DISCUSSION PAPER

Leibniz Institute of Agricultural Development in Central and Eastern Europe

CONTRIBUTIONS TO THE 4TH YOUNG SCIENTISTS WORKSHOP ON AGRICULTURAL DEVELOPMENT IN CENTRAL AND EASTERN EUROPE
YSW-2006

RAUSHAN BOKUSHEVA, GERTRUD BUCHENRIEDER (EDS.)

DISCUSSION PAPER NO. 98
2006

Theodor-Lieser-Straße 2, 06120 Halle (Saale), Deutschland
Telefon: +49-345-2928 0
Fax: +49-345-2928 199
E-mail: iamo@iamo.de
Internet: http://www.iamo.de

Dr. Raushan Bokusheva is a senior research associate at the Department Structural Development of Farms and Rural Areas, Prof. Dr. Gertrud Buchenrieder is the Head of the Department External Environment for Agriculture and Policy Analysis. Both are at the Leibniz Institute of Agricultural Development in Central and Eastern Europe.

Mailing address: Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO)
Theodor-Lieser-Straße 2
06120 Halle/Saale
Germany

Phone: +49-345-2928 110
Fax: +49-345-2928 199
E-mail: iamo@iamo.de
Internet: http://www.iamo.de

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The series *Discussion Papers* is edited by:

Prof. Dr. Alfons Balmann (IAMO)
Prof. Dr. Gertrud Buchenrieder (IAMO)
Prof. Dr. Thomas Glauben (IAMO)

ISSN 1438-2172

PREFACE

Raushan Bokusheva, Gertrud Buchenrieder

This Discussion Paper contains the greater part of the contributions to the Young Scientists Workshop on Agricultural Development in Central and Eastern Europe (IAMO, September 4-5, 2006). After last years' positive response, the workshop has been organized for the fourth time and has a solid number of contributions. The aim of this annual event is to give young scientists the opportunity to present and discuss their transition-related research.

The following short versions of the workshop contributions serve as a basis for discussion during the workshop, but also offer a cross-sectional overview of current research being carried out by young scientists. Although the issues covered by the workshop contributions are quite diverse, they share a common interest in evaluating the impact of institutional and policy changes on agricultural and rural development at the current stage of transition. Regionally, the contributions focus on the new member states of the European Union, as well as countries of South Eastern Europe.

VORWORT DER HERAUSGEBER

Raushan Bokusheva, Gertrud Buchenrieder

Dieses Diskussionspapier enthält den größten Teil der Beiträge, die im Rahmen des Workshops zur Agrarentwicklung in Mittel- und Osteuropa für Doktoranden und kürzlich auch Promovierte vorgestellt und diskutiert werden. Dieser Workshop findet zum vierten Mal am IAMO statt, dieses Jahr vom 4. bis 5. September. Ziel der Veranstaltung ist es, Nachwuchswissenschaftlern die Möglichkeit zu geben, ihre Forschungsvorhaben zu präsentieren und zu diskutieren.

Die folgenden Kurzfassungen sollen allerdings nicht nur als Diskussionsgrundlage für den Workshop dienen, sondern auch einen kleinen Überblick über die gegenwärtige Nachwuchsforschung im Agrarbereich zu Mittel- und Osteuropa vermitteln. Auch wenn die Workshopbeiträge ein sehr breites Themenspektrum abdecken, beschäftigen sie sich alle mit der Analyse der Wirkung von politischen und institutionellen Änderungen auf die Entwicklung ländlicher Räume und des Agrarsektors im gegenwärtigen Stadium des Transformationsprozesses. Regional konzentrieren sich die Beiträge auf die neuen Mitgliedsländer der Europäischen Union und die Länder Südosteuropas.

CONTENTS

MODELING THE SHORT AND LONG RUN IMPACTS OF MACROECONOMIC VARIABLES ON ROMANIAN AGRICULTURE

Cornelia Alboiu

1 STUDY MOTIVATION AND OBJECTIVE

Changes in macroeconomic policy should play an increasing role for the Romanian agri-food sector since agriculture needs to become more capital intensive. Thus, Romanian agriculture has to increase its efficiency by benefiting from an improved macroeconomic environment. Generally, macroeconomic policy evolution can influence the agri-food sector, and a few studies show this. A review of previous agricultural economics literature reveals the significance of the monetary impact and macroeconomic variables upon agricultural prices and on the possible performance of the agricultural sector (SCHUH, 1974; CHAMBERS and JUST 1979; BATTEN and BELOGIA, 1986; SAGHAIAN, REED and MARCHANT, 2002; DORFMAN and LASTRAPES, 1996; KAABIA and GIL, 2001; MARCHANT, 2002; IVANOVA, 2003).

The objective of this paper is to understand and analyze the interdependency between Romanian macroeconomy and agricultural variables, paying particular attention to the structural long run relationships and short run dynamics. Moreover, money neutrality and price transmission mechanisms will be closely studied as farm incomes and their financial viability are very much influenced by market prices. The relationship between macroeconomics and agriculture should also be investigated to help identify the best macroeconomic policies that can be envisaged in order to facilitate the development of an efficient agri-food sector in Romania. Keeping in mind the above-mentioned objectives, the following research questions will be addressed:

- To what extent do macroeconomic variables influence and have a significant statistical effect upon agricultural input and output prices?
- To what extent do agricultural input prices influence output prices (cost push transmission mechanism) rather than the reverse situation: Output prices influence input prices (demand pull transmission mechanism)?
- Do agricultural or input prices overshoot in the short run?
- What is the dynamic response of the agricultural variables to the macro-economic shocks through the impulse response functions?

2 DATA AND METHODOLOGY

Seven variables were considered in this study: Five which characterized the macroeconomic sector, namely: Real money supply (M2), real GDP (GDP), consumer price index (CPI), interest rate (IR), exchange rate (Exrate) and two variables characterizing the agricultural sector – producer prices index (Opr) and input prices index (IP). Because economic liberalization was mainly completed in 1997, monthly data from January 1997 to December 2004 were used. Thus, the data set includes 96 observations; the length of the sample was determined by the fact that in 1997, the liberalization process was mainly accomplished. The monthly GDP and money supply variables were calculated by interpolating annual observations using the statistical software SAS. All variables are expressed in logarithms. Time series properties of the data were studied using the ADF test.

The methodology used in this study is as follows: First we draw on the concept of cointegration as developed by JOHANSEN and JUSELIUS (1994) and test several hypothesis (i.e., money demand, output demand, input prices and agricultural prices) based on economic theory, and second, we evaluate short run dynamics while specifying a vector error-correction (VEC) as a system of structural cointegrating vectors.

Considering a set of a K time series variables $y_t=(y_{1t,\ldots..}y_{kt})'$, the basic model of order p (VAR(p)) can take the following form:

$$\mathbf{Y}_t= \alpha_0 + \alpha_1 t + \mathbf{A}_1 y_{t-1} + \ldots\ldots\ldots + \mathbf{A}_p y_{t-p} + u_{t,} \quad (1)$$

where the A_i's are (k x k) coefficient matrices and $u_t= (u_{1t,\ \ldots..}u_{kt})'$ is the error term, with $E(u_t u'_t)=\Sigma_u$, or $u_{t'}$ s are independent stochastic vectors with $u_t \sim (0, \Sigma_u)$. As our interest focuses on cointegration relations, the vector error correction model is a more convenient model setup for cointegration analysis. Thus, the VAR model can be reformulated into a VECM that can take the following form:

$$\Delta\mathbf{Y}_t = \alpha_0 + \alpha_1 t + \mathbf{\Pi} y_{t-1} + \mathbf{\Gamma_1}\Delta y_{t-1} + \ldots\ldots + \mathbf{\Gamma}_{p-1}\Delta y_{t-p+1} + u_{t,} \quad (2)$$

where $\mathbf{\Pi}=-(I_k - A_1 - \ldots.. - A_p)$ and $\mathbf{\Gamma_i}=-(A_{i+1} + \ldots. + A_p)$ for i=1,…..p-1; $\mathbf{I}_k$ is the identity matrix.

A more generalized form of (2) could be written as: $\Delta y_t = \delta D_t + \mathbf{\Pi} y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + u_{t,}$

where Y_t is a vector of endogenous variables, $\mathbf{\Pi}$ is a (p x p) matrix of short-term parameters, $\mathbf{\Gamma_i}$ is a (p x p) matrix of long-term parameters, D_t is a vector of deterministic terms (a constant, a linear trend, seasonal dummies, etc.), and u_t is the error term as already defined above.

Impulse response functions from a VEC and a structural vector error correction model (SVEC) will be also calculated.

3 RESULTS

The VAR econometric models showed a movement from restrictions imposed with statistical techniques towards approaches which highlight the importance of considering economic theory, especially when long run relationships exist.

In this paper we have estimated the long run money demand equation, the output demand equation and the price overshooting hypothesis within a system containing both macroeconomic and agricultural variables. The equations used were derived based on economic theory and contained not only identifying restrictions, but also restrictions which were tested as single equations and then tested within the whole system. The employed statistical test could not reject the assumptions made and the estimated parameters had reasonable values and were statistically significant.

For policy analysis, one could first notice that a money neutrality hypothesis holds in the case of industrial prices, but not for agricultural output prices. Input prices respond faster than agricultural prices and money neutrality for input prices holds in the long run; but no evidence was found that agricultural prices rise proportionally more than the money supply, which squeezes agricultural prices. This suggests further negative implications for farmers' revenues in the long run. Second, the short run dynamic analysis showed that industrial prices influence agricultural prices and as a consequence, the cost push mechanism is running the market.

This research might represent the first attempt to study the relationship between macroeconomic variables and Romanian agriculture. Imposing structural restrictions resolves the non-uniqueness problem of the innovations. Even if the restrictions were imposed based on economic theory, the

results should be examined taking into consideration both the chosen variables and the sample period. The results suggest that macroeconomy has real effects on agricultural prices and this is why an expansive monetary policy might benefit agriculture. Although the data might not have been extensive enough to exactly reveal the basic processes, it is important to consider larger models which contain contemporaneous and long run restrictions. These models could provide further insights into the relationship between monetary policy and agriculture or on the feedback between macroeconomy and agriculture.

REFERENCES

BATTEN, D. S., BELONGIA, M. T. (1986): Monetary policy, real exchange rates and U.S. agricultural export, *American Journal of Agricultural Economics, 68,* pp. 422-427.

CHAMBERS, R. G., JUST, R. E. (1980): A critique of exchange rate treatment in agricultural trade model, *American Journal of Agricultural Economics, 62,* pp. 255-259.

DORFMANN, J. H., LASTREPES, W. D. (1996): The dynamic responses of crop and livestock prices to money supply shock: A bayesian analysis using long-run identifying restrictions, *American Journal of Agricultural Economics, 78*, pp. 530-541.

IVANOVA, N., DAWSON, P., LINGARD, J. (2003): Macroeconomic impacts on Bulgarian agriculture during transition, *Applied Economics,* pp. 817-823.

JOHANSEN, S., JUSELIUS, K. (1994): Identification of the long-run and the short-run structure: An application to the ISLM model, *Journal of Econometrics, 53*, pp. 211-244.

KAABIA, M. B., GIL, J. M. (2000): Short- and long-run effects of macroeconomic variables on the Spanish agricultural sector, *European Review of Agricultural Economics, 27,* pp. 449-471.

SAGHAIAN, S. H., REED, M. R., MARCHANT, M. A. (2002): Monetary impacts and overshooting of agricultural prices in an open economy, *American Journal of Agricultural Economics, 84,* pp. 90-103.

