting a significant burden on consumers and taxpayers. This is exactly what has happened in the European Union: It is politically very difficult to drive down a level of economic support for agriculture or other beneficiaries once such a measure has been in place for some time.

Moreover, measures for administrating the program and its associated costs constitute an additional burden for taxpayers. First of all, this concerns the administrative body that carries out the procurement and storage of purchased commodities. The government (or basically taxpayers) incurs significant expenditures for the staff salaries of that body, and for commodity handling and maintaining storage facilities, etc. Also, one should not underestimate the costs derived from the perish of stored grain, which adds to the overall costs.

2.3 Legal aspects

Due to its substantial trade distortion effects, market price support is becoming increasingly controversial under multilateral trade agreements, and, above all, within the WTO (accession to which Ukraine is currently pursuing). Driving prices above the world level is not a feasible option for agricultural policy, as this requires the use of export subsidies in the case of a surplus producer such as Ukraine. Since export subsidies are explicitly not allowed under WTO rules, Ukraine will face considerable constraints selling its minimum price program to its trade competitors, which are counterparts in the WTO accession negotiations (OECD, 2004). The inevitable countervailing measures would negatively influence the competitiveness of Ukraine's exports and would thwart Ukraine's long-term goal of becoming a powerful agro-food exporter.

Furthermore, a minimum price regime might be ineffective without corresponding import barriers. If the minimum price is set above the c.i.f. - import parity price, an import tariff (either prohibitively high or flexible) has to prevent imports from entering the domestic market. As the level of import protection is monitored by the WTO, Ukraine could run into trouble with WTO partners were it to introduce a floor price regime.

3 ENUMERATION OF THE ECONOMIC IMPACTS OF MINIMUM PRICES

This chapter undertakes a quantitative analysis of a minimum price regime on Ukraine's agricultural markets. First, we describe the basic features of the simulation model RASMU (Regionalized Agriculture Structural Model of Ukraine) which was used for the analysis. Second, we explain how the minimum price regime was incorporated into the model. Then we define our simulation setup, and finally, present the results of simulations.

3.1 Data and modelling framework

The RASMU model allows for the analysis of the consequences of various existing and planned policy actions in the field of agriculture and the processing industry within a simplified and consistent framework of quantities and prices.⁵

To begin with, the model distinguishes between Ukrainian oblasts, so it allows for the capture of the diverse agro-ecological conditions in Ukraine, and thereby determines where certain policy measures have the greatest effect. For the sake of simplicity, four aggregate regions (West, North, Central, and South), composed of neighbouring oblasts with similar agro-ecological conditions, have been identified, and these four representative regions trade among each other and the rest of the world. When looking at similar modelling approaches (e.g. PUSTOVIT, 2003), the major difference of RASMU is the treatment of trade. On the one hand, RASMU has no differentiated treatment of the world outside Ukraine, while Pustovit's model distinguishes trade relations with the EU and other major trade partners. On the other hand, Pustovit's model treats Ukraine as one singular market, while RASMU allows for regionally differentiated analyses within Ukraine.

RASMU is a partial equilibrium model, operating only with agricultural product and input markets. It comprises 27 commodities: Raw commodities (wheat, barley, rye, maize, oats, buckwheat, potatoes, sunflower seed, sugar beets, pulses, cow's milk, beef cattle, pigs, poultry, hens) and processed commodities (bread products, maize flour, processed buckwheat, sunflower oil, sugar, butter, cheese, other milk products, beef, pork, poultry meat, eggs), whose production, consumption, and trade are modelled. Although such a framework may not completely account for some macroeconomic repercussions, it simplifies the data management process and equation system.

The model is comparative-static in nature, meaning that it is not a multi-period dynamic model producing future forecasts. Nevertheless, development in Ukrainian agriculture has been too volatile during the past decade to derive appropriate trend parameters, making the model results satisfactory for the time being.

