

PERFORMANCE OF LARGE-SCALE RUSSIAN FARMS AND FINANCIAL ENVIRONMENT: METHODOLOGICAL APPROACH

IRINA BEZLEPKINA

1 BACKGROUND

The agricultural sector and its developments in transition economies have drawn attention of international economists. A dramatic decline of farm performance and its causes became one of the most popular topics in the corresponding stream of economic literature. Several econometric studies on Russian agriculture address the question of impact of financial determinants on farm performance. In those studies, aggregated oblast data on Russian regions or individual farm data within one region are used (see e.g. ARNADE and GOPINATH, 2000; EPSTEIN, 2001; OSBORNE and TRUEBLOOD, 2001; SCHULZE et al., 2001). The time path of one decade allowed gathering sufficient farm level data. Thus the econometric analysis can be expanded and performed at the micro level.

To understand the motivation of the study, it is helpful to briefly review some of the policy changes in Russian agriculture and also to give a general description on input and output adjustments and the development of productivity in agriculture. Ten years of transition from the socialist system to a market economy have brought an invaluable experience to the whole Russian economy and to its sectors, including agriculture. Transition to a market system in agriculture required the emergence of the new production units, since agricultural producers of the Soviet era demonstrated their inability to operate in a market economy. Large collective (*kolkhozes*) and state (*sovkhozes*) farms passed through the reorganization and restructuring campaign initiated in 1991-1992. Following enactment of the relevant legislation, state and collective farms have been transformed into a wide variety of farm organisations, such as producer co-operatives, joint stock companies, limited liability companies, partnerships, and individual farms. The land of collective and state farms was distributed equally per capita among collective farm members or state farm employees in the form of paper shares or certificates. The most radical form of farm restructuring was the break-up of collective or state farms into individual farms (see also SVETLOV, 2000). By the year

1995, almost all former kolkhozes and sovkhoses in Russia were re-registered. Recent surveys in the Ukraine and Russia showed that about a half of the farm employees reports that no real change has taken place so far in 'reorganised' farms (MACOURS and SWINNEN, 2000). The only real change to be observed is the abolition of imposed production plans. Similar findings that the reform did not really change the internal management, their actual organization, and work incentives are also reported in (LERMAN, 1998; LIEFERT and SWINNEN, 2002). Russia is assigned a score of 5.6 on a 10-point scale for the level of the economic policy reform that indicates its incompleteness (see CSABA and FOCK, 2000).

In parallel with large-scale farms restructuring, the Russian agriculture turned to organise family farms that immediately resulted in an increasing number of family farms from 4400 in 1991 to 270000 in 1994. It can be observed that family farming did not overtake the large-scale farming as it was expected. The share of private family farms in total agricultural production by year 2001 does not exceed 3 %, about 6 % of agricultural land is involved in their operation. Recent developments in the sector demonstrate the new trend of emerging the vertically integrated agro-food companies (RYLKO, 2001). These companies originate from other sectors of economy and invest in agricultural production. The extensive reviews of the previously existing and new farming structures in Russia can be found in SEROVA (2002).

The agricultural enterprises, being the main agricultural producers in the Soviet time, still remain the dominant group, producing 94 % of cereals, 96 % of sugar beet, 88.5 % of sunflower and 69.8 % of eggs on average in 1995-2000. Their contribution to the gross agricultural output (GAO) declined from 50.2 % in 1995 to 43.1 % in 2000 (GOSKOMSTAT, 2001). However, in institutional sense these producers are still dominant in Russian agriculture (LIEFERT and OSBORNE, 2002). The performance of the agricultural sector is and most likely will be determined by the performance of these producers. Remarkably, the most successful producers that form the Club "Agro-300" are the large producers that account for only 1.1 % of the population of agricultural enterprises and contribute about 16.1 % to the GAO, on average in 1997-1999 (NIKITIN, 2002).

The main feature of the first decade of transition has been a substantial drop in agricultural production, especially in the livestock sector. Productivity decline is evident from a casual glance at partial productivity measures, such as the total value of output per unit of land or labor (OSBORNE and TRUEBLOOD, 2002; SVETLOV, 2002b). After an initial dip in agricultural production, Russian agriculture was expected to recover significantly. However, GAO has declined by over 40% between 1991-1998¹, and more than half of the enterprises were un-

¹ This figure is given for all types of producers. Gross agricultural output by agricultural

profitable after year 1993 (GOSKOMSTAT, 2001; p. 547). In 1997, the sector demonstrated a small economic growth of 1.7 %. After the financial crisis of 1998, the sector started to recover and obtained an annual growth of 5 % on average in 1999-2001 and the number of loss making farms declined to 50,7 % in 2000². A stabilization of the sector in 1999-2001 allows the economists to forecast its growth in the future considering a 3-4 % annual GDP growth (LIEFERT and OSBORNE, 2002).