SCHUH, G. E. (1974): The exchange rate and the U.S. agriculture, *American Journal of Agricultural Economics, 56,* pp. 1-13

LAND CONSOLIDATION – AN INDISPENSABLE PART OF SUSTAINABLE AGRICULTURAL DEVELOPMENT IN MOLDOVA

Dragoş Cimpoieş

1 STUDY MOTIVATION AND OBJECTIVE

Creating independent family farms (so-called peasant farms) was one of the primary goals of the phase of land reform that took place between 1998 and 2000. More than 250,000 peasant farms were created, averaging 1.8 hectares in size (compared with hundreds and even thousands of hectares for corporate farms). The small size of the peasant farms, whose holdings are, moreover split into 3-4 parcels, raises considerable concerns about their long-term viability and has led to an intense public debate regarding the impacts of fragmentation. Land fragmentation in Moldova thus has two characteristics: The exceedingly small size of family farms and the fragmentation of land ownership into multiple parcels.

Land fragmentation is viewed by Moldovan policymakers as being one of the major problems of agriculture in the post-privatization period. Eliminating farm fragmentation is regarded by government officials as a necessary condition for increasing agricultural productivity, improving the efficiency of machinery utilization, achieving income growth and poverty alleviation in rural areas. These concerns have focused attention on mechanisms and instruments for land consolidation.

The objective of this paper is to study land consolidation through market mechanisms. Market transactions ultimately lead to concentration of land into the hands of producers with the best managerial skills and are capable of achieving high levels of productivity and efficiency. The most obvious form of land transactions – buying and selling land – is typically supplemented by land leasing, which plays a particularly important role in transition countries (such as Moldova), where economic uncertainty, nontransparent legislation, and undeveloped credit systems are barriers to ownership transfer transactions.

2 METHODOLOGY

Data from several surveys in Moldova are used in this paper to support the case for land consolidation. In general, the aforementioned surveys cover the whole territory of the country. In this study, survey data are supplemented with transaction information from state cadastre sources and the Department of Statistics.

In order to reveal the relationship between farm size and farm performance, total factor productivity (TFP) is used to calculate productivity, while farm efficiency is determined by using stochastic frontier analysis.

The impact of consolidation on rural families' standard of living is determined by using the multinominal logistic regression. In the conducted World Bank survey, farmers have been asked about their perceived standard of living or their family well-being. The question is, "What does your family income allow you to buy?" The answers fell into several categories: "Not enough for food," "only food and daily necessities," "food, daily necessities, clothes, footwear, etc.", and so on up to "no material difficulties". These answers were grouped into three categories: 1 for lowest standard of living (poverty), 2 for the medium standard of living (subsistence), and 3 for the highest standard of living (comfortable).

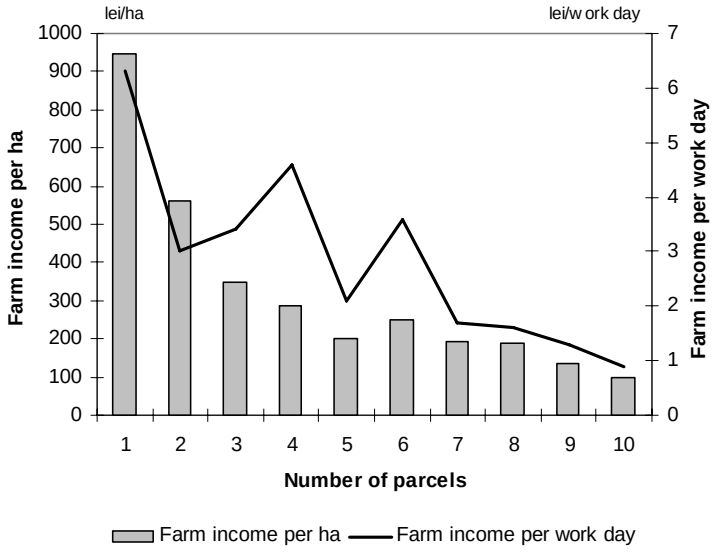
This well-being variable is used as a discrete dependent variable (with values 1, 2, 3) in a logistic regression. The model includes only one explanatory variable – land used by the farmer. Regression produces a certain coefficient that relates land use to the discrete levels of well-being. Standard analytical manipulations allow us to transform this coefficient into a probability curve for each of the three levels of well-being.

3 STUDY RESULTS

Common wisdom argues that consolidating small disjointed parcels into contiguous holdings is preferred by farmers and landowners. This kind of consolidation should reduce production costs and improve net income for a farm of a given size. Land consolidation that produces larger farms (keeping the number of parcels fixed) is also believed to be beneficial, as it should reduce the ratio of fixed costs per unit of land, allow more efficient technology usage, and ultimately increase productivity and efficiency. These theoretical arguments, however, are difficult to empirically substantiate and world experience does not unanimously support either position.

Some evidence that supports the advisability of reducing the number of parcels through land consolidation is provided by a 2003 World Bank survey of household plot operators in Moldova. This survey shows a clear negative relationship between productivity and the number of parcels held by the operator. The partial productivities of land and labor are calculated from the survey data as the value of farm income (including cash revenue from sales of farm products and value of own consumption) per hectare of land and per workday (including family workers and outsiders). The results presented in **Figure 1** clearly show that both the productivity of land (farm income per hectare) and the productivity of labor (farm income per workday) decrease as fragmentation (i.e., the number of parcels) increases. The negative relationship between productivity and fragmentation in **Figure 1** is statistically significant by all standard measures.

Figure 1: Partial productivity measures versus number of parcels for household plots in Moldova



Source: WB survey of household plots, 2003.

These results are reinforced by running a regression of farm income on three variables: Land used, work days, and number of parcels. Controlling for land and labor, the number of parcels has a negative effect on farm income and the coefficient is significant at $p < 0.1$ (**Table 1**). Both analyses thus show that consolidation – in the sense of reducing the number of parcels – makes economic sense, at least for household plots in Moldova in 2003. This conclusion is supported by the analysis of individual farms in Georgia from the 2003 HUJ survey. The Georgian survey also shows that productivity decreases with the increase of the number of parcels, when controlling for other relevant factors (LERMAN, 2005).

Table 1: Regression analysis of farm income versus fragmentation

Independent variables	Estimated coefficient	Significance level
Land used, ha	98,772	0.000
Labor, work days	0.444	0.000
Number of parcels	-17.077	0.063
Intercept	90,210	0.032
R-square	0.13	

Source: WB survey of household plots, 2003.

Note: Dependent variable: Farm income (including cash revenue from sales of farm products and value of own consumption).

To justify consolidation in the second sense, i.e., enlargement of small farms, we need to show that larger farms achieve higher productivity and efficiency. Unfortunately, economies of scale in agriculture are very elusive. Yet, it has been generally established that in CIS countries very large (corporate) farms are less efficient (by a variety of measures) than the much smaller individual farms. Evidence of this negative size effect in Moldova from several different surveys is shown in the next table.

Table 2: Total factor productivity (TFP) and Technical Efficiency of small and large farms in Moldova

	Small (individual) farms	Large (corporate) farms	Large-to-small ratio
TFP (lei per aggregated unit of inputs)			
2003 WB survey	6,426	4,745	0.74
2003 PFAP surveys	7,424	3,464	0.47
2000 WB survey	8,420	4,010	0.48
Technical Efficiency (Stochastic Frontier algorithm)			
2003 WB survey	0.64	0.46	0.72

Note: All differences between small and large farms statistically significant at $p = 0.10$.

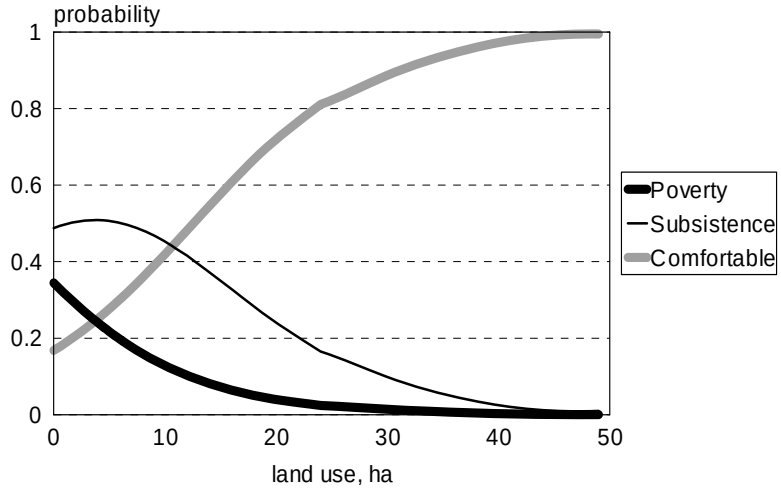
It is therefore impossible to recommend the consolidation of hundreds and thousands of small farms into large agricultural production cooperatives or other "farm enterprises" – a consolidation strategy often advocated by the Ministry of Agriculture in Moldova. This view is supported by evidence from the 2003 PFAP survey, where 77 % of corporate farm managers and 71 % of peasant farmers reject the option of consolidation through recreating agricultural production cooperatives (MURAVSCHI and BUCATCA, 2005).

Consolidation not only affects farm productivity, but also rural families' standard of living, where a comfortable standard of living is associated with a much larger farm size than lower

standards of living. Peasant farmers reporting a comfortable standard of living in the 2005 WB survey have, on average, 11 hectares compared with less than 5 hectares for farms in the two lower categories – poverty, when family income is not sufficient to buy food, and subsistence, when family income is just sufficient to buy food and daily necessities (the difference between farm sizes is statistically significant at $p < 0.01$). Peasant farmers' standard of living is thus an increasing function of farm size, as is commonly observed in farm surveys in CIS and other transition countries.

The relationship between standard of living and farm size is illustrated in **Figure 2**. Here the probability of being in the highest standard of living (gray curve) increases with farm size, while the probability of being on the lowest "poverty" level, when family income is not sufficient to buy food (thick black curve), sharply decreases with farm size. These results provide the ultimate support for land consolidation policies and hence the need to encourage land market development.

Figure 2: Probability of achieving a given standard of living as a function of farm size for peasant farmers



Source: WB survey, 2005.

Note: Definition of standard of living levels: "Poverty" – family income not sufficient to buy food; "subsistence" – family income just sufficient to buy food and daily necessities; "comfortable" – family income sufficient to buy food, daily necessities, and durables.

In conclusion, there are two dimensions of land fragmentation in Moldova: Small size of family farms and fragmentation of land ownership. The most common approach to land consolidation in Moldova is individual or market-driven consolidation, which relies on land market transactions – mainly leasing at the present stage. Both farmers and landowners acknowledge the desirability of consolidating small fragmented parcels into contiguous holdings. However, land consolidation should be carried out on a voluntary basis in accordance with market principles.

REFERENCES

LERMAN, Z. (2001): Moldova baseline farm survey October-November 2000. Part I: Survey of corporate farm managers and peasant farmers; Part II. Survey of rural families with household plots, Draft analytical report, Washington, DC, World Bank, 2001.

LERMAN, Z. (2005): Farm fragmentation and productivity: Evidence from Georgia, CENTER FOR AGRICULTURAL ECONOMIC (ed.): *Research Working Paper,* Rehovot, The Hebrew University of Jerusalem, <http://departments.agri.huji.ac.il/economics/lerman-main.html>.

LERMAN, Z., CSAKI, C., MOROZ, V. (1998): Land reform and farm restructuring in Moldova: Progress and prospects, *World Bank Discussion Paper 398,* Washington, DC, World Bank.

MURAVSCHI, A., BUCATCA, A. (2005): Agricultural policy in farmers' opinion, Chisinau, PFAP – Private Farmers Assistance Program, East-West Management Institute and USAID.

WORLD BANK (2005): Moldova agricultural policy notes: Agricultural land, Washington, DC, World Bank.