To assess the effectiveness of policy measures, RASMU employs an aggregate welfare calculation, which includes four elements: Producer surplus, feed user surplus, consumer surplus and the balance of the government budget. The interregional and foreign trade relations in RASMU are represented as net trade flows. The idea of this mechanism is simple: If the target region has excess supply, it exports the commodity to those regions where the price difference (minus trade costs) is highest. The trade flows provide for the relative equalisation

⁵ For a detailed description of the RASMU model see KUHN, 2004.

of commodity prices between the regions and the world market. Trade costs, in turn, comprise handling and packaging, transport, transaction costs, and administrative trade barriers. But due to the lack of information, RASMU thus far considers only railway transport costs. As a proxy for real transport costs, these are probably overestimated. However, existing estimations of trade costs for Ukrainian grain trade indicate that the magnitude of the current transport costs in RASMU comes relatively close to the level of overall trade costs.

The decision variable for crop supply is the regional cropping area, which is driven by the change in revenue per hectare. This formulation has been chosen to allow for the simulation of abrupt yield shocks for a crop, which often happens in Ukraine due to adverse weather conditions. Production of livestock and processed commodities is driven, in turn, by the change in the prices of crops, livestock, and processed products. Consumption demand is determined by a linear expenditure system (LES) in which the marginal budget share is fixed and each commodity is characterised by a minimum consumption (subsistence) level. Processing demand is represented by fixed (Leontieff-type) input-output coefficients.

The database of RASMU consists of annual regional-level data for 2001 and 2002: i) production and consumption, ii) regional prices (producers, consumers), iii) border prices, iv) trade costs (railway fees). The data was accumulated from different sources: National and regional statistics, international statistics (FAO), surveys of farms, rural households, and consumers, as well as own parameter estimations based on surveys (elasticities).

3.2 Minimum prices in RASMU

This subsection shows how the RASMU model, formulated as a Mixed Complementarity Problem (MCP), deals with a minimum price regime and compensating consumer subsidies. Following the discussion in Chapter 2, the state commits itself to buying grain surpluses from producers at a minimum price P_M . Thus we introduced the minimum price regime to the optimization problem as an additional constraint in the form of an inequality:

$$P_M \leq PD_{i,r} \perp VINTV_{i,r} \geq 0 \quad \forall i, r \quad (1)$$

where the symbol " \perp " means at least one of the adjacent inequalities must be satisfied as a strict equality. In other words, the inequality (1) says that if the domestic price for good i , $PD_{i,r}$, in the target region r exceeds the floor price level P_M , then the volume of intervention purchases of grain $VINTV_{i,r}$ must be positive.

We also accounted for the net budgetary outlays necessary to carry out intervention purchases at the minimum price (and eventually exporting it abroad at

world prices), so as the difference between these magnitudes would constitute the net costs of the program to the budget. Also, we added intervention stocks $VINTV_{i,r}$ as an additional component to the total demand calculations.

A consumer subsidy has been introduced as a negative *ad valorem* tax on bread products:

$$P^C_{i,r} = PD_{i,r} \cdot (1 + Pm_{i,r} - Subs_{i,r}) \quad \forall i = bread, r \quad (2)$$

where $P^C_{i,r}$ stands for consumer price for good i in the target region r ; $PD_{i,r}$ is the warehouse price; $Pm_{i,r}$ is a processing margin (including VAT); and $Subs_{i,r}$ is a consumer subsidy. Also, we accounted for additional budgetary outlays for subsidizing bread consumption.

3.3 The policy experiments

This section discusses policy simulation scenarios using RASMU to estimate the economic costs and benefits of introducing a minimum price regime for cereals. We distinguish between the following scenarios, which are compared to the base situation without minimum prices:

1. Scenario I: Floor price at UAH 800/t⁶ (USD 151.2/t) for wheat and a EURO 40/t import duty;⁷
2. Scenario II: Scenario I, plus a compensatory 20 % consumer subsidy for bread products;
3. Scenario III: Floor prices at UAH 800/t (USD 151.2/t) for wheat, UAH 600/t (USD 122.5/t) for rye, and UAH 450/t (USD 92.3/t) for barley; import duty is set at EURO 40/t for all three crops⁸.