This paper further reviews the financial situation in agricultural sector such as farm insolvency and soft budget constraint phenomenon, subsidizing and credit policies. Next, a set of empirical research questions is formulated that address the issue of financial determinants impact on farm performance. Corresponding with research questions, the methodological considerations are presented. The big issue in microeconomic modelling arises when the data from transition economy are used. Therefore, attention is paid in justifying the methodological approach and in underlying the valid assumptions. The paper concludes with a discussion on the possible impact of financial variables on performance and some methodological issues.

2 FINANCIAL ENVIRONMENT AS A FACTOR OF FARM PERFORMANCE

2.1 Prices and subsidies in agriculture

Following price liberalization in 1992, all relative prices started to approach world levels. Price liberalization has resulted in a so-called price disparity between industrial and agricultural sector. At the end of 1992, the gap or price disparity became extremely large: prices of farm output went up 9.4 times and prices of industrial output increased by 33.8 times (GOSKOMSTAT, 2001). The declining terms of trade, especially in the beginning of reform, is named as one of the major reasons of the current unfavorable situation in agricultural sector (STROKOV et al., 2000; VARSHAVSKY, 2000). In the period 1995-2000, the gap between prices reduced.

In the centralized Russian economy, subsidies were the key element of price policy as they compensated for the difference between administered prices and actual

enterprises reduced even more dramatically: 1991-1998 by 60 %. Given the tendency to overreport production during the Soviet era, the actual output drop may have been somewhat smaller (OSBORNE and TRUEBLOOD, 2002).

² Producers tend to reduce declared profits, thus the number of loss-making farms could be somewhat smaller (see e.g. YASTREBOVA, 2001). On the other hand, the threat of bankruptcy would counterbalance the incentives to exaggerate losses, thus the number of loss-making farms is probably accurate (OSBORNE and TRUEBLOOD, 2002).

costs of products. Historically, agricultural producers were granted output subsidies and compensations for input costs. Input subsidies (compensations) were paid directly to producers for a range of agricultural inputs as for instance fertilizers and chemicals. Output subsidies are price-premiums. Both output and input subsidies are granted to the farm *a posteriori* and depend on actual production and costs. In practice, subsidies are received with a few months delay (SEROVA et al., 2001). In 1992, the government introduced direct subsidies for livestock products. Since then, livestock sector absorbs a large fraction of total budgetary transfers while still remaining the major loss-making sector in agriculture. In the Moscow Region about 82 % of gross subsidies were granted for livestock production in 1997-1998 (see MINSELKHOZPROD, 2000).

Since 1998-1999, the subsidising policy has shifted to the regional level. By the year 2000, two thirds of the domestic support was financed by the regional ministries of agriculture, which tend to implement different (incoherent) agricultural support policies (NIKITIN, 2002). Regional and federal budgets finance similar state support programs. Double support programs, especially when one of either programs is not stimulating any incentives by setting lower subsidy rates, are inefficient (SEROVA et al., 2002).

Compared to the pre-reform situation, the farms are not heavily subsidized any more. For example, in Moscow Region the subsidies e.g. for milk in 1996-1999 remained at the level 100 Roubles per 1000 kg, whereas the milk prices increased by 3 times in the same period. Having the declining trends in both output and subsidies, the share of subsidies in the regional agricultural output remains about 12.5 % in 1997-1998 (see MINSELKHOZPROD, 2000). According to LEGEIDA (2001), in transition economies the direct (explicit) support transmits into indirect (implicit) support such as reduction of taxes, subsidized credit rates, forgiveness and restructuring of debts, etc. In the Moscow Region, for example, part of the debts of input suppliers to the regional budget is transferred into the subsidy to agricultural producers by supplying the machinery and equipment to them (PARSHINCEV, 2000).

