

EU ENLARGEMENT AND CAP REFORM: MODELLING AND INFORMATION AVAILABILITY

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1. AGRICULTURAL SECTOR AS OBJECT OF EU CAP POLICY ANALYSIS

Fundamental changes in European agricultural sector and its related policies, which started already in last century, provide new tasks also for economists in order to project the impact of the changes onto the sector- on European and also national levels:

- How the markets will develop;
- What and to whom the policy costs will be;
- How the structures will change;
- Will the rural development be promoted in fact?
- Who will be the beneficiary?

Of course, this paper can't answer all the aspects and details of the answering procedures. However, the knowledge gained by the researchers of Latvian economists during their attempts to project the influence of joining to EU on the national agricultural and also rural sectors, as well as the monitoring of CAP reform development and the assessment of its possible impact, initiates us to share the experience also with our colleagues - policy analysts and the information providers for these exercises.

The main thesis are:

- The rural people but the production becomes the core of the European agricultural policies.
- Current policy changes require new approaches for the sector and policy analysis and also the new indicators to be provided by the information gathering services.

The products of the agricultural sector - what are they

Food and fibre

Since the introduction of CAP in early 60-ties of the last century, the ensuring people with food was the main goal of the policies. And the core of CAP was to facilitate the food production, using market support policies and, later - the production controls. Even the introduction of the system of compensatory direct payments and Rural development measures did not change the CAP much, because in the most of the territories they were only the accompanying measures, not tended to have an impact

on markets. Also the “fair income” principle to the agricultural society was ensured through the channelling of the support via production of food and fibre related measures.

Agri-land

Just the introduction of the cross compliance schemes in the CAP has added really new features. It has enforced to think about the impact of new obligations on the competitiveness of the farming sector: whether the level of compensation paid by the society for such a practices is sufficient to cover the additional costs occurred or the profits lost. It also gives an intention to try to quantify the environmental impact as the output of these policies. Once there are costs and also the output, we can speak about a separate product of agricultural production, named, for example - “agri-land”, which may be highly demanded by the society.

Rural human resource

The decision to continue the process of decoupling the agriculture support payments also from the production resources involved in the production and even from the production activities at all, provides the researchers with a new task - to quantify the impact of agricultural holdings and the people, currently involved in agricultural production, on the sustainable viability of rural territories. Because, the first step made- decoupling the former production related support channelling from the obligation to produce agricultural goods as it is suggested in the proposed CAP reform, will cause the discussion about the extending the payments on all rural businesses or even rural households. This discussion might give an answer, whether the payments provided will be sufficient to compensate some disadvantages in competitiveness of rural businesses in order to keep the holdings viable in rural territories.

Therefore, the suggestion is: in order to get a proper evaluation of the new policy incentives we should clearly define few new products of the agricultural sector and also its related policies in addition to food and fibre:

- **agri-land**, which could be characterised, for example as kept open landscape with nature friendly and environment non-polluting production practices;
- **agri-man** - an active person, living in countryside and dealing with some rural territory related business.

The need and characteristics of those products are defined in the CAP reform documents. Just the market value and the costs of production have to be evaluated. And the reaction of the society as a buyer and the rural people of the seller on the prices and costs should be investigated.

Enlargement of EU - other challenge for the economists

There are some other challenges for the economists dealing with the sector analysis and projecting the policy impact on the sector development. The enlargement of EU, and its agricultural sector causes them.

Assuming no changes in the current EU CAP, the enlargement covers several aspects of interest, valid for the both parties:

- Increase in the land and human resources available for agricultural production, although being used with different production intensity levels. The convergence of the productivity levels could contribute to the increase of production levels and, finally- also the market surpluses, the utilisation

possibilities of what are limited by further world trade liberalisation processes. It also could have a significant impact on rural unemployment problem.