Scenario I: We present the results for Simulation I in Table 1. The table also illustrates the impact of the minimum price regime on the 'bread products' sector. Generally, Table 1 quantitatively supports the analysis we conducted in Chapter 2. If a floor price for wheat were implemented, we would observe an expansion of both area and production by almost 16 % (18 m tons) due to increased prices. Producers most likely would use either idle land or substitute land under competing crops for wheat. In total, the surplus of wheat producers would increase by nearly 1,377 m USD as a consequence of introducing the floor price. Due to the in-

⁶ At this price, the GOU purchased wheat to intervene on stocks in 2004 (AGROBUSINESS, No. 14, 2004)

⁷ The import duty is necessary to prevent imports from entering the domestic market in unlimited amounts, thus thwarting the desired effects of the minimum price regime.

⁸ At this price, the GOU purchased wheat, rye, and barley to intervene on stocks in 2004 (AGROBUSINESS, No. 14, 2004). Moreover, in 2005, GOU is also determined to continue intervention purchases on the grain market.

creased domestic price (UAH 800/t = USD 151.2/t) wheat becomes a more expensive input for the processing sector (both feed and bread products), which leads to decreased processed volumes (-3.6 %) and feed use (-68.6 %). As a consequence, producers of breadstuffs would be worse off by USD 157.8 million. We observe a slight decline in the domestic consumption of breadstuffs, by -3.6 %, primarily due to increased domestic prices on bread products by 15 %, but also combined with the assumption that bread products are non-tradable. Further, increased domestic prices on breadstuffs requires rigorous consideration. Since bread products constitute a considerable share of expenditures of the representative household in Ukraine (GALUSHKO et al., 2004), rising prices for bread may bear considerable political risk. The GOU may counteract with additional measures, meaning additional budget expenditures, to be discussed below.

Table 1: Scenario I: National results for wheat and bread products

| | Base values: | Scenario I: | Changes in percent |
|--|--------------|-------------|--------------------|
| Wheat | | | |
| Area (1,000 ha) | 5,978 | 6,926 | 15.9 |
| Production (1,000 t) | 15,657 | 18,185 | 16.1 |
| Processing (1,000 t) | 6,122 | 5,903 | -3.6 |
| Feed use (1,000 t) | 4,789 | 1,503 | -68.6 |
| Net trade (non-subsidised exports) (1,000 t) | 3,049 | 0 | -100.0 |
| Intervention stocks/subsidised exports (1,000 t) | | 8,734 | |
| Domestic price (US\$/t) | 91 | 151 | 66.0 |
| Producer surplus (m US\$) | | 1,377 | |
| Bread Products | | | |
| Production (1,000 t) | 6,101 | 5,884 | -3.6 |
| Domestic consumption (1,000 t) | 6,101 | 5,884 | -3.6 |
| Producer margin (US\$/t) | 176 | 155 | -11.5 |
| Domestic price (US\$/t) | 275 | 317 | 15.1 |
| Producer surplus (m US\$) | | -157 | |

Source: RASMU simulations.

Most importantly, Table 2 shows that the government would need to take about 8.7 m tons of wheat away from the market in order not to let the market price slip below the floor price level; and this for an average year! This is caused by the expectation that unsubsidized exports of wheat (Table 1) will no longer be competitive on the international market at a floor price of UAH 800/t.⁹ Table 2 also illustrates the welfare implications of the minimum price regime for the model regions and Ukraine as a whole. It can be clearly seen that the *South* and *Central* regions would gain the most, whereas *Northern* and *Western* regions

⁹ An attempt of the GOU in 2004 to procure only 3.5 m tons of grain (where wheat constituted only a share of the volume) from the market to support producers was far sufficient for that purpose.

would lose. This is due to the fact that the *South* and *Central* regions produce the most significant wheat surpluses in Ukraine, so they are better off, first of all, due to significantly increased crop producer surpluses. But on the national level, Ukraine would suffer a USD 179 m welfare loss, which means that the losses of the *West* and *North* regions would outweigh the gains of the *Central* and *South* regions. Moreover, floor prices for wheat alone would cost at least USD 614 m, or approximately 5 % of the 2004 central state budget, which is equivalent to all central budget expenditures for agriculture in 2004.