By contrast with indirect state support, direct price subsidies and costs compensations are expected to be transparent and reflected in the budget documents. The national statistical yearbooks hardly provide any regional or national data on the level of subsidies or subsidy rates differentiated by outputs and inputs. SEROVA et al. (2001) admit that data on budgetary transfers from different statistical sources are conflicting and that the budget expenditures for the agro-food sector are not transparent. This complicates the analysis of subsidy policies.

Subsidies and compensations differ among the regions. Some regions set higher subsidy rates for products sold within than outside the region, thus introducing implicit trade barriers (SEROVA et al., 2002). Within a region the subsidy rates may differ by the level of e.g. livestock productivity, type of climate zone, sea-

son of a year, type of the final consumer such as the state or baby-food producers, etc. (BORKHUNOV and NAZARENKO, 2000). The subsidy policy in the Moscow region applies the same subsidy rates to all producers irrespective of productivity and location.

2.2 Farm business insolvency

Indebtedness of the enterprises has been a problem from the beginning of reforms of the Russian economy. This problem was particularly severe in the farming sector (YANBYKH and YASTREBOVA, 2002). Payments due among and within the sectors of the economy continue tightening the activities of producers in many sectors of economy. Agricultural enterprises also accumulated high debts. The level of debt payables both long- and short-term in constant prices increased throughout 1995-2000 by 1.5 times. In 2000, about 80 % of Russian farms had overdue debts (by longer than 3 months for short-term and by longer than a year for long-term).

UZUN (2001) defines five groups of farms in according their solvency. By such classification, the first group of financially sound farms (22 % in 1999-2000) produces 51.5 % of total marketable output. By comparison, the worst performing group includes 27 % of farms and contributes 6.4 % to the revenue and has a level of outstanding debts that is four times larger than that of the first group. A clear observation is that farms do differ a lot in terms of their level of financial performance. Several factors may contribute to it.

One of the concomitant features of farm insolvency is the phenomenon of soft budgetary constraint (SBC) that is routine loan forgiveness. This phenomenon provides an explanation for the weak incentive to improve performance. The theory of SBC also predicts that poorly performing farms will have a high percentage of revenue from subsidies (OSBORNE and TRUEBLOOD, 2002). As follows from the study of SCHAFFER (1998), the state in transition countries tends to soften the liquidity constraints mostly by means of allowing the enterprises to generate tax arrears that is a part of total debt payables.

The major creditors of agricultural enterprises in Russia are suppliers and the state (budget and non-budgetary funds). At the end of 2000 the share of debts on loans to the banks and other creditors is about 16 % of total debt payables (GOSKOMSTAT, 2001, p. 559). The largest component of debt receivables in 1996-2000 on dairy farms in the Moscow Region is a debt to suppliers (53 %), tax arrears with debts to social insurance funds constitute 29 %, wage arrears – 12 %.

2.3 Agricultural credit

From the very beginning of the economic reforms in Russia, the agricultural sector has been faced with a lack of credit resources. It was a natural consequence of credit market liberalization: like any other resource, credit has flown away to

the most profitable economies. Since then, the government introduced new methods of credit granting in agriculture, so called *direct credit*. The main purpose of this system was to provide the agricultural sector with seasonal credit to replenish its working capital and thus to replace the old 'planned' system during the transition period. However, the provision of directed credit both in monetary (1992-1994) and commodity (1995-1996) forms has marked the beginning of the deterioration of farm solvency, periodic debt restructuring and debt write-offs (YANBYKH and YASTREBOVA, 2002).

Credit market for agricultural producers still has to be developed. Commercial banks do not supply loans to agricultural enterprises because of their insolvency. The regional administrations grant credits to indebted farms a) to give the farms a chance to improve their financial performance; b) to use the regional quota for credit resources available from the Special Credit Fund established in 1997 (YANBYKH and YASTREBOVA, 2002). The role of credit is slowly becoming more important: its level increased by 2.4 times and its share in cash receipts increased from 3 % in 1995 to 11 % in 2000. Poor financial discipline of farms still results in accumulating overdue debts to banks. However, its declining trend in 1998-2000 may indicate an improvement of farm performance.

3 THEORETICAL FRAMEWORK

From the agricultural policy view it is important to investigate how subsidizing policy, soft budget constraints, credit supply contribute to the performance of agricultural enterprises. To generate valid policy recommendations, it is necessary to study through which mechanism these policies influence farm decisions on input-output allocation and furthermore, the farm performance. Depending on the definition of farm performance, the research may result in analysis of the impact of subsidy, credit and debts on technical change, profitability, technical efficiency, allocative efficiency and overall economic efficiency.