- Adjustment of formerly different policies. The policy makers worry about the attribution of the same support measures and levels to the producers in new member states, which would motivate them to use more intensive technologies, thus increasing the environmental pressure. At the same time the decreasing support levels will impact the old member states.
- Globalisation of European food market and the capital costs of food safety. The joining of the acceding countries to the EU will mean also accelerated refurbishing of the food production capacities in order to meet the high EU food safety standards, causing also a rapid convergence in productivity and efficiency levels.
- Agrarian reform, still taking place in the acceding countries. Last but not the least important aspect of the reforming European agriculture is the continuing agrarian reform. During just one decade after the reintroduction of private farming, at least twice the policies have changed already in the most of CC - 10 countries. Leading to the *double producers' structure* in almost all the East European countries: well developed *commercial* farming sector with capital intensive production technologies and requesting high skilled labour, from one hand, and broad *semisubsistence* farming sector, frequently without other job opportunities in the reasonable distance, and still having to choose its development strategy - to develop commercial farm or to quit the business, and requesting the appropriate state policies - from other hand.

All this creates additional difficulties for the analysis of the impact of CAP and its reform on the new member state in the enlarged Union.

2. DATA ISSUES AND MODELLING OF CAP IMPACT ON THE DEVELOPMENT OF AGRICULTURAL PRODUCTION

The analysis of the impact of agricultural policy on the development of agricultural production usually is the most developed part of analysis related to agricultural sector in terms of methodology and methods applied on various aggregation levels.

Taking into consideration relatively complicate nature of interactions between the different economic processes, which should be formalized, as well as the different aspects very often covered, the mathematical modelling has become the most spread method of the research, when the policy effects on the development of agricultural sector are evaluated. However the application of the mathematical models sets up rather strict requirements to the data used in the research.

Requirements to the data quality mostly refer to the data reliability, their degree of representativeness and consistency. In order to increase the reliability of data it is very important to use the information sources, which are based on the concrete, well-elaborated methodologies of data collection and treatment as for instance the national statistical bureaus or FADN database are.

The theoretical data requirements, which come from the modelling theory, introduce additional requests to the indicators applied in the economic analysis. The indicator should be really representative for the description of given economic process or tendency and it should express the levels of development, but not the isolate cases of economic fluctuations. Therefore the average levels of indicators are more preferable

to use in quantitative assessments instead of certain value in definite moment of time. That is why sometimes it is quite problematic to use the information provided by custom declarations for analysis of export and import flows on aggregate (sectoral) level or, for instance, to attribute the results of small polls, arranged by Agriculture Advisory centres or other institutions, on agricultural sector as a whole.

Construction of time series in case of econometric modelling approach or operation with large data arrays, when optimisation approach is carried out, makes the data consistency as one of the most important prerequisite for successful results of the research. The certain level of data consistency might be achieved, if the similar technologies of data collection and treatment are applied for sets of information going to be analysed. Therefore for the modelling purposes it is much more easier and preferable to operate with statistical information, particularly with annually created balances for main agricultural products, which, in Latvian case, were provided by Ministry of Agriculture until 2000, but later by Rural Support Service, since it was founded.

However, even do not taking into consideration the pure data quality issues, it is necessary to point out several important data problems, which in a certain degree are identical (similar) for all countries and particularly for countries being in transition.

In our view three major groups of problems related to the data issues could be stressed when development of agricultural sector is modelled responding on the possible changes in agricultural policy. These are:

- Simply data scarcity problem;
- Problem of relatively short development trends during certain periods of time, usable for quantitative analysis;
- Problem of trends' stability, when essential political and economical changes take place.

For the purposes of better illustration of data problems mentioned, let's consider all of them on the example of Latvian agricultural sector analysed with the help of dynamic, partial equilibrium, commodity *AG model*¹ being under the elaboration for EU-25² countries within the 5th framework project "Agricultural Sector in the Member States and EU: Econometric Modelling for Projections And Analysis of EU Policies on Agriculture, Forestry and The Environment" (AG-MEMOD).