Table 2: Scenario I: Intervention stocks and overall welfare changes

| | Scenario I vs. base values | | | | |
|--|----------------------------|-------|------|---------|-------|
| | Ukraine | North | West | Central | South |
| Regional wheat intervention stocks (1,000 t) | 8,734 | 373 | 0.0 | 3,303 | 5,057 |
| <i>Welfare effects (m USD)</i> | | | | | |
| Feed users | -441 | -94 | -73 | -159 | -115 |
| All producers and processors | 1,003 | 128 | 70 | 356 | 449 |
| Consumers | -568 | -117 | -92 | -161 | -199 |
| Taxpayers (budget) | -614 | -136 | -101 | -158 | -219 |
| Total welfare | -179 | -125 | -123 | 37 | 31 |

Source: RASMU simulations.

As these calculations do not include the administrative costs of the program, these 5 % rather represent a lower boundary of budgetary costs. Producers, however, would gain about USD 1.0 bn, with the *Central* and *South* regions benefiting the most, as this is where the bulk of the wheat supply is located. On the other hand, animal producers, processors, consumers and taxpayers would suffer huge losses regardless of their home region. Obviously, taxpayers in the *South* and *Central* regions would incur the highest losses. The reason for this is that the *Central* and *South* regions are significantly more populated than the *North* and *West*, meaning higher overall costs of increased consumer prices for the region. Feed users are confronted with a similar situation, as the demand for feed wheat is higher in the *South* and *Central* regions, meaning higher overall losses there.

Scenario II: For the second scenario, we chose a consumer subsidy (20 % *ad valorem*) such that the consumption level of bread products is kept constant, in contrast to Simulation I. Table 3 describes the welfare implications if the GOU were to introduce a minimum price regime coupled with this compensating consumer subsidy.

Table 3. Scenario II overall welfare changes

| | Scenario II vs base values (m USD) | | | | |
|------------------------------|------------------------------------|-------|------|---------|-------|
| | Ukraine | North | West | Central | South |
| Feed users | -458 | -98 | -79 | -163 | -117 |
| All producers and processors | 1,190 | 170 | 97 | 410 | 512 |
| Consumers | -353 | -71 | -69 | -100 | -111 |
| Taxpayers (budget) | -926 | -205 | -152 | -238 | -330 |
| Total welfare | -89 | -106 | -124 | 71 | 70 |

Source: RASMU simulations.

Compared to Table 2, however, we observe a 50 % increase in central budget expenditures, i.e., almost USD 1 billion. Producers also benefit to the magnitude of almost USD 190 m, while the welfare of bread consumers alone increases by about USD 213 m, which complies with our qualitative analysis in Section 2.1. Nevertheless, consumers as a whole still suffer losses, because the notion "consumer" in the model comprises the whole spectrum of consumers, not just bread consumers. While bread product consumers are compensated, consumers of milk or meat products are not, despite increased milk and meat prices due to feed wheat price changes. Additionally, we observe a smaller national welfare loss as compared to Simulation I. This can be explained by the partial character of the model: The misallocation on the consumer side is partly removed, while the negative effect of the additional tax burden on resource allocation is not accounted for in a partial equilibrium model.

Scenario III: In August 2004 the Ukrainian Law "On the state support of Ukrainian agriculture" listed products that are subject to state regulation via an intervention price system. These included wheat, rye, barley, oat, corn, wheat and rye flour, sugar, soybean, flax, rape, sunflower seed and hops. Nevertheless, a decision on the levels of floor prices has not yet been made for 2005. So we decided to design Scenario III such that the official 2004 pledge prices serve as reference for the simulation of minimum prices for wheat, rye, and barley. In fact, those prices were set significantly higher than world prices. Table 4 shows the main results.