In the analysis of the data from transition economies the neo-classical economic framework was both criticized and applied. It is argued in the study of SEROVA and KHRAMOVA (2001) that producers in a collapsing agriculture in transition have a specific objective function following from their behavior aiming at survival: farms tend to preserve their assets and personnel despite the opposite requirements of profit-maximizing behavior. SVETLOV (2002a) models the utility function of large-scale farms and concludes that it is determined by the level of depreciation, wages and the cost for maintaining the social facilities. The exact nature of the objective of agricultural enterprises has not been well defined yet.

Neo-classical economic theory has been widely applied in agriculture and thus generated a tremendous stock of knowledge. This research starts from adjusting the neo-classical firm model to conditions of transition economy. Reflecting dif-

ferent definitions of farm performance and aiming at answering the research questions, several approaches are developed.

Addressing the question of the relation between input-output allocation, financial constraints and performance, the *profit function framework* can be applied. Under a lack of finance, gross subsidies may serve as a source of liquidity thus allowing for the assumption that producers are maximizing the overall short-term profit plus gross subsidies. The gross subsidies may have a pure wealth effect without altering the input-output decisions or, if they are coupled to levels of inputs and outputs, they may influence the net returns obtained by the farms, e.g. play a similar role as prices and thus have a reallocation effect. Thus, the effect of subsidies may be studied in two alternative ways: introducing them as fixed inputs into the profit function or introducing them as price correctors. Given the fact that price effects are not well studied at the Russian farms, utilising the profit function approach fills this gap. This approach also allows for deriving shadow prices of fixed inputs, which provide information about their scarcity.

To combine economic and technological dimensions in defining the farm performance, the *efficiency analysis* is considered to be fruitful. Farm production involves both input and output. In an input oriented model the objective is to produce the observed outputs with as little inputs as possible. In an output-oriented model the objective is to maximize the level of output from the observed amount of inputs or resources. An output-oriented approach seems reasonable for modeling the Russian agricultural production, which is characterized by limited inputs because of a lack of finance for nearly each individual farm. FARE et al. (1994) refer to the following definition of output-oriented efficiency measures. Technical efficiency refers to the ability of a firm to obtain maximal output from a given set of inputs. Allocative efficiency reflects the ability of a firm to obtain maximal revenue producing the outputs in optimal proportions, given their respective prices and production technology. The product of technical and allocative efficiency measures gives the overall economic efficiency (see FARE et al., 1994 for more details). To analyse the impact of subsidies on efficiency, it is possible to derive the allocative efficiency measure when prices are adjusted and not adjusted for the subsidies. The comparison of these measures would give the effect of subsidies. The efficiency measures computed in this way would reflect the ability of farms in obtaining revenues from the market and revenues from the state budget (subsidies).

The *production function framework* has been widely applied in analysing the relations between the production factors and outputs, thus quantifying the effects of inputs on either production or productivity. Recent literature uses this framework in studying the effect of e.g. (a) ownership, competition and privatization on industrial firm's productivity in Russia (BROWN and EARLE, 2000; 2001) and in Ukraine (SCHNYTZER and ANDREYEVA, 2002). In these studies, so-called

shifters are introduced as dummy variables or in the form of indices or ratios. The level of subsidies (or credits, debts) may also be treated as a production function factor. The rationale for incorporating e.g. financial factors in the production function is they affect the productivity of regular inputs, and as such they affect total factor productivity. The outcome of such analysis would be the quantification of the impact of both production factors (as usually referred in the literature: land, capital, labor and variable inputs) and financial factors (for example, the level of subsidy).

4 THE DATA SOURCE

Farm level data as the main source of data are required in addressing the proposed research questions. The data problems appearing when studying the transition economies are mentioned in many studies. The first problem is the data availability. Particularly at the beginning of transition, the official statistical information was weak and not very reliable. The way out is to either take data available and see how far one can get, or collect data by means of surveys and case studies (HANISCH et al., 2002).

Different data sets of Russian farms, complementing each other, are available for the period 1995-2000. The main data source are the agricultural registries from the Goskomstat (State Committee for Statistics) that contain annual records on all Russian medium and large agricultural enterprises (about 27000 annually). These data are based on the reports, which are submitted to local statistical offices and correspond with other forms submitted to tax offices and thus are the only official sources of farm accounting system available. The registry has a rather broad range of technological variables (land area by varieties of crops, heads of animals, crop and livestock output by types in physical and Rouble values, inputs by categories in Rouble value, etc.) but lacks the variables on farm financial aspects such as credits, debts. As an advantage, the data set includes detailed data on input and output subsidies.