AGENT-BASED MODELLING OF SPATIAL COMPETITION

Marten Graubner

1 STUDY MOTIVATION AND OBJECTIVE

The existence of transport costs and the spatial distribution of supply and/or demand are sources of imperfect competition (GREENHUT, 1975). Therefore, many of the results derived from classical price theory no longer hold (CAPPOZZA and VAN ORDER, 1978). Despite the common use of atomistic structure as an example, most agricultural markets, and particularly the raw milk market, are appropriate examples for spatially influenced, imperfect markets. In 2003, approximately 73,000 milk producers (of over 20 cows) have access to perhaps 200 processing firms (ZMP, 2005). However, in the spatial setting, competition takes place between only a few neighbouring processors. Raw milk is a highly homogeneous, perishable good with corresponding transport and storage technology requirements, and additionally, the value per weight is low. Hence, raw milk is more sensitive in relation to transport costs compared with other (industrial) products. Furthermore, due to the connection between milk production and land use, both as fodder and/or as area for deploying manure, dairy farms are distributed over geographical space.

The theory of *Spatial Economics* provides explanations regarding the relation between the location, behaviour and pricing of firms by the transition from point to spatial markets. One typical distinction for existing models is the underlying pricing rule. A common assumption for the raw milk market is the use of the uniformly-delivered price (udp or sometimes also cif) system (ALVAREZ et al., 2000). According to PHLIPS (1983) this displays price discrimination due to the lack of price variety over space dictated by transport costs. That is, closer suppliers receive the same price as distant customers instead of a higher one.

In contrast to the rising interest in New Economic Geographic, there were only a few studies in the last years under the framework of spatial competition and price theory. One of the main causes can be seen in the problems of analysing complex economic systems in general, and spatial markets in particular. Models dealing with spatial competition do not transcend simple and restrictive assumptions. Even with this high degree of simplicity, in certain cases analytically difficult issues arise (e.g. the non-existence of equilibrium in pure strategies). Those, of course, influence the explanatory power and application on real life (spatially) economic processes. But otherwise, the exponential increase of computational capacity and the development of a new stream of doing science (AXELROD, 1997) may be able to overcome some of the critical restrictions. This is the starting point of my work.

The aim of my dissertation is to use certain approaches from the field of Computational Economics, such as *Agent-Based Modelling* (ABM) and *Genetic Algorithms* (GA) to analyse a spatial market. The object of investigation is the German raw milk market. I will combine the aforementioned tools with previously-known models of general deductive analysis to gain insights in the complex system of spatial competition and price-setting. The intention is to centre the identification of cooperative or non-cooperative strategies used by the milk processing firms in the competition process. Moreover, testable hypotheses shall be derived to evaluate the impact of space dependent variables on pricing and competition. The connection of theory and the possibility of empirical analysis is also an important concern.

2 METHODOLOGY

In the present work I will use an Agent-Based Model to analyse spatial competition. Here, ABM is a computing-based simulation of economic actors (agents) and their interactions employed to gain macro-level observations derived from defined micro-level behaviour. This method enables recognition of a plurality of features. According to HAPPE (2004) there are at least five ways to extend existing research on the development of economies: (1) construction of artificial economies with heterogeneous, interacting agents using defined internal decision rules, (2) a wide range of behaviour rules is feasible and there is the possibility of endogenous adaptation, (3) Agents can co-evolve, (4) the system can grow along a real time-line and (5) the explicit consideration of space is possible.

The justification for using computational approaches to theory is "the excessive simplicity of currently tractable theoretical models" (JUDD, 1997). In the circumstance of spatially investigating the German raw milk market, we have to consider features widely excluded from existing models, which include the extension of the number of competitors (over two), the shape of the market area (at least two-dimensional), and the heterogeneous natures of the processing firms e.g. regarding capacity, product range or legal form. The aim is to model different kind of agents (milk processors) with such properties and let them interact on an artificial market, whereas this shall consist in structural characteristics of the real market.

One of the important issues is determining the individual behaviour of the agents. The question thereby is: How to process environmental information (like competitors' prizes or market areas) and own capabilities to a few condensed decision variables (like own price). In line with existing theoretical models, there are known consequences from using certain behaviour systems (derived under defined assumptions). The difficulties arising in this manner are in handling non-linearity and discontinuity (see for example MASKIN and DASGUPTA, 1986). For this reason, I will introduce another method from the field of Computational Economics – Genetic Algorithm. GA is a heuristic search tool used to discover optimal points in a highly complex solution space. GA can be used both for optimisation and for finding Nash-equilibria. GA applies operators derived from biological evolution: Selection, recombination (crossover) and mutation on a population of possible solution, called genomes (see for example MITCHELL, 1996). The advantage is not only in identifying the best of the predefined solutions, but also generating new (and possibly better) solutions.

To summarize, I will develop an Agent-Based Model under an udp-competition framework. The agent's decisions and subsequentially their actions are determined by GA. To achieve the goal of simulating the German raw milk market with a focus on spatial competition, the following procedure will be practised: At first I will develop and test already examined classical models in a computational attempt, mainly the work with Genetic Algorithm, as pure optimisation. In a second stage, more complex situations will be analysed under the use of ABM. After that, issues of evaluation and the explanatory power of the results, necessary calibrations and extensions of the model will be repetitively considered.

3 RESULTS AND STATE OF WORK

Because of the multidisciplinary nature of the project, the literature covers two main topics – theoretically spatial economics and, more methodologically, the computational approaches. The first part is almost finished, minus some specific issues. The current work is concerned with questions of programming and genetic algorithm in general. More precisely, there are preliminary results of the GA application on simple spatial optimisation problems. The object

of investigation was an udp-model of Löschian competition developed by ALVAREZ et al. (2000). I can show that the employed GA is able to find a solution close to the theoretical value. The manner of modelling is not very flexible so far and has to improve for more complicated problems.

REFERENCES

ALVAREZ, A. M., FIDALGO, E. G., SEXTON, R. J., ZHANG, M. (2000): Oligopsony power with uniform spatial pricing: Theory and application to milk processing in Spain, *European Review of Agricultural Economics*, *Vol. 27 (3),* pp. 347-364.

AXELROD, R. (1997): The complexity of cooperation, *Princeton Studies in Complexity*, Princeton University Press, Princeton (New Jersey).

CAPOZZA, D. R., VAN ORDER, R. (1978): A generalized model of spatial competition, *American Economic Review*, *Vol. 68 (5),* pp. 896-908.

GREENHUT, M. L. (1975): A theoretical mapping from perfect competition to imperfect competition, in: GREENHUT, M. L. (ed.): Spatial Microeconomics, Edward Elgar, Aldershot and Brookfiled, Vermont.

HAPPE, K. (2004): Agricultural policies and farm structures – Agent-based modelling and application to EU-policy reform, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Bd. 30,* Halle (Saale).

JUDD, K. L. (1997): Computational economics and economic theory: Substitutes or complements?, *Journal of Economic Dynamics and Control*, *Vol. 21,* pp. 907-942.

MASKIN, E., DASGUPTA, P. (1986): The existence of equilibrium in discontinuous games II, *Review of Economic Studies*, *Vol. 53 (1),* pp. 27-41.

MITCHELL, M. (1996): An introduction to genetic algorithm, MIT Press, Cambridge, Mass.

PHILPS, L. (1983): The economics of price discrimination, Cambridge University Press, Cambridge.

ZMP (2005): ZMP-Marktbilanz Milch, Zentrale Markt und Preisberichtsstelle (ZMP), Bonn.

SOCIAL NETWORKS AND GROUP LENDING

Milada Kasarjyan

1 PROBLEM STATEMENT AND MAIN ARGUMENT

In Armenia, the transformation following independence from the Soviet Union implied the decline of industries that were formerly the basis of the economy. With the decline of industry, the agricultural sector gained in importance in terms of value added as well as in employment for the people (BEZEMER and DAVIS, 2003).

Formerly, agriculture, along with the rest of the economy, was a centrally-planned system. With political changes, it was privatised and bureaucratic control was supposed to be substituted with market regulation. A functioning market requires the existence of certain institutions, like the acceptance of private property and trust in contracts and legality, especially with regard to savings and credit. In Armenia, like in all other transitional and developing countries, these institutions[1] were lacking. In fact, "transformation" in this work is defined with regards to the rise of such institutions as the "institutionalization of a market economy". Thus, the new institutions linked to the market economy, like banks, etc., were themselves embedded in extra-economic relations. Consequently, the interactions between financial institutions and farmers were less defined by legality, upon which it is possible to base economic calculations, than mutual distrust. As a result, these financial institutions were neither used by farmers for savings, nor did they trust the farmers to pay back credits. Not surprisingly, this led to difficulties for financing agricultural activities through common financial means (SWINNEN and GOW, 1997).

At present, access to financial services is, for the majority of peasant farms in Armenia (and in many other transition countries) quite problematic (SPOOR, 2004). If the established financial institutions do not work due to missing trust between the main actors (banks and farmers) microfinance[2] can be an intermediate solution. In contrast to most financial institutions, MFI do usually not work with individuals, but focus on credit groups. The idea is that individuals who belong to the target group of the typical MFI are poor and thus cannot provide physical collateral such as land. Furthermore, it is believed that this size of transaction is not profitable for commercial banks. Following the perspective that persons who are poor with regard to their monetary means might be in a better position with regard to their "social capital – networks of connected individuals", i.e., their social relations and forms of social organisation, MFI attempt to mobilise social capital to improve monetary possibilities.

2 METHODOLOGY

Social capital as networks of connected individuals is acknowledged in many definitions of the term. BOURDIEU (1986, pp. 243, 248) suggested that social capital is the value of social obligations or contacts formed through a network. Based on CÔTÉ (2001), "while human capital is embodied in individuals, social capital is embodied in relationships." According to Putnam (2000, p. 19), "social capital refers to connections among individuals – social networks and the

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[1] Institutions regulate action based on meaning. The meaning of institutions is based on everyday life, i.e., shared objectives that individuals attach to their respective actions.

[2] Microfinance is defined by the relative size of financial transactions with regard to per capita income. Normally, a micro-credit ranges from 50-200 % of per capita income, depending on the economic development stage of the country.

norms and reciprocity and trustworthiness that arise from them." Similarly, STONE (2001, p. 4) sees social capital "as networks of social relations which are characterized by norms of trust and reciprocity." We base our work on this micro-level definition of social capital, which emphasises the role of social networks and social ties as being the most relevant to microcredit programs.

The number and kinds of ties that actors have are keys to determining how much their embeddedness in the network constrains their behaviour, and the range of opportunities, influence, and power that they have (HANNEMAN, 2005).

This study relies on direct observations and group discussions with key persons, general information on the community and on semi-structured interviews with the main decision-makers from farm families. The research focused on the topics associated with the value, accessibility and use of existing social networks within rural communities. Moreover, the role of the networks in gaining individual access to productive resources, especially to agricultural credit, was identified. Furthermore, the factors hindering mutual monitoring and loan repayment in group-based projects were also studied. The software Ucinet was used to depict the social networks.

This contribution is based on field research among 33 private farmers in the Armavir province of Armenia in 2006. The so-called social network analysis focussed on farmers' access to agricultural MFI credit in relation to their social networks. The network analysis documents farmers' information flow, labour sharing, lending activities, and kinship relations in order to obtain an idea of the strength and role that networks play in determining access to group-based microcredit.

3 RESULTS

Results have shown that in the study area people are more likely to favour family members when it comes to interesting projects and other opportunities. This may be explained by the existence of a higher level of trust and norms of mutual obligation and reciprocity in a kin group. In the case of group-based lending projects, strong social relationships and family ties seem to play an important role in increasing one's access to credit and in enforcing credit repayment. It becomes obvious that the members of the community solve the problem of collective action through kinship relations. Consequently, the most basic and traditional sets of relations play an important role at this stage of transition in rural Armenia. It appears that existing conditions are such that community leaders and their families benefit from group-based lending projects the most. This is because extension and development agencies often seek community leaders as an effective point to start different programs and projects. Thus, households who have no kinship links to such key players may be access constrained. Hence, group loans are not a panacea for solving problems of credit access for everybody.

REFERENCES

BEZEMER, D., DAVIS, J. (2003): The rural-non farm economy in Armenia, Rural Non-Farm Project, Project No. V0165, *Report No. 2728,* Natural Resource Institute, UK.