Table 4. Scenario III: National results for grains and other crops

| | Base values: | Scenario III: | Changes in percent |
|--|--------------|---------------|--------------------|
| Wheat, rye, barley | | | |
| Area (1,000 ha) | 10,536 | 11,159 | 5.9 |
| Feed use (1,000 t) | 10,794 | 6,902 | -36.1 |
| Net trade (non-subsidized exports) (1,000 t) | 4,957 | | -100.0 |
| Intervention stocks/subsidized exports (1,000 t) | | 13,820 | |
| Producer surplus (m US\$) | | 1,285 | |
| Other crops | | | |
| Area (1,000 ha) | 7,505 | 6,796 | -9.4 |
| Feed use (1,000 t) | 10,174 | 10,028 | -1.4 |
| Net trade (non-subsidized exports) (1,000 t) | 1,916 | 425 | -77.8 |
| Producer surplus (m US\$) | | 426 | |

Source: RASMU simulations.

Compared to Scenario I, the area increase of favoured crops by percent is smaller. Unsubsidised exports of the favoured crops cease to happen and are replaced by an astonishing amount of almost 14 m tons, which go into intervention stocks. These mainly 'consist' of former exports and the reduced feed use quantities. The cross-price effects lead to shrinking areas of competing crops, which reduces net trade and increases domestic prices. As a consequence, feed users cannot reasonably substitute wheat and barley in their rations, as can be seen from the feed use results for competing crops.

Table 5. Scenario III overall welfare changes

| | Scenario III vs. Base values (m USD) | | | | |
|------------------------------|--------------------------------------|-------|------|---------|-------|
| | Ukraine | North | West | Central | South |
| Feed users | -735 | -186 | -130 | -242 | -175 |
| All producers and processors | 1523 | 285 | 155 | 509 | 573 |
| Consumers | -1042 | -231 | -184 | -280 | -346 |
| Taxpayers (budget) | -628 | -139 | -103 | -161 | -224 |
| Total welfare | -147 | -85 | -132 | 67 | 2 |

Source: RASMU simulations.

From Table 5 it becomes clear that feed users (e.g. livestock producers) and consumers would suffer most from an expansion of the minimum price regime. The main reason for this is the increased price for grain crops, which translates to higher input prices to feed users and processors, and eventually to consumers. If we compare Table 5 and Table 2, we see that feed users and consumers would lose twofold more. On the other hand, producers will benefit by almost USD 1.5 billion, which is 50 % more than in Scenario I. On the national level, Ukraine would suffer a USD 147 m welfare loss, coupled with significant budget

outlays of USD 628 m. Concerning the regional distribution of welfare effects, the situation is similar to Scenario I and II. Namely, while producers in the *South* and *Central* regions benefit most, consumers, taxpayers, and feed users lose.

The simulation results illustrate that once the government supports producers, it starts a whole cycle of consequences: Huge budget outlays, implicit taxation of feed and downstream sectors, and higher consumer prices. If the government tries to counteract by compensating consumers through subsidies, it additionally increases budgetary outlays, which leaves consumers only partially compensated.

4 CONCLUSIONS

The analysis illustrates sectoral adaptation processes and welfare implications for Ukraine's economy if a minimum price regime were seriously implemented there. First of all, the GOU would incur huge budget outlays accrued by sustaining such an intervention system. As the analysis has shown, the GOU would need at least USD 614 m to maintain prices at a floor level. This constitutes approximately 5 % of the 2004 central state budget, or all central budget expenditures on agriculture in 2004, which is quite a lot for Ukraine under the current budget constraints. From an economic point of view, if a minimum price regime happened to be implemented, Ukraine would suffer a USD 179 m welfare loss. But behind this net effect are much larger redistributive processes at work which would shift wealth from feed users, processors, consumers and taxpayers on to grain producers. The more the government tries to compensate losers, the higher are the budgetary costs of the measures. A partial model underestimates the distortions which are inflicted on the national economy by increasing taxes to help a relatively small group of producers.