Lack of data

If one is going to analyse the development of agricultural sector as a whole, then annual balances constructed for all main agricultural products might become the bases for such research, because they provide the general picture of the sector and, at the same time, quite consistent set of data characterised the sector from different aspects as production and further utilisation of agricultural output, level of self-sufficiency for each product considered as well as foreign trade flows and stocks. Thereto such

¹ Building of AG model is based on the principles similar to EU GOLD model described in 1) "The EU GOLD model 2.1. An introductory manual" prepared by Kevin F. Hanrahan in 2001 (<http://www.tnet.teagasc.ie/agmemod/downloads/goldmanualdft.pdf>) or in 2) Westhoff, P. "Selected Equation from the EU Grain, Oilseed, Livestock and Dairy (EU GOLD) Model, version 2.0.", June 200. Mimeo, FAPRI-UMC.

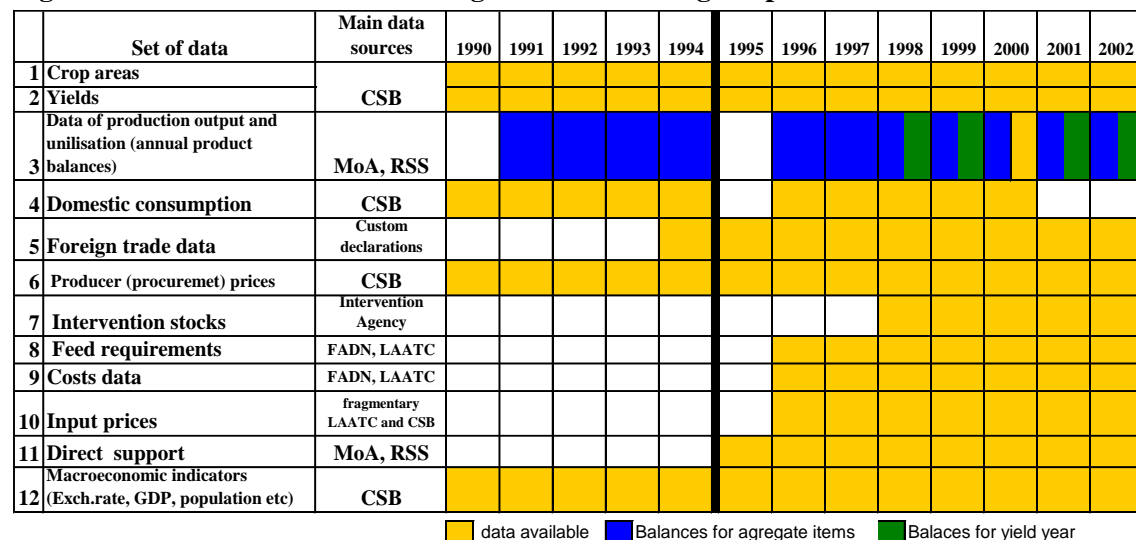
² Including EU-15 and 10 NAS countries

general static illustration of the sector could be observed also during certain time period (of course if data are available) giving the information about the shifts among the most important component parts of the sector.

However analysis of the policy impact on the development of the sector requires more deep and detail analysis, which might not be limited by consideration of issues provide by product balances and which should take into account the levels of production costs, production efficiency, level of market prices and concrete mechanisms of state support policy.

Figure 1 reflects all main indicators or data sets relevant to the analysis of policy effects on the example of Latvian grain sector, which historically is one of the most important branches of Latvian agriculture with 16% share in total agricultural output³. As it was said before the product balances could provide the major part of the data necessary for describing of agricultural sector including Latvian grain sector as well. However since the beginning of transition grain balances, for instance, were not designed at all for several years (see Figure 1). For other years balances' data are not consistent, because sometimes they were created for calendar, but sometimes - for crop years. For majority of years balances are available only for aggregate "grain" item and do not allow observing the information about different types of grain as wheat, barley, rye etc. The lack of consistent information for grain sector could partly be compensated by other data sources. However all of them are able to provide fragmentary information, which very often is not consistent as well.