BOURDIEU, P. (1986): The forms of capital, in: RICHARDSON, J. G. (ed.): Handbook of Theory and Research for the Sociology of Education, Cambridge University Press, New York, pp. 239-258.

CÔTÉ, S. (2001): The contribution of human and social capital, Isuma, *Canadian Journal of Policy Research 2, no. 1,* <http://www.isuma.net/v02n01/cote/cote_e.shtml>, accessed July 20, 2006.

HANNEMAN, R., RIDDLE, H. (2005): Introduction to social network methods.

PUTNAM, R. D. (2000): Bowling alone: The collapse and revival of american Community, Simon & Schuster, New York.

SPOOR, M. (2004): Land reform, poverty and inequality, A pro-poor approach to land policies, UNDP Armenia White Paper.

STONE, W. (2001): Measuring social capital, Australian Institute of Family Studies, *Research Paper No. 24.*

SWINNEN, J., GOW H. (1997): Agricultural credit problems and polices during the transition to a market economy in Central and Eastern Europe, Policy Research Group, Department of Agricultural Economics, *Working Paper No. 6.*

RURAL DEVELOPMENT AND WELFARE IMPLICATIONS OF CAP REFORMS FOR THE NEW EASTERN EUROPEAN MEMBER STATES

Marian Mraz and Marian Rizov

1 STUDY MOTIVATION AND OBJECTIVE

The EU Common Agricultural Policy (CAP) has been evolving from a policy framework established for the purpose to secure basic food availability, through farm commodity price support, into an integrated policy framework for rural development and environmental enhancement. The persisting heavy burden of the increasing budgetary outlays, increasing international pressure calling for substantial reduction of the existing distortionary support payments and remaining large market imbalances clearly underlined the need for a substantial policy reform. Furthermore the need for the CAP reform has been strengthened by the accession of 10 new EU member states, with relatively large agricultural sectors and complex rural development problems.

The three main pillars identified as the basis of the newly constituted CAP policies are i) competitiveness, ii) multifunctionality, and iii) sustainability[1]. In particular the multifunctionality which recognizes the full and diverse contribution of rural areas, including agriculture, to the society is to be acknowledged as an important advancement. From the perspective of the rural development clearly the concept multifunctionality is much broader than rural development concepts in earlier versions of CAP and involves all range of activities that farmers and the rural population as a whole might specialize in and contribute to the actual diversity of the rural communities. Taking into account the additional joint and spillover benefits such as rich wildlife habitat, biodiversity, and economically viable rural communities, the member states are willing to accept the persistence of support system, enhancing the multifunctional character of their agriculture. Besides political interests, academic research also motivates the idea that achieving optimal diversity of economic activities will enhance the rural development (HEAL, 1998; WEITZMAN, 2003).

International pressure for liberalization of agricultural trade within the framework of the WTO negotiations is another important factor in support to multifunctionality of rural areas. Various agricultural policies differ in terms of the levels of control and demands they face from the WTO partners. The policies are grouped into categories, referred as boxes, and differ in terms of their trade-distorting effects on the allocation of resources. WTO does not impose any constraints on policies with a minimal trade distortion such as the measures enhancing multifunctionality which are nominated as green-box policies. Nevertheless it is to be noted that the specific implications of the green box policies and related payments are still subject to discussions.

In this paper we model multifunctionality as a privately provided public good. We first review relevant public economics literature on private provision of public goods and the devise a model which we implement and simulate numerically in a general equilibrium framework. Most of the known economic models of public goods have been highly abstract and based on rather ad hoc simplistic assumptions on the costs structure of the provision of public goods. In this paper our objective is to extend the modeling framework in RIZOV (2004) into fully fledged static general equilibrium model of the real economy.

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[1] See STAVINS, WAGNER and WAGNER (2003) for a rigorous economic definition of the sustainability.

2 LITERATURE OVERVIEW

Since the early 1990 the discussion on agricultural polices has been broadened by a new concept of multifunctionality referring to the importance of the provision of the nonfood objectives usually classified by economists as externalities. It has been recognized that agriculture contributes beyond its primary concern of food and fiber supply. In particular agricultural activity contributes to landscape management, environmental benefits, in terms of land conservation, management of renewable resources and preservation of biodiversity (BOISWERT, 2001a). The key idea of multifunctionality is the presence of (unintended) side-effects or byproducts of agriculture adding to agriculture's overall contribution. Due to this character of the externality or the public good, farmers usually do not bear the full social costs of their activities related to negative side-effects.[2] In the same time, farmers cannot reap all of the benefits that the improvements of their activities bring.[3].

Substantial public economics literature has emerged on the neutrality results that the equilibrium would not be affected by the redistribution of income given public goods are provided on the private basis. Various aspects of the issue have been identified. Among others BERGRSTROM, BLUEME and VARIAN (1986) consider the case where some agents would withdraw from contribution. The neutrality theorem would not hold if the altruism of the agent is not "pure" as showed by ANDREONI (1989). By incorporating the productivity differentials into the model of private provision of public goods BUCHOLZ and CONRAD (1995) and IHORI (1996) show that the neutrality result does not hold as the agents with low-productivity in contributing to public good provision would gain by making a transfer to more efficient agents. Further, specifically for the case of agriculture, BOISWERT (2001a, b) emphasizes the joint production aspect, i.e., the externality and public good characteristics of the multiple outputs of agriculture and their implications for the policy formulations. Given these particular incites RIZOV (2004) demonstrates that the diversity at the level of the rural community can be characterized as a privately provided pure, non-excludable public good.

3 METHODOLOGY

We employ a standard static, multiregional computable general equilibrium model. For each region we define a system of zero profit and market clearance equations indicating the activity levels of each industrial sector and market prices for each market respectively. The production in each sector is represented using a typical nested structure of CES-type functions. At the bottom level a value added is defined as a Cobb-Douglas composite of capital and labor. At the higher stage the value added composite enters into the Leontieff nest with firm intermediate demands. All regions are mutually interlinked via international trade relationships modeled in Armington fashion (ARMINGTON, 1969). The CAP instruments of which income transfers from large commercial farmers to small farm and non-agricultural enterprises are explicitly incorporated into our model by using the approach proposed by WEYERBROCK (1998). They introduce the CAP related instruments in the form of price wedges and quantity constraints. This approach allows for a different treatment of the exogenous and endogenous as well as coupled and decoupled agricultural policies. The treatment of the multifunctionality of agriculture follows the exposition by CRETEGNY (2002). The multifunctionality is defined as privately provided public good and is modeled in the framework of joint production, of a pure public good and an agricultural-production private good. The private provision of the public good corresponds to the desired level of direct payments by CAP. In a similar vein to the production

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[2] Negative side effects are, e.g., soil erosion, water depletion, deforestation or groundwater pollution.

[3] There are number of environmental improvements resulting from farm activities that contribute to recreational quality of the countryside, improved flood quality control, and open space management.

process the final demand of the representative households follows a CES expenditure function defined over the composite of Armington goods and public good representing the value of the multifuntionality. Here we extend the CRETEGNY's (2002) framework and incorporate a development function linking together the relative efficiencies of rural producers in with their contribution to the provision of the public good. In each region the government serves for redistribution of the fiscal revenues and targeting the agricultural policies. The model has been calibrated by inverting the first order conditions, setting all variables equal to their benchmark levels and solving for the model parameters. The model has been calibrated using the most recent GTAP[4] version 6 database with a benchmark year 2001. The GTAP database does also provide the values of the substitution elasticities.

4 RESULTS AND CONCLUSION

Our simulations mimic well the proposed CAP reform, which in fact implies effective shift of resources from the large commercial farmers to smaller noncommercial farmers and rural non-farm households in general. The initial results indicate a somewhat negative impact of the CAP reform on farmers who will face more fierce competition and thus lower internal market prices. On the other hand the non-farm households, however, turned out to benefit from further liberalization of the agricultural trade. Assessment of the overall welfare effects remains ambiguous. It remains conditional on the treatment of benefits delivered by the surplus of public goods. Having omitted the benefits derived from consumption of the public good to enter as an argument in the individual household utility function implies a negative overall welfare impact of the reform. However, having the benefits of public goods considered would importantly change the result. Moreover conditional on the shape of the rural development function and the relative efficiencies of rural producers in contributing to multifunctionality, within the modeling framework, the large farmers do not necessarily face a deterioration of welfare, following the resource reallocation towards small farms and non-agricultural rural enterprises implied by the reform.

REFERENCES

ANDREONI, J. (1989): Giving with impure altruism: Application to charity and Ricardian equivalence, *Journal of Political Economy, 97 (6),* pp. 1447-1459.

ARMINGTON, P. S. (1969): A theory of demand for products distinguished by place of production, *International Monetary Fund Staff Papers, 16 (1),* pp. 159-178.

BERGRSTROM, T., BLUEME, L., VARIAN, H. (1986): On the private provision of public goods, *Journal of Public Economic, 29 (1),* pp. 25-49.

BOISWERT, R. (2001a): A note on the concept of jointness in production, in: Multifunctionality: Towards an analytical framework, annex 1, OECD, Paris.

BOISWERT, R. (2001b): Joint production in four outputs: Two commodities and positive and negative externalities, in: Multifunctionality: Towards an analytical framework, annex 2, OECD, Paris.

BUCHOLZ, W., CONRAD, K. (1995): Strategic transfers and private provision of public goods, *Journal of Public Economics, 57 (3)*, pp. 489-505.

CRETENY, L. (2002): Modeling the multifunctionality of agriculture in a CGE framework, in HEAL, G. (1998): Valuing the future: Economic theory and sustainability, Columbia University Press, New York.

[4] GTAP – Global trade analysis project, provides a world wide multi-sectoral database serving as a basis for computable general equilibrium models. The database is substantial collection of the SAM matrices of 87 regions world wide.

IHORI, T. (1996): International public goods and contribution productivity differentials, *Journal of Public Economics, 61 (1),* pp. 139-154.

RIZOV, M. (2004): Rural development and welfare implications of CAP reforms, *Journal of policy modeling, 26,* pp. 209-222.

STAVINS, R., WAGNER, A., WAGNER, G. (2003): Interpreting sustainability in economic terms: Dynamic efficiency plus intergenerational equity, *Economics letters, 79 (3)*, pp. 339-343.

WEITZMAN, M. (2003): Income, capital and the maximum principle, Hardvard University Press, Cambridge, MA.

WEYERBROCK, S. (1998): Reform of the European Union's common agricultural policy: How to reach GATT-compatibility, *European Economic Review 42 (2),* pp. 375-411.

OBLIGATORY AND VOLUNTARY STANDARDS IN POLISH MEAT PRODUCTION/PROCESSING

Marcin Preidl and Marie-Luise Rau

1 INTRODUCTION

With the eastward enlargement of the European Union (EU) in May 2004, the new member states of Central and Eastern Europe took over the entire body of EU rules and regulations (*aquis communitaire*). Although the alignment of regulations began during the preparation for EU membership, implementation and enforcement of the tight EU agri-food standards does not yet fulfil the requirements at all levels. That is particularly true for Polish meat production/ processing, where substantial deficiencies, especially in meeting the EU hygiene and veterinary standards, still exist (CENTRAL STATISTICAL OFFICE OF POLAND, 2005).

The reasons for the unsatisfactory state of compliance with EU standards in the Polish meat sector are manifold. By all accounts, the costs incurred when meeting the tight EU standards can certainly be expected to play a crucial role. Due to the difficulties involved, only few attempts have been undertaken to quantify the costs of complying with EU standards. To our knowledge, the only study estimating adjustment costs in Polish meat production/processing was conducted by the POLISH MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT (2000).

This paper deals with the adjustment process in Polish meat production/processing and the problems involved from the producers/processors' point of view. Specifically, the paper aims to quantify compliance costs in the Polish meat sector. Additionally, information about the significance of voluntary standards, as opposed to the mandatory EU standards, for the Polish meat sector shall be given.