Alluding to the motto of the IAMO forum 2005, too much mistrust of the ability of the 'invisible hand' to stabilise producer incomes can quickly turn into a very costly affair. Even if the intervention system would be based on minimum prices in line with long-term average domestic prices, neither price nor income stabilisation is a simple and cost-neutral matter of buying wheat in times of excess supply, storing it, and selling it later when prices are dear. Ukrainian grain (wheat) prices do not follow a regular seasonal pattern because neither do world prices. This is explained by the fact that at any point in time, grain is being harvested somewhere in the world (CRAMON, 2003). Each of these harvests is subject to fluctuations due to factors such as weather and policy changes. As a consequence, traders on the world grain market face a continuous flow of new information, which has an impact on world price levels, and which are transferred to domestic markets. Since each year is characterized by a unique flow of information, each year is also characterised by a unique seasonal price pattern.

The amount of grain likely to be subject to intervention purchases is very high and exceeds the current average grain net exports, as feed use would be reduced. Sooner or later this grain would have to be disposed of on the world market using export subsidies, given the assumption that long-term grain prices on the international market remain largely stable. But this would thwart the attempts of Ukraine to become a member of the WTO. Another important aspect is the burden laid on livestock producers through the introduction of such high floor prices. Livestock production has suffered most during transition, and it would be disastrous to disrupt the recovery of this promising sector through implicit taxation.

There are more effective options Ukrainian policy makers can choose from. The notorious failure to refund VAT on grain exports indirectly taxes Ukrainian producers of grain. Exporters simply offer a lower bid price to grain producers to compensate for VAT refund arrears. Straightening out the VAT refund administration to grain exporters would most likely lead to a bid up of producer prices. Moreover, investing budget funds into improving marketing services and infrastructure would be another feasible option for GOU. Investments in transport infrastructure are the most important component of price stabilisation policies, since improved transportation networks decrease marketing costs, increase farm-gate prices (thus increasing farmers' incomes), lower input costs and thus significantly contribute to the reduction of price fluctuations.

REFERENCES

- AUERBACH, R. (1970): The effects of price supports on output and factor prices in agriculture, *The Journal of Political Economy*, Vol. 78, pp. 1355-1361.
- GALUSHKO, V., KUHN, A., NIVYEV'S'KIY, O. (2004): The 2003 wheat crisis and food security, in: VON CRAMON-TAUBADEL, S., DEMYANENKO, S., KUHN, A. (eds.): *Ukrainian Agriculture – Crisis and Recovery*, Kyiv, pp. 167-180.
- GARDNER, B. L. (1987): *The economics of agricultural policies*, Macmillan Publishing Company, NY.
- KUHN, A. (2004): RASMU: Regional agricultural sector model for Ukraine, *IER Working Paper No. 27*, IER, Kyiv, <http://pigra.kiev.ua/ier/wp/wp_27_eng.pdf>.
- LICHTENBERG, E., ZILBERMAN, D. (1986): The welfare economics of price supports in U.S. Agriculture, *The American Economic Review*, Vol. 76, pp. 1135-1141.
- MIRANDA, M. J., HELMBERGER, P. G. (1988): The effects of commodity price stabilization programs, *The American Economic Review*, Vol. 78, pp. 46-58.
- PUSTOVIT, N. (2003): EU-Osterweiterung und WTO-Liberalisierung aus Sicht der ukrainischen Agrarwirtschaft. Wirkungsanalyse und Bewertung mit Hilfe eines partiellen Gleichgewichtsmodells, Dissertation, University of Giessen (Germany), Vauk.

-
- OECD (2004): Achieving Ukraine's agricultural potential. Stimulating agricultural growth and improving rural life, Paris.
- VON CRAMON-TAUBADEL, S. (2003): Wheat market stabilization: Option for Ukraine, *IER Advisory Paper No. T18*, IER, Kyiv, <http://www.ier.kiev.ua/English/papers/t18_en.pdf>.
- VON CRAMON-TAUBADEL, S., ZORYA, S. (2004): The implication of WTO-Accession for agriculture Policy in Ukraine, in: VON CRAMON-TAUBADEL, S., DEMYANENKO, S., KUHN, A. (eds.): *Ukrainian Agriculture – Crisis and Recovery*, Kyiv, pp. 5-15.
- WRIGHT, B. R., WILLIAMS, J. C. (1984): The welfare effects of introduction of storage, *The Quarterly Journal of Economics*, Vol. 99, pp. 169-192.