The data from a subset of farms located in the Moscow region are supplemented with financial reports such as balance sheet, income and capital statements, etc. (forms 1-5 in Russian accounting). Livestock sector takes a leading role in agricultural production of large-scale farms in the region. About 140 farms (almost one third of regional number of farms) specialize in milk production with its share in gross revenue larger than 60 %.

5 TOOLS FOR THE EMPIRICAL ANALYSIS

When a large number of observations is available, powerful statistical and non-statistical methods can be used. The regression analysis and the Data Envelopment Analysis (DEA) are useful tools for analyzing the data in line with the presented theoretical frameworks.

The *parametric* regression analysis can be utilized for any of the mentioned approaches. The availability of panel data can be explicitly taken into account, by assuming that each farm has a farm-specific intercept in the profit or production function. Thus, the fixed-effect model can be estimated. The farm-specific intercepts reflect variation in farm-specific characteristics such as soil, climate, managerial and farm worker capabilities. The reverse causality problem between financial measures on the right hand side and profit or output on the left hand side, in other words the problem that subsidies may more likely go to worse farms or that high debts may be generated by low performing firms, can be handled by applying an instrumental variable technique. The instrumental variables that would explain the variance in financial variables and are uncorrelated with the dependent variable should be constructed. Several groups of instruments are proposed. Following BROWN and EARLE (2000), the first group consists of instruments computed as the average value over all the other farms in the region. The second group of instrumental variables for financial factors consists of their lagged values. The third instrument for subsidies is the share of actually paid gross subsidies to its projected level in the federal budget.

The efficiency of production, in addition, can be defined with the DEA, which is a *non-parametric* method. There is an ongoing discussion in the literature about the choice of Stochastic Frontier Analysis (SFA), which is parametric, and DEA in empirical implications. Most likely farms face common regional prices, so a lack of price variation would result in difficult econometric estimation while applying the SFA. The DEA is sensitive to variable selection and data errors. Given the condition of data clearance and careful constructing of variables, the DEA seems to be a useful approach. Next, the DEA allows incorporating constraints on debts or credits rather straightforward, thus in addition to the impact of subsidies, the impact of debts or credits on efficiency measures can be studied. As an advantage of DEA, this approach does not require the specification of the functional form for stochastic frontier that is a necessary requirement for SFA.

6 DISCUSSION

This paper aims at formulating research questions based on descriptive national statistics and recent literature. Neo-classical models are found to be useful in in-

investigating effects of institutional change on resource allocation (HANISCH et al., 2002). The neo-classical theory forms the theoretical framework for analysing the effect of financial determinants on input-output allocation and performance. Performance indicators are technical, allocative and economic efficiency as well as profitability and productivity. It is also important to account for the relatively new discipline of New Institutional Economics as it may contribute to the interpretation of results from neoclassical models (HANISCH et al., 2002).

This paper proposes to investigate the impact of the following financial variables: subsidies, short-term credits and debts. The impact of subsidies on resource allocation and performance may be positive and negative. At the micro level, subsidies can create impediments to competition through unequal conditions for functioning of the farms. Furthermore, they can lead to ineffective distribution of resources, give wrong market signals and perpetuate loss-making enterprises (LEGEIDA, 2001). Analysis of the state subsidizing policy in Russia presented in SEROVA et al. (2001) shows that subsidy transfers are mostly inefficient in Russian agriculture because they are aimed at covering the deficit of working capital. Instead they might be used to assist in promoting the institutions for agrarian developments. Compensations for fodder to livestock and poultry producing farms prolong their inefficient business and stimulate unfair competition. Compensations of expenses for grain and oil seeds are questionable as these activities are profitable. Serving as extra source of finance for the farms that operate under severe lack of liquidity, subsidy may positively influence performance.

High debt payables may lead to deteriorating farm performance and to the bankruptcy. On the other hand, short-term debts may keep farms in business when debts are used as a source of working capital (see also YASTREBOVA, 2001) under given conditions that neither the state nor suppliers harden the budget constraints.

In developed economies, short-term credit would positively affect the production and the performance of farms suffering from a lack of financial resources. In transition economies, under conditions of underdeveloped credit markets and prevailing farm insolvency, credit may not relieve the financial constraint, as farms may not experience a lack of credit.