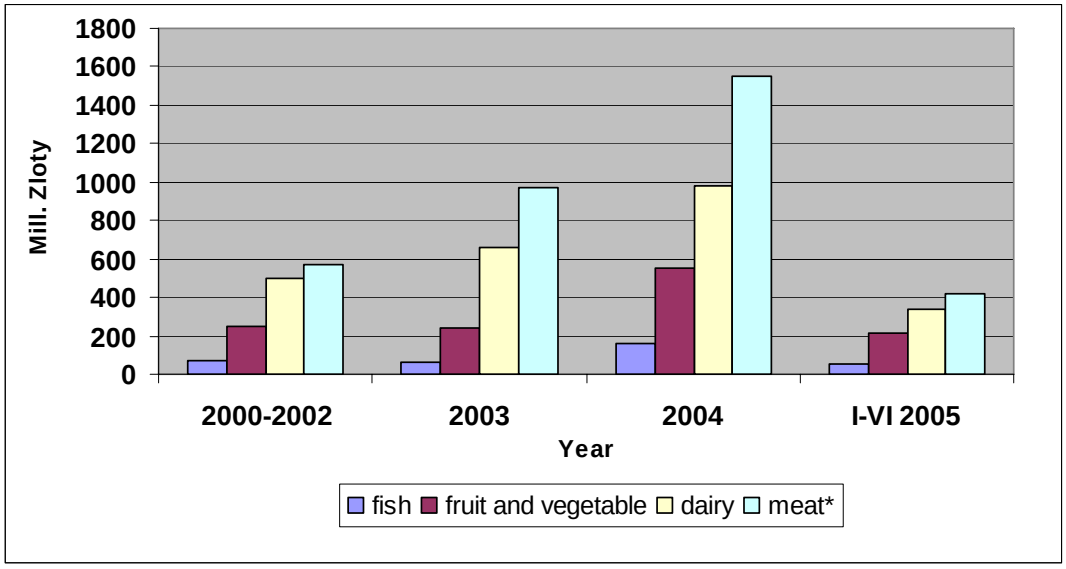
2 BACKGROUND

The meat sector plays a relatively important role in the Polish agri-food industry. In 2005, the Polish meat sector generated about a quarter of the total value-added of the entire Polish agri-food industry (IERIGZ, 2005). The economic importance of the Polish meat sector is also exhibited by the large number of people working in it; about a quarter of the entire workforce in the Polish agri-food industry is employed therein (IERIGZ, 2005).

Polish meat production/processing is characterized by a large number of small and medium-scale firms, which has caused specific problems for the sector. For example, due to the unused capacities in small and medium production farms, the profitability of a lot of the firms is rather low. Especially these low-capacity firms suffer from a general lack of liquidity.

However, the years shortly before Poland's EU accession, as well as the accession year, led to extensive changes in Polish meat production/processing. During that time, investments for modernization and the adoption of EU standards continuously grew. In 2004 these costs amounted to a record sum of 1.5 billon Zloty (about 380 million Euros) (IERIGZ, 2005). Figure 1 illustrates this enormous increase of investments. As shown in the figure, investments in the meat sector have been substantially larger than those in other sectors of the Polish agri-food industry.

Figure 1: Investment in Polish food production/processing



Source: Own illustration based on data by IERIGZ (2005).

Note: * Refers to red meat only.

With the increase of investments, the number of Polish firms that meet the EU standards has tremendously increased. Again, in comparison to other sectors, the changes in compliance are most prominent in the Polish meat sector. That is depicted in Table 1, which shows the number of Polish meat firms that produce in accordance with directive 64/433/EWG (OJ P121, 29.7.1964) and 77/99/EWG (OJ L26, 31.1.1977) on placing fresh and processed meat/meat products on the EU market. The two directives specifically define the veterinary and hygiene requirements that meat firms have to fulfil so as to sell their produce on EU markets. Hence, the compliance with these EU standards determines the access of Polish meat firms to the EU market.

In addition to mandatory EU standards, voluntary private standards play an important role in the EU. That is, EU firms and/or retailers increasingly set their own private standards which typically exceed the requirements of the public, mandatory EU standards. These private standards are voluntary by nature but can become quasi-mandatory if, at certain stages of the value chain, a large share of actors demands compliance with their private standards (HENSON and REARDON, 2005). Despite the significance of such private standards, only a very small number of Polish meat firms currently produce according to them (IERIGZ, 2005).

Table 1: Number of Polish meat firms* licensed for EU-export

Sector	January 2004	March 2005	October 2005
Meat **	**61**	**638**	**705**
Dairy	55	220	245
Fish	62	167	190

Source: IERIGZ (2005).

Notes: * Refers to meat production/processing and slaughterhouses.** Refers to red meat only.

3 METHODOLOGY

In order to obtain first-hand information about the costs of complying with EU standards and the adjustment process in the Polish meat sector, a survey was conducted. In the Wielkopolska region, twenty-three meat production/processing firms that qualify for selling their produce on the EU market were visited.[1] However, so far only nine of them have participated in the interviews. This shows the extraordinary delicacy of the topic. The questionnaire used in the interviews contains questions about the costs of complying the EU hygiene and veterinary standards of directives 64/433/EWG and 77/99/EWG, as well as the firms' difficulties in meeting them. It also covers, to a certain extent, voluntary standards.

4 FIRST RESULTS

All of the firms interviewed in the survey began their adaptation of the EU standards in 2002/03, and eventually managed to comply with them in 2004, the year of accession. According to the firms interviewed, the costs of complying with the EU standards were dependant on the initial situation of the respective firm.

Compliance costs can add to the fixed or variable costs of production (RAU and VAN TONGEREN, 2006). Additional fixed costs incur when firms have to undertake investments so as to meet the required standards. The survey results show that the on-site investments for upgrading production facilities according to EU standards have been considerable. The small and medium-scale firms interviewed report investment costs of up to 4 million Zloty. Due to their lack of liquidity, these firms experienced difficulties in undertaking these investments. In contrast, benefiting from the foreign direct investment by German/Italian partners, two of the interviewed firms had no difficulties with the investments required to meet the EU standards and hence consider their compliance process less challenging. Surprisingly, only three of the interviewed firms financed their investments with the financial support of the EU's Special Accession Programme for Agriculture and Rural Development (SAPARD).

According to the results of the survey, adopting to EU standards has also led to higher variable production costs. That seems to contradict the general perception that standards advancing the production technology of rather traditionally-operating firms, which characterizes the majority of the Polish meat firms, improve production efficiency and hence lower average variable costs of production. The interviewed firms stated that the implementation of HACCP, which prescribes frequent controls, detailed documentation and record-keeping at all production levels, has substantially increased their variable costs of production. Furthermore, due to HACCP, new high-skilled staff had to be employed. In only four of the interviewed firms has complying with EU standards made production more efficient. In general, the cost increase in terms of compliance costs tends to be compensated by a larger sales volume and the possibility of exporting to the EU market, where higher prices can be obtained.

Concerning private standards, four of the interviewed firms comply with the voluntary ISO standard and one of these firms also applies the standards of the British Retail Consortium (BRC). It seems that these voluntary standards are particularly relevant for processed meat products, rather than for fresh meat. Delivering their produce to further processing, the interviewed Polish slaughterhouses consider them as rather unimportant.

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[1] The General Veterinary Inspectorate of Poland provides a list of all Polish meat firms with an EU export licence. This list is available online under <http://www.wetgiw.gov.pl>.

REFERENCES

CENTRAL STATISTICAL OFFICE OF POLAND (2005): Statistical yearbook of agriculture and rural areas, Warszawa.

HENSON, S., REARDON, T. (2005): Private agri-food standards: Implication for food policy and the agri-food system, *Food Policy, 30,* 241 pp.

IERIGZ (2005): Stan polskiej gospodarki żywnościowej po przystąpieniu do Unii Europejskiej, Raport 2, Warszawa.

IERIGZ (2005): Systemy zarządzania jakością w przedsiębiorstwach przemysłu spożywczego, Warszawa.

POLISH MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT (2000): Strategy and operational programme of restructuring development of meat industry in Poland within the period of Poland's integration with the European Union, Warszawa.

RAU, M.-L., VAN TONGEREN, F. (2006): Modelling differentiated quality standards in the agri-food sector: The case of meat trade in the enlarged EU, Contributed paper at the 26th Conference of the International Association of Agricultural Economist (IAAE), Brisbane/Australia, 12.-18.08.2006, (forthcoming).

BANKING EFFICIENCY AND FOREIGN OWNERSHIP IN TRANSITION: IS THERE AN EVIDENCE OF A "CREAM-SKIMMING" EFFECT?

Tigran Poghosyan and Jaroslav Borovicka

1 STUDY MOTIVATION AND OBJECTIVE

Efficiency of banking institutions is of a paramount importance for economic development in transition economies (ANDERSON and KEGELS, 1998). A more efficient banking system facilitates financial intermediation and contributes to optimal allocation of financial resources in the real sector. In transition countries the banking sector plays even more important role in the process of reallocation of financial resources than in developed countries, since other elements of the financial sector are still underdeveloped (EBRD, 1998).

The determinants and factors driving efficiency of banking institutions are various: Ranging from bank-specific (e.g. ownership, bank capitalization, share of loans in total assets) to country-specific (e.g. per capita GDP, interest rate, market liberalization reforms). In this paper, we focus on foreign ownership as an important determinant of banking efficiency in transition economies. Theoretical prediction on the direction of the ownership impact is not straightforward. On the one hand, foreign banks benefit from the advantages related to their access to more advanced information. On the other hand, domestic banks have better idea on how domestic economy works, understand the specifics of domestic legal systems, traditions and other aspects of domestic institutions, which mitigates the negative impact of asymmetric information on their performance relative to their foreign counterparts.

The prevailed view in the empirical literature on banking in transition suggests that banks acquired by a strategic foreign partner tend to do better in terms of cost efficiency (see YILDIRIM and PHILIPPATOS, 2002; ROSSI et al., 2004; BONIN, HASAN and WACHTEl, 2005 and FRIES and TACI, 2005). Only few papers provide empirical evidence suggesting that foreign ownership in fact has a negative impact on efficiency, but these studies are based either on cross-country data from developed countries (BERGER et. al., 1999), data from a set of developing economies with only small share of transition countries (LENSINK et. al., 2006) or single-country data (see KRAFT and TIRTIROGLu, 1998; MATOUSEK and TACI, 2002).

One challenge in evaluating the impact of foreign ownership on efficiency is the possibility of endogeneity bias due to the so-called "cream-skimming" effect. The last term corresponds to a situation when foreign investors tend to acquire the most efficient banks in the first place. By this argumentation, privatization to foreign investors does not add much in terms of efficiency to a particular bank, as the privatized banks would perform well even if they have had stayed in domestic ownership.

Surprisingly, the "cream-skimming" effect has not been given appropriate attention in the empirical literature on banking efficiency in transition. This paper tries to take up the challenge and shed some light on the true effect of foreign ownership on banking efficiency by employing two-step instrumental variable approach. The results of our study can be used by policymakers for developing liberalization strategies and opening domestic banking systems for foreign entry.

2 METHODOLOGY

In our study, we adopt stochastic efficiency frontier approach for studying cost efficiency of banks in transition economies. Cost efficiency measures relative performance of a bank by comparing its costs to the efficiency cost frontier for a given technology. Since technologically

feasible cost frontiers are not observable, in practical applications the measurement of cost efficiency is based on deviations from a minimal costs observed in a dataset.

Using a sample of 229 banks from 18 transition countries we employ two-stage instrumental variable approach. In the first stage, we estimate probability of foreign acquisition by implementing panel probit model. In the second stage, the estimated propensity scores are used in the BATTESE and COELLI (1995) stochastic efficiency frontier model specification with time varying inefficiency terms.

In order to evaluate the presence of the "cream-skimming" effect we estimate stochastic efficiency model consistent with the stochastic efficiency frontier specification employed in previous panel data studies on transition banking. The estimation results from this specification are then compared to the two-stage instrumental variable outcomes. In addition, we compare the size of estimated inefficiency scores for both specifications. Finally, we check for the robustness of our results to the distributional assumptions imposed in the first stage by conducting panel linear regression instead of the panel probit model.