- Vol. 1 **The Importance of Institutions for the Transition in Central and Eastern Europe with Emphasis on Agricultural and Food Industry**
ed. by Klaus Frohberg and Witold-Roger Pogonietz
1998, 137 pages, ISBN 3-8175-0258-3
- Vol. 2 **The Significance of Politics and Institutions for the Design and Formation of Agricultural Policies**
ed. by Klaus Frohberg and Peter Weingarten
1999, 254 pages, ISBN 3-8175-0289-3
- Vol. 3 **Food Processing and Distribution in Transition Countries. Problems and Perspectives**
ed. by Monika Hartmann and Jürgen Wandel
1999, 349 pages, ISBN 3-8175-0293-1
- Vol. 4 **Die private Nachfrage nach Nahrungsmitteln im Transformationsprozeß Tschechiens und Polens**
Stephan Brosig (PhD)
2000, 171 Seiten, ISBN 3-8175-0319-9
- Vol. 5 **Integrating Estonia into the EU: Quantitative Analysis of the Agricultural and Food Sector**
Achim Fock (PhD)
2000, 286 pages, ISBN 3-8175-0320-2
- Vol. 6 **Competitiveness of Agricultural Enterprises and Farm Activities in Transition Countries**
ed. by Peter Tillack and Frauke Pirscher
2000, 216 pages, ISBN 3-8175-0322-9
- Vol. 7 **Конкурентоспособность сельскохозяйственных предприятий и фермерской деятельности в странах переходного периода**
под редакцией Петера Тиллака и Фрауке Пиршер
2000, 253 страницы, ISBN 3-8175-0324-5
- Vol. 8 **Perspectives on Agriculture in Transition: Analytical Issues, Modelling Approaches, and Case Study Results**
ed. by Witold-Roger Pogonietz, Alberto Zezza, Klaus Frohberg and Kostas G. Stamoulis
2000, 433 pages, ISBN 3-8175-0323-7

- Vol. 9 **Land Ownership, Land Markets and their Influence on the Efficiency of Agricultural Production in Central and Eastern Europe**
ed. by Peter Tillack and Eberhard Schulze
2000, 485 pages, ISBN 3-8175-0325-3
- Vol. 10 **Landwirtschaft und Industrie in Russland – der Transformationsprozeß in der Ernährungsindustrie**
Jürgen Wandel (PhD)
2000, 361 Seiten, ISBN 3-8175-0334-2
- Vol. 11 **Food Consumption in Russia. An Econometric Analysis Based on Household Data**
Karin Elsner (PhD)
2001, 256 pages, ISBN 3-8175-0335-0
- Vol. 12 **Alexander Wasiljewitsch Tschajanow – die Tragödie eines großen Agrarökonomen**
hrsg. u. übers. von Eberhard Schulze
2001, 192 Seiten, ISBN 3-8175-0342-3
- Vol. 13 **Analysis of Food Consumption in Central and Eastern Europe: Relevance and Empirical Methods**
ed. by Stephan Brosig and Monika Hartmann
2001, 253 pages, ISBN 3-8175-0349-0
- Vol. 14 **Wettbewerbsprozesse und Firmenwachstum in der Transformation am Beispiel der polnischen Fleischindustrie**
Agata Pieniadz (PhD)
2002, 291 Seiten, ISBN 3-8175-0360-1
- Vol. 15 **Agricultural Enterprises in Transition: Parallels and Divergences in Eastern Germany, Poland and Hungary**
ed. by Ludger Hinners-Tobrägel and Jürgen Heinrich
2002, 455 pages, ISBN 3-8175-0366-0
- Vol. 16 **Agricultural Technology and Economic Development of Central and Eastern Europe. Results of the Workshop in Halle, 2nd – 3rd July 2001**
ed. by Peter Tillack and Ulrich Fiege
2002, 160 pages, ISBN 3-86037-199-1
- Vol. 17 **Региональные аспекты аграрных преобразований: политика, реструктуризация, рыночная адаптация**
под редакцией Петера Тиллака и Виталия Зиновчука
2003, 236 страницы, ISBN 3-928466-55-0