Figure 1. Data available for Latvian grain sector during the period from 1990 to 2002.



For instance rather detail data about export and import quantities could be obtained from the custom declarations, but such data are available only since 1994 when Harmonised Commodity Description and Coding System was introduced in Latvia.

Some necessary data items could be defined as very problematic for all European countries, for example cost data or input prices. In Latvian case some of them partly could be provided by FADN database or by National Statistic bureau, but expert estimations still are needed in order to complete the necessary model inputs.

Availability of information for Latvian grain sector at least, gives possibility to conclude that since the beginning of transition the scarcity of reliable, consistent information is observed in Latvia similar to other countries in transition. That is why

³ according to the EAA data in 2001.

the usage of econometric modelling approach particularly on the base of time series' analysis sometimes becomes a rather hard. While the transition period were started since the beginning of 90-ies for majority of CEEC countries, in Latvia more or less consistent time series could be built starting with year 1995, when obviously more information become available about different aspects of agricultural production (see Figure 1).

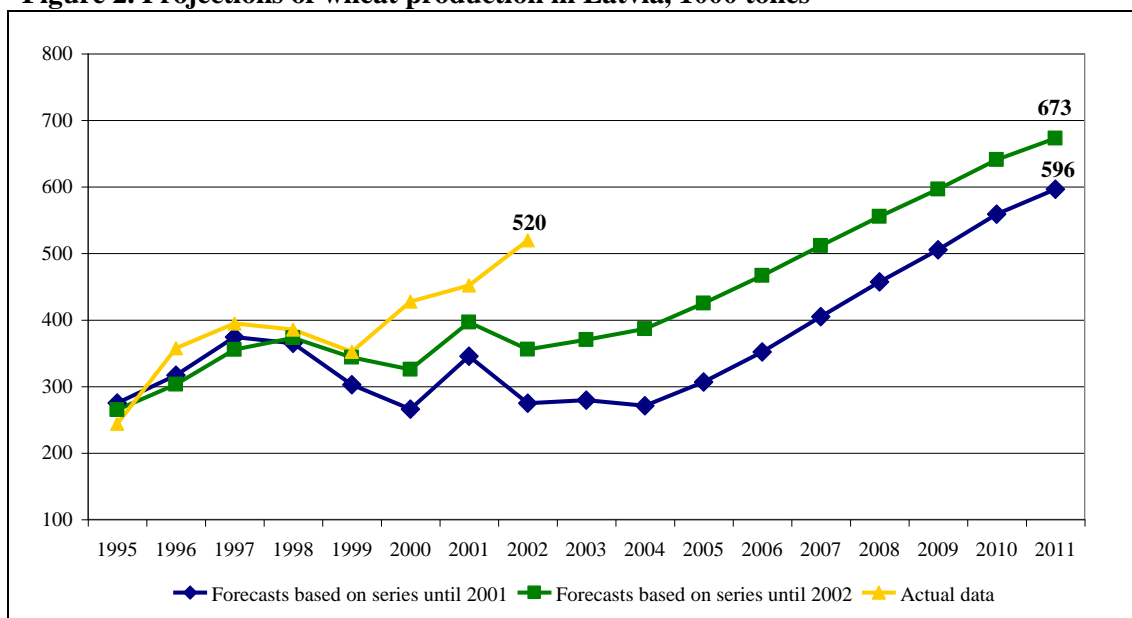
The problem of relatively short development trends for long-term analysis

As it was shown on Figure 1, the greater part of information, which might serve as a basis for agricultural sector analysis (particularly data about costs level and input prices, foreign trade and etc) became available only since the middle of 90-ies, when consistent parts of market information system gradually started to develop in all post socialist countries. Moreover only since that period the introduction of national support policies on the ground of European patterns were carried out in agricultural sector. For instance the intervention mechanism was introduced in Latvian grain sector only in 1998. But Latvian agricultural producers have become a subject of state support policy in the way of direct subsidies since 1995.