3 RESULTS AND CONCLUSIONS

Comparison of estimation results from specifications with and without instrumental variables indicate that instrumental variable approach reverses the sign of the impact of foreign ownership on banking efficiency from positive to negative. This finding indicates that in transition economies the "cream-skimming" effect is significant, which predicts that foreign investors tend to acquire the most efficient banks in the first place. Sign reversal takes place for both probit and linear regression specifications, which implies robustness of the result. In addition, the two-stage instrumental variable model produces inefficiency scores almost two time less in comparison to the ones in the model without instruments.

The general conclusion coming from our study is that massive privatization of domestic banks to the foreign owners would not necessarily imply improvement of the banking system performance. We would like to emphasize however, that this should not be mixed with the contribution of foreign ownership to the enhancement of stability of financial system, since efficiency and stability of banking institutions are different concepts.

REFERENCES

ANDERSON, C., KEGELS, C. (1998): Transition banking: Financial development of Central and Eastern Europe, Clarendon Press, Oxford, GB.

BATTESE, G., COELLI, T. (1995): A model for technical inefficiency effects in a Stochastic Frontier Production Function for panel data, *Empirical Economics, 20,* pp. 325-332.

BERGER, A., DEMSETZ, R., STRAHAN, P. (1999): The consolidation of the financial services industry: Cause, consequences, and implications for the future, *Journal of Banking and Finance*, *23,* pp. 135-194.

BONIN, J., HASAN, I., WACHTEL, P. (2005): Bank privatization and performance: Evidence from transition countries, *Journal of Banking and Finance*, *29,* pp. 31-53.

EBRD (1998): Transition report: Financial sector in transition, European Bank of Reconstruction and Development, London.

FRIES, S., TACI, A. (2005): Cost efficiency of banks in transition: Evidence from 289 Banks in 15 post-communist countries, *Journal of Banking and Finance, 29,* pp. 55-81.

KRAFT, E., TIRTIROGLU, D. (1998): Bank efficiency in Croatia: A Stochastic-Frontier Analysis, *Journal of Comparative Economics, 26,* pp. 282-300.

LENSINK, R., MEESTERS, A., NAABORG, I. (2006): Bank efficiency and foreign ownership: Does good governance matter?, Unpublished Manuscript, University of Groningen.

MATOUSEK, R., TACI, A. (2002): Banking efficiency in transition economies: Empirical evidence from the Czech Republic, *Discussion Paper No. 2-3,* Centre for International Capital Markets, London Metropolitan University.

ROSSI, S., SCHWAIGER, M., WINKLER, G. (2004): Banking efficiency in Central and Eastern Europe, *Financial Stability Report, OeNB, 8,* pp. 77-91.

YILDIRIM, S., PHILIPPATOS, G. (2002): Efficiency of banks: Recent evidence from the transition economies of Europe, 1993-2000, Unpublished Manuscript, University of Tennessee.

LABOR AND CAPITAL ADJUSTMENT IN THE COURSE OF EU ACCESSION: AN AGENT-BASED ANALYSIS OF A STUDY REGION IN SOUTH WEST SLOVAKIA

Hauke Schnicke

1 STUDY MOTIVATION AND OBJECTIVE

Agrarian employment in the New Eastern Member States (NEMS) has been affected by drastic restructuring processes which were caused by a general decline of agricultural production, changes in product structure, rationalization and the replacement of manual work by capital-intensive technological equipment. In Slovakia, agriculture accounts for about 8 % of total employment, and exhibits a decreasing trend. Regarding capital inputs, there is now, after a long period of rather reserved investment strategies, a trend of increasing investment activities on the primary production level (STATISTICAL OFFICE OF THE SLOVAK REPUBLIC, 2005). To some degree, both trends may be independent of the agricultural policy framework, but in the course of EU accession, there is more attention paid to the impact analysis of diverse agricultural policy measures regarding input adjustments, regardless of whether these measures are financed by the EU or by national funds.

As a country under the sphere of the Common Agricultural Policy (CAP), it can be assumed that the CAP constitutes more than a simple rule-setting legal framework for Slovakia, but that it also sends out a number of various market-influencing and distorting signals itself (e.g. OECD, 1994). Regarding EU accession, the Slovakian decision-makers opted to implement a simplified Single Area Payment Scheme (SAPS) which includes additional coupled Complementary National Direct Payments (CNDP).

This study analyses the interactions between the introduction of the SAPS and CNDPs regarding structural change, with a particular focus on labor and capital input adjustments. The study region "Nitra", located in the southwest of Slovakia, is one of the country's eight districts and covers approximately 100 km x 100 km. The region is characterized by a continental climate with favorable production conditions and above-average yields on flat plains of mostly chernozem soil types. Therefore, the land is quite intensively used as arable land, garden, vineyard and hop-gardens, as shown in Table 1 below.

Table 1: Use of area in the Nitra region 2001 (ha and percent)

Use of area	in ha	in %
Arable land	359,102	86.6
Permanent grassland	27,368	6.6
Garden	12,440	3.0
Vineyards	10,781	2.6
Orchards	4,561	1.1
Hop-gardens	416	0.1
Total (total UAA)	414,668	100.0

Source: Structural Census of Farms 2001 (Census, 2001).

Regarding distribution into different farm size classes, a dualism of agricultural structure is often alluded to in Slovakia. On the one hand, there exist a lot of small-scale, individual subsistence and semi-subsistence farms which provide a kind of "social buffer in rural areas" (PETRICK and WEINGARTEN, 2004). On the other hand there are market-orientated large-

scaled farms organized as co-operatives, limited liability companies and joint stock companies. These legal entities manage about 82 % of the land, but account for only 2 % of all farms (STATISTICAL OFFICE OF THE SLOVAK REPUBLIC 2002, Census, 2001).

Table 2: Number of farms in different size classes (total number and percent)

Size class	Total number	in %
< 0.5 ha	9,395	56.0
0.5 - 1 ha	2,842	17.0
1- 5 ha	3,060	18.2
5 - 10 ha	419	2.5
10 - 50 ha	519	3.1
50 - 100 ha	157	0.9
100 - 500 ha	198	1.2
500 - 1,000 ha	68	0.4
> 1,000 ha	126	0.8
Total	16,784	100.0

Source: STATISTICAL OFFICE OF THE SLOVAK REPUBLIC (2002): Structural Census of farms 2001.

2 METHODOLOGY

To handle and quantify single farms' and the agricultural sector's adjustment reactions in response to agricultural policy changes, agent-based modelling approaches have arisen as an analysis tool in recent years (e.g. HAPPE et al., 2006; PARKER et al., 2003; BERGER, 2001). By tracing individual farms' re-allocation processes, this approach also allows researchers to draw conclusions on an aggregated prospective structural development level. The agent-based model AgriPoliS (HAPPE et al., 2006; HAPPE, 2004) has been adapted to the study region by representing the regions' agricultural structure based on regional statistics, farm accounting data and specific standard technical data. The inclusion of regional peculiarities leads to a regionalized analysis tool which contributes to aspects like land immobility, farm heterogeneity, interactions between farms, space, exogenous price trends and dynamic adjustment processes. The model interprets an agricultural region as a complex, evolving system with autonomously-acting farm-agents that sense and interact with their environment and which can carry out actions and follow specific behavioral patterns. Within AgriPoliS the study region is represented by typical farms that are weighted by farm-specific scaling-factors derived from an upscaling procedure. The outcome of this procedure are a number of farms which approximate the region's characteristics as best as possible.

Table 3: Representing the study region (Extract)

General characteristics	Regional Data	Considered/ adjusted data	Upscaling results	Deviation
Number of farms	16,973	1,342	1,292	-4 %
Utilized agricultural area (UAA; ha)	414,668	387,909	372,408	-4 %
Number of beef cattle older than 1 year	15,336	8,576	8,508	-1 %
Number of dairy cows	36,847	35,400	36,551	3 %
Breeding sows with more than 50 kg	38,691	36,681	34,423	-6 %
Fattening pigs with more than 20 kg	203,085	168,318	174,200	3 %
Structural characteristics				
Area (ha)				
Arable land	381,542	366,820	350,268	-5 %
Grassland	22,182	21,089	22,140	5 %
Organizational form				
Number of individual farms	16,654	1,090	1,043	-4 %
Number of holdings	319	252	249	-1 %
… continuation of structural characteristics …	…	…	…	…

Sources: STATISTICAL OFFICE OF THE SLOVAK REPUBLIC (2002): Structural Census of farms 2001.

Notes: [1)] Excluded all farms smaller than 5 ha.

3 STUDY RESULTS (EXTRACT)

The study results very much depend on the performance of calibrating and validating model-specific assumptions, as well as assumptions concerning regional-specific data. An appropriate model of the farms' internal organization, inter-farm relations, and the surrounding economic environment will be the main result of the study.

Regarding concrete results, it can be concluded that ongoing trends of intra-farm adjustments and restructuring are – to a certain extent – independent of the agricultural policy framework in which farms are embedded. Identifying and quantifying the respective extent and possible boundary values will be an integral part of the study. To some degree, policy-independence is also valid for tendencies of labour-input reduction and productivity increases of the remaining labour units. The results provide a significant hint that EU-accession induces ascending incomes per working units. Considering capital input adjustments, the increased level of disposable liquidity causes the substitution of labor with capital to be accelerated.

REFERENCES

BERGER, TH. (2001): Agent-based spatial models applied to agriculture: A simulation tool for technology diffusion, resource use changes and policy analysis, *Agricultural Economics,* 25, *2-3,* pp. 245-260.

PARKER, D. C., MANSON, S. M., JANSSEN, M. A., HOFFMANN, M. J., DEADMAN, P. (2003): Multi-agent systems for the simulation of land-use and land-cover change: A review, *Annals of the Association of American Geographers, 93, 2,* pp. 314-337.

HAPPE, K. (2004): Agricultural policies and farm structures – Agent-based modelling and application to EU-policy reform, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 30,* Halle (Saale).

HAPPE, K., KELLERMANN, K., BALMANN, A. (2006): Agent-based analysis of agricultural policies: An illustration of the agricultural policy simulator AgriPoliS, its adaptation, and behavior, *Ecology and Society, 11(1),* p. 49, [online], URL: <http://www.ecologyandsociety.org/vol11/iss1/art49/>.

OECD (1994): Agricultural policy reform: New approaches – The role of direct income payments, Paris.

PETRICK, M., WEINGARTEN, P. (2004): The role of agriculture in Central and Eastern European rural development: Engine of change or social buffer?, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 25,* Halle (Saale).

STATISTICAL OFFICE OF THE SLOVAK REPUBLIC (2002): Štrukturálny cenzus fariem 2001 [Structural census of farms 2001], Statistical Office of the Slovak Republic, Bratislava.

STATISTICAL OFFICE OF THE SLOVAK REPUBLIC (2005): Sample survey on labour force, Statistical Office of the Slovak Republic, Bratislava.

REGIONAL DEVELOPMENT IMPACT ON AGRICULTURAL ENTREPRENEURIAL ORIENTATION: A ROMANIAN CASE-STUDY

Monica Mihaela Tudor

1 STUDY MOTIVATION AND OBJECTIVE

The presence of the entrepreneurial spirit in a great number of rural households is a measure of market economy penetration in a production area. The present study intends to establish what types of agricultural entrepreneurial behaviors are characteristic for two competing development regions and how their antagonism influences the entrepreneurial activities in the Romanian rural space. We define *the area of entrepreneurial behaviors in agriculture* by the following main characteristics: *The sale of products and obtaining profit*; use *of modern technologies and inputs*; *investment* flows (already in place or/and intended for the future); tendency to *increase farm size* by purchasing animals, buying and/or leasing in certain land areas.