- Vol. 18 **Alexander Vasilievich Chayanov – the Tragedy of an Outstanding Agricultural Economist**
ed. by Eberhard Schulze
2003, 188 pages, ISBN 3-86037-201-7
- Vol. 19 **Development of Agricultural Market and Trade Policies in the CEE Candidate Countries**
by the Network of Independent Agricultural Experts in the CEE Candidate Countries
2003, 72 pages, ISBN 3-86037-212-2
- Vol. 20 **Large Farm Management**
ed. by Alfons Balmann and Alexej Lissitsa
2003, 396 pages, ISBN 3-86037-213-0
- Vol. 21 **Success and Failures of Transition – the Russian Agriculture between Fall and Resurrection**
ed. by Eberhard Schulze, Elke Knappe, Eugenia Serova, Peter Wehrheim
2003, 521 pages, ISBN 3-9809270-1-6
- Vol. 22 **Subsistence Agriculture in Central and Eastern Europe: How to Break the Vicious Circle?**
ed. by Steffen Abele and Klaus Froberg
2003, 233 pages, ISBN 3-9809270-2-4
- Vol. 23 **Pfadabhängigkeiten und Effizienz der Betriebsstrukturen in der ukrainischen Landwirtschaft – Eine theoretische und empirische Analyse**
Andriy Nedoborovskyy (PhD)
2004, 197 Seiten, ISBN 3-86037-216-5
- Vol. 24 **Nichtmonetäre Transaktionen in der ukrainischen Landwirtschaft: Determinanten, Spezifika und Folgen**
Olena Dolud (PhD)
2004, 190 Seiten, ISBN 3-9809270-3-2
- Vol. 25 **The Role of Agriculture in Central and Eastern European Rural Development: Engine of Change or Social Buffer?**
ed. by Martin Petrick and Peter Weingarten
2004, 426 pages, ISBN 3-9809270-4-0
- Vol. 26 **Credit rationing of Polish farm households – A theoretical and empirical analysis**
Martin Petrick (PhD)
2004, 254 pages, ISBN 3-9809270-6-7

- Vol. 27 **Drei Jahrhunderte Agrarwissenschaft in Russland: Von 1700 bis zur Gegenwart**
Alexander Alexandrowitsch Nikonow und Eberhard Schulze
2004, 232 Seiten, ISBN 3-9809270-8-3
- Vol. 28 **Russlands Weg vom Plan zum Markt: Sektorale Trends und regionale Spezifika**
Peter Voigt (PhD)
2004, 270 Seiten, ISBN 3-9809270-9-1
- Vol. 29 **Auswirkungen des Transformationsprozesses auf die sozio-ökonomischen Funktionen ukrainischer Landwirtschaftsunternehmen**
Helga Biesold (PhD)
2004 182 Seiten, ISBN 3-938584-00-9
- Vol. 30 **Agricultural policies and farm structures – agent-based modelling and application to EU-policy reform**
Kathrin Happe (PhD)
2004, 291 pages, ISBN 3-938584-01-7
- Vol. 31 **How Effective is the Invisible Hand? Agricultural and Food Markets in Central and Eastern Europe**
ed. by Stephan Brosig and Heinrich Hockmann
2005, 361 pages, ISBN 3-938584-03-3

In der Schriftenreihe *Studies on the Agricultural and Food Sector in Central and Eastern Europe* werden durch das IAMO Monographien und Tagungsberichte herausgegeben, die sich mit agrarökonomischen Fragestellungen zu Mittel- und Osteuropa beschäftigen. Wissenschaftlern, die in diesem Bereich forschen, steht die Schriftenreihe als Diskussionsforum offen.

In its series *Studies on the Agricultural and Food Sector in Central and Eastern Europe* IAMO publishes monographs and proceedings focusing on agricultural economic issues specific to Central and Eastern Europe. This series offers a forum to researchers studying this area.

ISSN 1436-221X
ISBN 3-938584-03-3