The research can be performed with panel data from a large number of Russian farms. The advantage of the large sample on all large-scale farms in Russia is that results can be generalized for Russian agriculture. A smaller sample of dairy farms from the Moscow Region is not fully representative for the whole Russia, thus the limitation is that *results* of the analysis can be generalized for farms in other regions of Russia with some caution. Nevertheless, the micro econometric *models* can be immediately applied to other large-scale farms in the Moscow Region and other regions of Russia. Other advantages of using a smaller sample of specialized farms are that a) the sample is homogeneous as it is required for microeconomic

modelling; b) it has a larger list of financial variables and some of the missing values can be recovered.

The choice upon the functional form is important to make when modelling profit or production function. Literature on micro econometric modelling suggests the use of flexible functional forms since they do not impose arbitrary restrictions on the underlying technology. Commonly used flexible functional forms are Translog, the Symmetric Normalised Quadratic (SNQ) and Normalised Quadratic (NQ) (see OUDE LANSINK and THIJSEN, 1998). SNQ and NQ allow for both positive and negative values on the left-hand side. In addition, these functions allow for imposing convexity in prices globally and thus can be recommended for profit function models. However, the NQ functional form has a serious disadvantage compared to the SNQ, i.e. the estimates of the NQ depend on the choice of the *numeraire* (see BOOTS, 1999; DIEWERT and WALES, 1987 for details). The translog functional form is less complicated in modelling. It has been widely used in agricultural production analysis and can be considered for production function modelling.

ACKNOWLEDGEMENTS

This paper has benefited from the comments and suggestions of ALFONS OUDE LANSINK and NIKOLAI SVETLOV. The financial support from the research grant R01-0341 of the Economic Education Research Consortium is acknowledged.

ABSTRACT

Large-scale farms in transitional Russia demonstrate a declining performance that is reflected in a large number of unprofitable farms, falling output and lower productivity. These farms remain the main producers of cereals, sunflower, sugar beet, eggs and accumulate about 82 % of total agricultural land in Russia. Being the major players in agricultural sector, their performance and in particular their decision-making are of high interest for policy makers. This paper reviews the developments in agricultural sector focusing on financial policies such as subsidies, credit and soft budget constraints. Reviewing the policy outcomes, a set of empirical research questions addressing the issue of financial determinants impact on farm performance is formulated. Corresponding with research questions, the methodological considerations are presented. Regression analysis and Data Envelopment Analysis are discussed as tools for empirical research. The paper concludes with a discussion on the possible impact of financial variables on performance and some methodological issues.

РЕЗЮМЕ

*Производство продукции крупными российскими
сельскохозяйственными предприятиями и их финансовая среда:
Методологический подход*

ИРИНА БЕЗЛЕПКИНА

Производство продукции крупных сельскохозяйственных предприятий в России переходного периода отличается тенденцией к снижению, что подтверждается большим количеством убыточных хозяйств, уменьшением объемов производства и падением показателей производительности. В то же время эти хозяйства продолжают оставаться основными производителями зерновых, подсолнечника, сахарной свеклы и яиц, а также обрабатывают порядка 82 % общих сельскохозяйственных площадей в России. Поскольку они являются важнейшими игроками в сельскохозяйственном секторе, их производительность и, в особенности, их воздействие на принятие решений представляет значительный интерес для влиятельных политиков. В этом докладе освещается развитие в сельскохозяйственном секторе с фокусированием внимания на финансовой политике, включая субсидии, кредиты и мягкие бюджетные ограничения. Помимо обзора результатов политических действий в нем сформулирован ряд вопросов эмпирических исследований, которые касаются влияния основных финансовых факторов на деятельность сельскохозяйственных предприятий. В связи с исследуемыми вопросами приведены некоторые методологические соображения. В качестве инструментов эмпирических исследований рассмотрены регрессионный анализ и анализ оболочки данных. Доклад заканчивается рассмотрением возможного влияния финансовых переменных на характеристики деятельности сельскохозяйственных предприятий и некоторых методологических вопросов.