2 METHODOLOGY

The idealized entrepreneurial image in the farming sector can take, from the behavior standpoint, a multitude of forms, defined by a combination of entrepreneurial behavior signs in different proportions. Household typology measuring the extent to which they have or have not adopted active entrepreneurial attitudes differentiates four main categories of farmers in the Romanian rural sector:

- *Fully subsistence farmers* – using traditional techniques and producing only for their own self-consumption;
- *Partial subsistence farmers* – using minimum inputs, selling a small part of their production output, i.e., the small amounts of production surplus remaining after the household's own consumption;
- *Total entrepreneur* – maximizes the investments, sales and procurement of production means, in order to obtain a longer-term profit;
- *Partial entrepreneur* – represented by the trader focusing on sales and oriented towards profit on a shorter term. The rate of production entries, although higher than average, is relatively low. Sales have a more intense rate than entries, which define the type of profiteer entrepreneur.

The study is based on a field survey[1] conducted in 2002 in two Romanian rural areas (commune Tartasesti, Dambovita County and the communes Daia, Oinacu and Fratesti, Giurgiu County) that benefit from relatively similar situations from the perspective of agricultural land area suitability for the development of farm activities, and accessibility to urban agrifood markets. The commune from Dambovita County is located in a rural area in which the factors favoring rural development prevail, while the communes from Giurgiu are located in a "poverty pocket".

[1] The field survey was conducted by researchers of the Rural Economy and Sociology Department from the Institute of Agricultural Economics, Bucharest.

3 STUDY RESULTS

From the perspective of elements defining an "area of entrepreneurial behaviors" (trade, modern inputs, investments) we can interpret the position of the entrepreneurial class of investigated communes as being "suspended" between partial subsistence agriculture and partial entrepreneurship. These positions are justified by the entrepreneurial configuration specific for each area. Thus, while in Tartasesti more than 22 % of households develop commercial activities, for the communes from Giurgiu, this indicator is less than half, i.e., 9.6 %, compared to the area from Dambovita County.

In Tartasesti, a relative *specialization in vegetable farming* is noticed on commercial farms, resulting in a higher value of sales compared to the areas from Giurgiu County, where the farms have rather sporadic and non-specialized commercial activities.

The endowment in agricultural equipment of households is scarce in all the investigated communities; it is more deficient in Giurgiu, where only 4.8 % of households have a tractor, compared to 7 % in the commune from Dambovita.

At the level of the commune from Dambovita County, 4 % of the inquired persons made investments in agricultural equipment and have an almost complete range of machines and devices, but the value of these investments is very low, showing the speculative nature of the entrepreneurial behaviors. For Daia, Oinacu and Fratesti the endowment with agricultural equipment of the households registers a more substantial deficit than in Tartasesti – 4.8 % of the households have only a tractor and plough. A 2.4 % share of the respondents of the three Communes from Giurgiu County made investments in agricultural equipment during the previous year; with an average value of € 2,800, these investments get the households they supported closer to the type of a *total entrepreneur*.

Agricultural inputs are used in quite a large number of households in both areas; however, the appetite for using agricultural inputs is decreasing, both as a share in total user holdings and as value – from certified seeds to fertilizers and pesticides on one hand due to budgetary constraints; on the other hand, out of a willingness to obtain maximum results with a minimum of effort, which runs the risk of soil exhaustion in nutrients and infestation with different pests and weeds that will negatively affect the efficiency of land operation in the future. This passive strategy of making agricultural business is the result of the dominant attitude of "PRO maximal state"[2], through which the state should intervene in order to control economic activities, should financially support agriculture, and take care of the production's sales.

In the commune from Dambovita County, a manifest interest is noticed for the growth of commercial farms, while the localities of Daia, Oinacu şi Fratesti are rather characterized by a lack of interest in the development of this business type. While for Tartasesti a great agricultural business potential is found – 21 % of the investigated persons are willing to develop a farm business in the future and another 13 % intend to buy agricultural land. For Giurgiu's localities, the potential for intentional activation in agricultural business is very small, with only 2.4 % of the investigated households wishing to purchase land in future or to improve their productive actions. Moreover, none of the respondents intend to open an agricultural business and only 3.6 % of them wish to open a non-agricultural business. The main obstacle invoked by most of respondents is the lack of necessary funds for initiating such a business, together with the difficulty in obtaining a bank loan.

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[2] SANDU, D. (1998): Spatiul social al tranzitiei, Polirim, Iasi, pp. 52-55.

The correlation between the economic and social development of the investigated areas and the other two elements considered to be entrepreneurial orientation predictors, i.e., occupational status of household head[3] and the size of land property, aims to test the way in which these two elements condition each other; this means revealing the cumulative conditions that can increase farm entrepreneurial actions.

In conclusion, the degree of community-regional development involves different evolutions in entrepreneurial behaviors. The economic dynamics of the proximity zone in which a rural community is placed exercises a motivational process upon agricultural initiatives. Thus, a zone possessing favorable factors for development (Dambovita County) exercises a greater conformity pressure on rural households, stimulating agricultural potential and the goal of improving income levels. In areas with low development, economic dynamics are slow and induce the rural households production activities to exhibit a more subsistence character.

[3] The occupational typology was established in function of the stated occupation of the head of household.

MAJOR SHIFTS IN ROMANIAN FARM STRUCTURES AND THEIR IMPACT ON CROP PRODUCTION: SCENARIOS FOR IMPROVING LAND USE MANAGEMENT

Crina-Sînziana Turtoi

1 STUDY MOTIVATION AND OBJECTIVE

Romanian agriculture experienced major shifts in its farming structures after 1990, which is also reflected in its production structures. In addition, agricultural land restitution generated a dual structure in farmland operations, fragmented among small and very small family farms at one extremity, and compacted in large and very large farms at the other.

While agricultural policy which focused mainly on supporting agricultural production and liberalising the trade of agri-food products, was constantly oriented towards providing support to larger farms, generally with a legal status, less attention was bestowed to family farms, which were often disqualified from development and financial support programs.

With family farms producing an estimated 74 %[1] of the total output from crop production, the sector still has to improve its productivity in order to be competitive in the enlarged European Union. As the structural reforms did not target the restructuring of down and upstream sectors in accordance with the needs of the small individual holdings, the input and output markets were not fitted to farmers' requirements. Further, the declining trend of agricultural production and gross value added increased both the relative and absolute gap among Romanian and Member States' agriculture (POPESCU, 2001).

According to the results of the 2002 general census of agriculture, family farms utilize 55.3 % (7709 thou hectares) of the total agricultural area of the country. Of this share, 52 % is utilized only for own consumption by almost 77 % of the family farms, 41 % is utilized by 21 % of the family farms that occasionally market their surplus, while only 7 % of the agricultural area is utilized by the rest of the 2 % of the family farms for obtaining a production that is mainly market-oriented (TURTOI and TOMA, 2006). Furthermore, the low productivity is influenced by an excessive agricultural labor force occupied in agriculture, which represents 31.6 % of the total employed population of the country[2].

Crop yields are low in Romania and the country's agriculture labor productivity is among the lowest in the region (CSAKI and KRAY, 2005). Labor productivity in the EU was about 14 times higher than that of Romania. Under the uncertainty which characterizes agricultural production, from the quantitative and qualitative point of view, the limited access of agricultural producers to bank loans, which is mostly determined by the high level of the interest, kind and value of the guarantee requested, represents an important hurdle for the competitive development of viable agricultural holdings.

To increase the sector's competitivity, agricultural policy must confer more support to semi-subsistence farms to turn them into viable, trade oriented farms that are able to meet the challenges of the vertical chains. Implementing the Common Agricultural Policy will bring important changes in both agricultural producer and consumer behavior, as well as in budget allocation. The new legislative package that was issued in the beginning of 2006 dealt with financing investments in agriculture, and although it came somewhat late, the legislation certified larger facilities for approaching and absorbting the European pre-accession funds by

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1 As in year 2004.

2 Year 2004, tab. 3.3 şi 3.6, Romanian Yearbook – 2005, edited in 2006.

all types of farmers, but especially young farmers. This may result in equitable rural space development, but also in the increase of the family holdings' competitiveness.

The objective of the present paper is to identify potential resources of sustainable development for Romanian crop production and develop three scenarios to forecast the trend of crop production for 10 years.

2 METHODOLOGY

The scenario methodology was used to develop the study. Projecting scenarios focused on the long-term sustainability of agriculture. The chosen method of transfer scenario was based on a detail analysis of the core issue trends of the existing situation and than transferred into a new situation that depicted their progress from the starting situation to the future state. The method used in projecting scenarios was iterative, as insights gained during one scenario were used to develop the next. When developing the hypothesis a step-by-step method was used, which gradually optimized the goals initiated in the first scenario within the next scenarios.

The paper introduces three different scenarios for Romanian crop production, all of which are based on the relation between the actual Romanian agro-food consumption model and the available natural resources under the existing farm structures of production and management. It is generally agreed that in the system of population needs, agri-food needs assume first place. The quantity of food products needed by the population of a country represents one of the main factors that influence the elaboration of economic, agricultural and political strategies for further development. This is why, when projecting scenarios, it is important to identify the population's agri-food needs and the potential impact of the demographic trends on agri-food needs.

When developing scenarios, the following were analyzed over a 15-year period: The average consumption needs of the Romanian population, the trend of domestic availabilities for the main food products, demographic trends, the production structure of agricultural holdings and the trend of the main components of cereal supply balance sheets. To project the trend of crop production over 10 years, a number of hypotheses were assumed with regard to the evolution of several variables as major determinants of crop production.

In order to analyze yearly food consumption needs required to cover physiologic nutrition requirements, physiologic requirements were calculated starting from average daily food ratios for the main food groups, per person. Calculations were done for the entire population of the country over a 15 years period, for three possible consumption norms, according to:

- Yearly physiologic food needs, according to FAO/WHO recommendations;
- Yearly available resources for food consumption;
- Yearly physiologic needs adjusted with the coefficient of the average food behavior.

At forecasting the consumption model, the influence that the Common Agricultural Policy might have on consumers' behavior was considered.

To assess the potential of the natural agricultural resources for covering agri-food consumption needs, a diagnostic analysis comparing the existing situation in selected European Union countries was carried out. The main areas covered by the analysis were: Management structures of the agricultural holdings in the utilised agricultural area; distribution of the utilized agricultural area by main use categories; impact of the shifts in agricultural structures on crop production structures; structural changes in resource formation and production destination for main crops; foreign trade with cereals; trade orientation of the agricultural holdings; irrigation system; fertilisers; tractors endowment, etc.

To project the scenarios, the present situation was combined with future expectations starting from a set of realizable objectives and using them to develop alternative desirable future situations. By identifying the primary "driving forces", three anticipated scenarios were identified:

Scenario A – *Objective: To cover the population's minimum consumption needs with domestic production.*

This scenario, which is considered a minimum one, portrays a ten-year period. The scenario is founded on the assumption that accession to the European Union will represent for Romania a major start in modernising agricultural production, by spurring concentration, specialisation, intensification, extension of ecological agriculture, etc. When developing scenarios, the following were analyzed over a 15-year period: The average consumption needs of the Romanian population, the trend of domestic availabilities for the main food products, demographic trends, the production structure of agricultural holdings and the trend of the main components of cereal supply balance sheets By applying a particular hypothesis, the above-mentioned trends were transferred into a specific goal forecast over ten years, which envisioned ensuring the population consumption requirements, in quantitative and qualitative terms, close to those registered in developed countries. It was foreseen that, after accession, by expecting an increase in population incomes, the model of the population's food consumption will qualitatively improve. However, due to the population's mentality and conservative traditions, as well as to the significant share of self-consumption, this process might only slightly register in the agri-food consumption model. This is why, when developing the scenario, the agri-food consumption model is to be corrected with a specific average food behavior coefficient. In this scenario, a progressive reduction in imports is foreseen, and thus consumption needs to be covered from domestic production.