REFERENCES

- ARNADE, C., GOPINATH, M. (2000): Financial constraints and output targets in Russian agricultural production, *Journal of International Development*, 12, pp. 71-84.
- BOOTS, M. (1999): Micro-economic analysis of alternative policies for Dutch dairy farming, PhD dissertation, Wageningen University, Wageningen/The Netherlands.
- BORKHUNOV, N., NAZARENKO, A. (2000): Povyščenie effektivnosti dotatcii – Opyt 1999 goda [Subsidy efficiency improvement: Experience of year 1999, in Russian], *Ekonomika sel'skogo chozjaistva Rossii*, 5, p. 13.

- BROWN, J. D., EARLE, J. S. (2000): Competition and firm performance: Lessons from Russia, *Working paper 154*, Stockholm Institute of Transition Economics, Stockholm/Sweden.
- BROWN, J. D., EARLE, J. S. (2001): Privatization, competition, and reform strategies: Theory and evidence from Russian enterprise panel data, *Working paper 159*, Stockholm Institute of Transition Economics, Stockholm/Sweden.
- CSABA, C., FOCK, A. (2000): The agrarian economies of Central-Eastern Europe and the Commonwealth of Independent States: An update on status and progress, *ECSSD Working Paper 24*, The World Bank, Washington DC/USA.
- DI EWERT, W. E., WALES, T. J. (1987): Flexible functional forms and global curvature conditions, *Econometrica*, (55), pp. 43-68.
- EPSTEIN, D. B. (2001): Različija v finansovo-ekonomičeskom sostojaniji sel'chozpredprijatij [Differences in financial and economic performance of large-scale farms, in Russian], *Meždunarodnyj sel'skochozjaistvennyj žurnal [International agricultural journal]*, (3).
- FARE, R., GROSSKOPF, S., LOVELL, C. A. K. (1994): *Production Frontiers*, Cambridge University Press, Cambridge/UK.
- GOSKOMSTAT (2001): Rossijskij statističeskij ežegodnik [Russian statistical year book], Moscow/Russia.
- HANISCH, M., BECKMANN, V., BOGER, S., BREM, M. (2002): In search of the market: Lessons from analyzing agricultural transition in Central and Eastern Europe, Xth EAAE Congress, 28-31 August 2002, Zaragoza/Spain.
- LEGEIDA, N. (2001): Implicit subsidies in Ukraine: Estimation, developments and policy implications, *Working Paper 10*, Institute for Economic Research and Policy Consulting, Kiev/Ukraine.
- LERMAN, Z. (1998): Does land reform matter? Some experiences from the former Soviet Union, *European Review of Agricultural Economics*, 25 (3).
- LIEFERT, W., OSBORNE, S. (2002): Russian grain and meat production and trade: Forecasts to 2012, Successes and failures of transition – The Russian agriculture between fall and resurrection, IAMO, Halle (Saale)/Germany, 22-24 September 2002.
- LIEFERT, W., SWINNEN, J. (2002): Changes in agricultural markets in transition economies, *Agricultural Economic Report*, 806, Economic Research Service, USDA, Washington/USA.
- MACOURS, K., SWINNEN, J. (2000): Impact of initial conditions and reform policies on agricultural performance in Central and Eastern Europe, the former Soviet Union, and East Asia, *American Journal of Agricultural Economics*, 82, pp. 1149-1158.
- MINSKELKHOZPROD (2000): Ekonomičeskoe regulirovanie sel'skochozjaistvennogo proizvodstva v Moskovskoj oblasti [Economic regulation of agricultural production in the Moscow Region, in Russian], KULESHOV, N. I. (ed.), Moscow/Russia.
- NIKITIN, A. V. (2002): Development of agricultural enterprises in 1990-2000, 13th International Farm Management Association (IFMA): Congress, Wageningen/The Netherlands, 7-12 July 2002.
- OSBORNE, S., TRUEBLOOD, M. (2002): Agricultural productivity and efficiency in Russia and Ukraine: Building on a decade of reform, *Agricultural Economic Report*, 813, Economic Research Service, USDA, Washington/USA.

- OSBORNE, S., TRUEBLOOD, M. (2001): An efficiency of Russian crop output in the reform period, AAEA conference, Chicago/USA, 8-11 August 2001.
- OUDE LANSINK, A., THIJSSSEN, G. J. (1998): Testing among functional forms; An extension of the Generalised Bo-Cox formulation, *Applied economics* (30), pp. 1001-1010.
- PARŠINTCEV, G. A. (2000): Economic regulation of agricultural production under market conditions [Ekonomičeskoe regulirovanie razvitiya sel'skochozjaistvennogo proizvodstva v uslovijach rynka, in Russian], PhD Dissertation, Moscow Timiryazev Agricultural Academy, Moscow/Russia.
- RYLKO, D. (2001): Novye sel'skochozjaistvennye operatory, rynek sredstv proizvodstva i vertikal'naja koordinacija [New operators in agriculture, market of inputs and vertical integration, in Russian], USAID BASIS Conference, Golitsyno, IET, 6-7 July 2001.
- SCHAFFER, M. E. (1998): Do firms in transition economies have soft budget constraints? A reconsideration of concepts and evidence, *Journal of Comparative Economics*, (26), pp. 80-103.
- SCIHNYTZER, A., ANDREYEVA, T. (2002): Company performance in Ukraine: Is this a market economy?, *Economic Systems*, 26 (2), pp. 83-98.
- SCHULZE, E., TILLACK, P., FROHBERG, K. (2001): Factors determining profitability of large-scale farms in the Volgograd region, *Quarterly Journal of International Agriculture*, 40 (1), pp. 67-96.
- SEROVA, E. (2002): Evolution of the farm structure in Russia's agriculture: Background and perspectives, Pre-accession Strategy of Czech Agriculture towards EU, Prague/Czech Republic, 27-28 September 2002.
- SEROVA, E., KHRAMOVA, I. (2001): Market transactions in Russia's agriculture, transition, rural development and the rural sector, CESTRAD, ISS, The Hague/The Netherlands, 10-11 December 2001.
- SEROVA, E., KHRAMOVA, I., KARLOVA, N., TICHONOVA, T., SHICK, O. (2002): Regional'naja podderžka APK [Regional support to the Agro-Food sector, in Russian], *Agro-Food Centre Bulletin*, 13 (3), pp. 32-40.
- SEROVA, E., KHRAMOVA, I., MELUCHINA, O., TARASOV, A., KARLOVA, N., TICHONOVA, T., PISMENNAJA, O. (2001): Povyšenie éffektivnosti ispol'zovaniya budžetnyh sredstv v APK Rossii [Budget support of the Russian agrifood sector: Improving the efficiency, in Russian], *Agro-Food Centre Bulletin*, 7 (1), pp. 2-29.
- STROKOV, S. N., KOR BUT, A. V., SARA IKIN, V. I. (2000): Formirovanie zadolžennosti sel'skochozjaistvennyh predpriyatii v 90-ch gg [Short-term debt accumulation on agricultural enterprises in the 90-s, in Russian], Nikonovskie čteniya 2000, Rynočnaja transformacija sel'skogo chozjaistva: Desjatiletnii opyt i perspektivy, Enciklopedija rossijskikh dereven. Moscow/Russia.
- SVETLOV, N. (2000): The Russian agrarian reform: Implementation, results and problems, Mansholt seminar, Wageningen University, Wageningen/The Netherlands.
- SVETLOV, N. M. (2002a): Factors affecting farm production in the Moscow Region, in: HINNERS-TOBRÄGEL, L., HEINRICH, J. (eds.): Agricultural enterprises in transition: Parallels and divergences in Eastern Germany, Poland and Hungary, IAMO, 29-30 September 2002, Wissenschaftsverlag Vauk Kiel KG, Halle (Saale)/Germany.

- SVETLOV, N. M. (2002b): Possibilities to overcome the lack of working capital at the agricultural enterprises [Puti preodolenija deficita oborotnyh sredstv na sel'skochozjaistvennyh predpriyatijach, in Russian], The 6th International conference of NAEKOR, 23-24 May 2002, Izdatelstvo MTAA, Moscow/Russia.
- UZUN, V. Y. (2001): Formy organizacii sel'skochozjaistvennogo proizvodstva v Rossii [Organizational types of agricultural production in Russia, in Russian], USAID BASIS Conference, Golitsyno, IET, 6-7 July 2001.
- VARSHAVSKY, A. (2000): Neplateži i barter kak projavlenie sistemnyh transformacii [Arrears and barter as system transformation, in Russian], *Voprosy ekonomiki*, 6, pp. 89-101.
- YANBYKH, R., YASTREBOVA, O. (2002): Credit policy in Russia: Building a strategic vision against short-term remedies, mimeo.
- YASTREBOVA, O. (2001): Kredit, finansy i investicii v sel'shom chozjaistve [Credit, finance and investments in agriculture, in Russian], *Agro-Food Centre Bulletin*, 3 (9), pp. 17-21.