Scenario B – *Objective: To cover the population's consumption needs from domestic production and to provide surpluses for export.*

This scenario, which is considered a medium one, portrays a period of ten years, and transfers noteworthy assumptions specified in the first scenario and iterates part of the insights gained. The specific goal of this scenario is to ensure the populations' balanced consumption by increasing its caloric intake to one that is similar to those registered in developed countries. When developing this scenario, the agri-food consumption model will also be corrected with the specific average food behavior coefficient. In this scenario, a progressive increase in crop production to levels that will completely cover the population's consumption needs, and also provide important quantities for export, is foreseen.

Scenario C – *Objective: To ensure highe domestic nutrition requirements, both qualitatively and quantitatively, while also providing major quantities for export.*

This scenario, which is considered a maximum one, portrays a tenyear period. The scenario transfers noteworthy assumptions specified in the first scenarios and iterates part of the insights gained. The specific goal of this scenario is to ensure equitable consumption to an increased number of consumers, according to qualitative and quantitative criteria, by integrating the actual ecologic requirements. When developing the scenario, the agri-food consumption model will also be corrected with the specific average food behavior coefficient, but will also take into consideration the nutrition requirements for a larger number of consumers. In this scenario, a progressive increase in crop production to levels that will not only completely cover consumption needs, but also provide major quantities for export, is foreseen.

3 STUDY RESULTS

Under the present state of utilization, Romanian agricultural land resources do not constantly ensure the holistic coverage of the quantitative and qualitative domestic requirements for cereals consumption. The cereals market is often dependent on natural and/or economic risk factors that can lead to important deficits that bring distortions to cereal demand and supply on the domestic market. However, the deficits are not always real from the physical point of view, but only from the commercial perspective, because in favorable years the agricultural producers, and especially the family farms, due to the uncertainty of forthcoming crops, stockpile large quantities of cereals. On the other hand, cereal stocks are also determined by the fact that the unattractive prices do not stimulate marketing on formal cereal channels, which artificially creates a deficit even when excessive crops were obtained. This imposes a frequent demand for imports, often resulting in fluctuations in cereal balance sheets.

The undertaken analysis leads to the conclusion that Romania, according to the developments of the alternative scenarios presented in the paper, should be able to comply not only with the population's actual consumption needs from domestic resources, but also to ensure food supplies to a total number of consumers three times larger than that of the Romanian population.

REFERENCES

BULGARU, M. (2003): Mileniul III disperare şi speranţă, *Romanian Statistical Journal,* Publishing House.

CSAKI, C., KRAY, H. (2005): Romanian food and agriculture from a European perspective, *ECSSD Environmentally and Socially Sustainable Development Working Paper No. 39.*

MANOLELI, D. G. et al. (2004): Setting the development priorities for Romanian agriculture and rural sector. The impact of the new common agricultural policy reform, *Pre-accession Impact Studies II, Study No. 11,* The European Institute of Romania, Bilingual Publishing House, Bucharest.

POPESCU, M. (2001): Agricultura 1990-2000, Lessons of transition, The Expert Publishing House.

TURTOI, C., TOMA, C. (2006): Rural space multifunctional development and holdings orientation towards non-agricultural activities, Complex Development of Rural Area, ASE, preprint.

IMPACT OF FINANCING AND CAPITAL ACCESS IN UKRAINIAN AGRICULTURE

Nataliya Zinych

1 STUDY MOTIVATION AND OBJECTIVES

Investment is an important component of firms' structural change that is widely discussed in the economic literature. Capital demand in transition countries is particularly high, but the capital access needed for investment there can be characterized as rather difficult. Since equity capital is lacking, debt capital is a main source of financing. Capital markets, however, are underdeveloped in transition countries.

This study highlights the current status of financing and investment in the Ukrainian agricultural sector. During the past decade, the Ukrainian government's desire to ensure political control over agricultural production was noted in several studies which point out the weaknesses of newly-restructured farms and rural capital markets (SEDIK, 2003; STRIEWE et al., 2001).

Neo-institutional theory provides two opposite explanations of how investment and financing opportunities are related. The first is the credit-rationing theory (STIGLITZ and WEISS, 1981), which builds on information asymmetries in the lender-borrower relationship. Thus, the firms with potential external capital demand cannot borrow a desired credit amount despite their willingness to pay current interest rates. Empirical applications of credit rationing theory and capital market imperfections are reviewed by HUBBARD (1998) and PETRICK (2005).

Another theoretical approach is the concept of Soft Budget Constraints (KORNAI et al., 2003). The term 'SBC' became an important policy issue in transition economies, and refers, first and foremost, to state bail-outs of unprofitable enterprises though subsidies, credits, tax privileges, and other policy instruments. The SBC phenomenon in former socialist countries should be interpreted as being caused by particularly paternalistic objectives of economic and social stability after the beginning of transition.

Thus, this study addresses the following questions:

- What is the state of the art in explaining financing and investment during the 'stop-and-go' transition in Ukrainian agriculture?
- Are Ukrainian farms really financially-constrained, or is there evidence of Soft Budget Constraints?
- Which political measures aimed at the financial health of Ukrainian agriculture can be recommended?

Our hypothesis is that the SBC are prevalent in large Ukrainian farms which have inherited good relationships to the authorities and financial institutions.

2 METHODOLOGY

The presence of SBC is empirically analyzed in the large farm sector in 3 Ukrainian regions (Zhytomyr, Tcherkasy and Mykolayiv) with different environmental and economic conditions of agricultural production. For this purpose, descriptive and econometric analyses are used. The descriptive portion interprets financial indicators derived from balance sheets and income statements. In the SBC literature, it is often supposed that enterprises facing Soft Budget Constraints reveal less sensitivity of investment decisions to capital structure. Hence, we classify

the farms as operating under the SBC if they receive credits, even if they are loss-making or non-liquid. Because of a short data panel, we take into account both long-term and short-term debt.

In order to econometrically prove the SBC hypothesis, an Euler investment equation is derived from the first order conditions for the value of a profit-maximizing firm with respect to its capital and borrowing constraints (RIZOV, 2004). The structural Euler investment equation can be estimated after specifying a quadratic adjustment cost function for capital and under a corresponding assumption of expectation errors. The suggestion is that *a priori* financially-constrained farms indicate binding liquidity restrictions expressed by significant cash flow coefficient.

An empirical Euler equation is estimated for a sample of 695 farms between 2001 and 2004. For the first specification, a dummy variable is defined which allows the model parameters to differ across firms in two ways: Financially-unconstrained (perhaps having SBC) and constrained, respectively. The farms are classified as unconstrained if they borrow during at least two consecutive years. A second specification of the Euler equation provides stronger sample separation criteria: Non-negative profits of unconstrained farms.

Due to the dynamic nature of the Euler investment equation and the heterogeneity of the panel data, Generalised Method of Moments (GMM) is the best unbiased and efficient estimator. First differentiating eliminates the individual effects, and possible correlations between explanatory variables and the error term (ARELLANO and BOND, 1991). It should also be noticed that in case of insignificant individual effects, one could ignore them. Thus, the two-stage least squares estimator remains unbiased for the Euler investment equation.

3 STUDY RESULTS

In general, the rural credit market in Ukraine seems to be underdeveloped: Only 4 percent of observed farms received long-term credits in 2004. The number of profitable farms, as well as farms with positive investment rates, can be characterized as regionally-specific. The benchmark is the Mykolayiv region in the southern part of Ukraine, where 84 percent of the farms have a pre-tax profit and 56 percent have positive investments. The outsider remains the Zhytomyr region, with only 40 percent non-loss making farms and positive investment as well.

For at least a part of the observed enterprises, the hypothesis about a weak financial hierarchy can be confirmed. There are some regional peculiarities in distribution of the SBC-farms: From 15 percent in both Tcherkasy and Mykolayiv, up to 27 percent in the Zhytomyr region. This is due to the fact that large farms in the Zhytomyr region operate under more difficult natural conditions. Hence, the local authorities and banks more intensively support the unsuccessful enterprises.

Cash flow parameters in estimated Euler investment equations (2SLS) have the expected signs. In both specifications, a significant relationship between investment and financial variables is noticed for financially constrained sub-samples. For *a priori* unconstrained (SBC) large farms, the Euler investment cannot be rejected. The latter could otherwise confirm the existence of perfect capital markets in Ukraine, but as mentioned above, they are rather underdeveloped. The phenomenon of Soft Budget Constraints in Ukrainian agriculture requires further research.

REFERENCES

ARELLANO, M., BOND, S. (1991): Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, *Review of Economic Studies, 5*, pp. 277-297.

HUBBARD, R. G. (1998): Capital-market imperfections and investment, *Journal of Economic Literature, 36*, pp. 193-225.

KORNAI, J., MASKIN, E., ROLAND, G. (2003): Understanding the soft budget constraint, *Journal of Economic Literature, 41 (4)*, pp. 1095-1136.

PETRICK, M. (2005): Empirical measurement of credit rationing in agriculture: A methodological survey, *Agricultural Economics, 33*, pp. 191-203.

RIZOV, M. (2004): Firm investment in transition: Evidence from Romanian manufacturing, *Economics of Transition, 12 (4)*, pp. 721-746.

SEDIK, D. (2003): Rural finance without markets in Ukraine, 1991-2000, *ESA Working Paper 03-01*, Food and Agriculture Organization, <http://www.fao.org/es/esa>.

STIGLITZ, J. E., WEISS, A. (1981): Credit rationing in markets with imperfect information, *American Economic Review, 71*, pp. 393-410.

STRIEWE, L., CHAPKO, I., STARIKOV, A. (2001): Rural finance in Ukraine – Extending the frontier, in: VON CRAMON-TAUBADEL, S., ZORYA, S., STRIEWE, L. (eds.): Policies and Agricultural Development in Ukraine, Aachen, Shaker Verlag, pp. 53-70.

AUTHORS' INDEX

ALBOIU, CORNELIA: Institute of Agricultural Economics, Romanian Academy, Bucharest, Romania (coraalboiu@yahoo.com);

BOKUSHEVA, RAUSHAN: Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), Germany (bokusheva@iamo.de);

BOROVICKA, JAROSLAV: Center for Economic Research and Graduate Education (CERGE-EI), Prague, Czech Republik (Jaroslav.Borovicka@cerge-ei.cz);

BUCHENRIEDER, GERTRUD: Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), Germany (buchenrieder@iamo.de);

CIMPOIEŞ, DRAGOŞ: Faculty of Economics, State Agricultural University of Moldova, Chişinău, Moldova (dcimpoies@uasm.md);

GRAUBNER, MARTEN: Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), Germany (graubner@iamo.de);

KASARJYAN, MILADA: Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), Germany (kasarjyan@iamo.de);

MRAZ, MARIAN: Institute of International Integration Studies (IIIS), Trinity College Dublin, Ireland (mrazm@tcd.ie);

POGHOSYAN, TIGRAN: Center for Economic Research and Graduate Education (CERGE-EI), Prague, Czech Republik (Tigran.Poghosyan@cerge-ei.cz);

PREIDL, MARCIN: Department of Agricultural Economics and Social Sciences, Humboldt-Universität zu Berlin, Germany (m_preidl@interia.pl);

RAU, MARIE-LUISE: Department of Agricultural Economics and Social Sciences, Humboldt-Universität zu Berlin, Germany (raumarie@rz.hu-berlin.de);

RIZOV, MARIAN: Middlesex University Business School, UK (M.Rizov@mdx.ac.uk);

SCHNICKE, HAUKE: Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), Germany (schnicke@iamo.de);

TUDOR, MONIKA MIHAELA: Institute of Agricultural Economics, Romanian Academy, Bucharest, Romania (monik_sena@yahoo.com);

TURTOI, CRINA-SÎNZIANA: Institute of Agricultural Economics, Romanian Academy, Bucharest, Romania (cturtoi@yahoo.com);

ZINYCH, NATALIYA: Department of Agricultural Economics and Social Sciences, Humboldt-Universität zu Berlin, Germany (nataliya.zinych@agrar.hu-berlin.de) and Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale) (zinych@iamo.de);

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