All these specificities mentioned, essentially reduce the length of time series could be applied in economical studies based on econometric modelling approaches. Sometimes only 4 or 7 annual observations are available for dynamic series. As a result the long-term forecasts built on the ground dynamic series' analysis and extrapolation principles gives quite unrealistic and unstable effect.

For instance figure 2 illustrates how essentially might differentiated the results of forecasts if one additional observation would be added to the time series with 7 observations available. Since 1995 the wheat production is characterised by stable tendency to increase in Latvia. However a simple including of wheat production level from 2002 into the dynamic series observed is able to increase the forecasted value by 13% in 2011.

Figure 2. Projections of wheat production in Latvia, 1000 tones



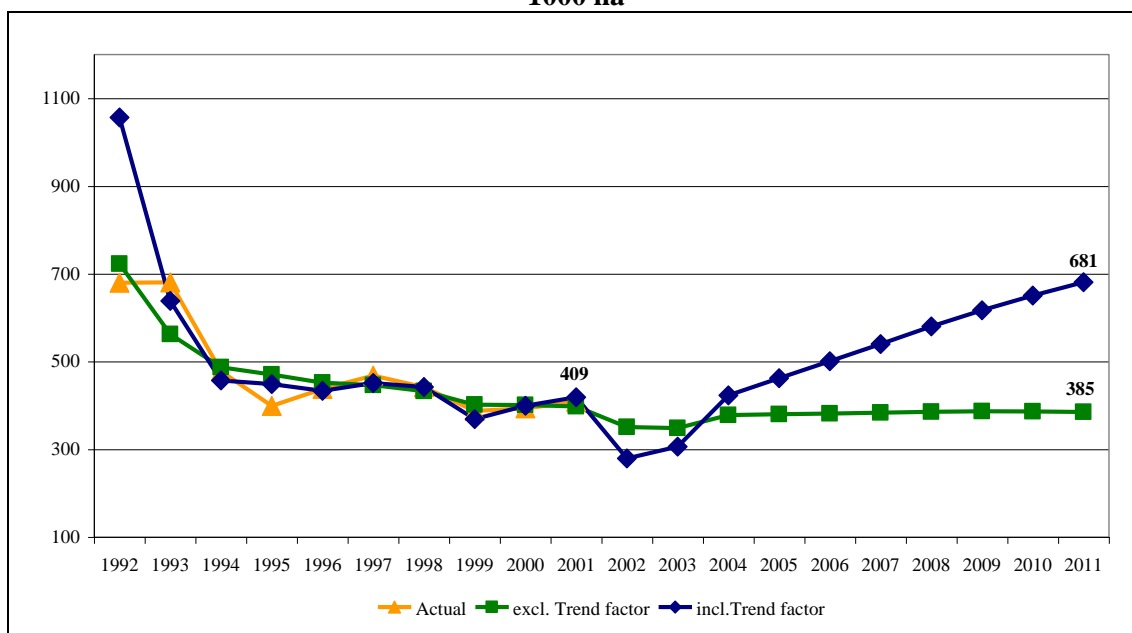
Source: according to LSIAE calculations

Another example could illustrate the problems related with usage of time factor (trend) in long-term projections base on relatively short dynamic series. Figure 3 reflects the projections of harvested areas for four grains, cultivated in Latvia, in two

cases: when time factor is included and excluded from the forecasts' building procedure.

Taking into account that during the simulation period until 2011 the values of time factor could increase considerably, substantial gap in values forecasted for main grain areas could be observed. In 2011 the area harvested will be able slightly decreased since 2001 (up to 6%). At the same time if trend factor is included in the econometric model, the areas considered might increase per 67% in 2011 comparing with 2001.

Figure 3. Projections for total area harvested for wheat, barley, rye and oats in Latvia, 1000 ha



Source: according to LSIAE calculations

Thus usage of relatively short dynamic series for calculations of long-term forecasts sometimes gives quite unrealistic and unstable results.

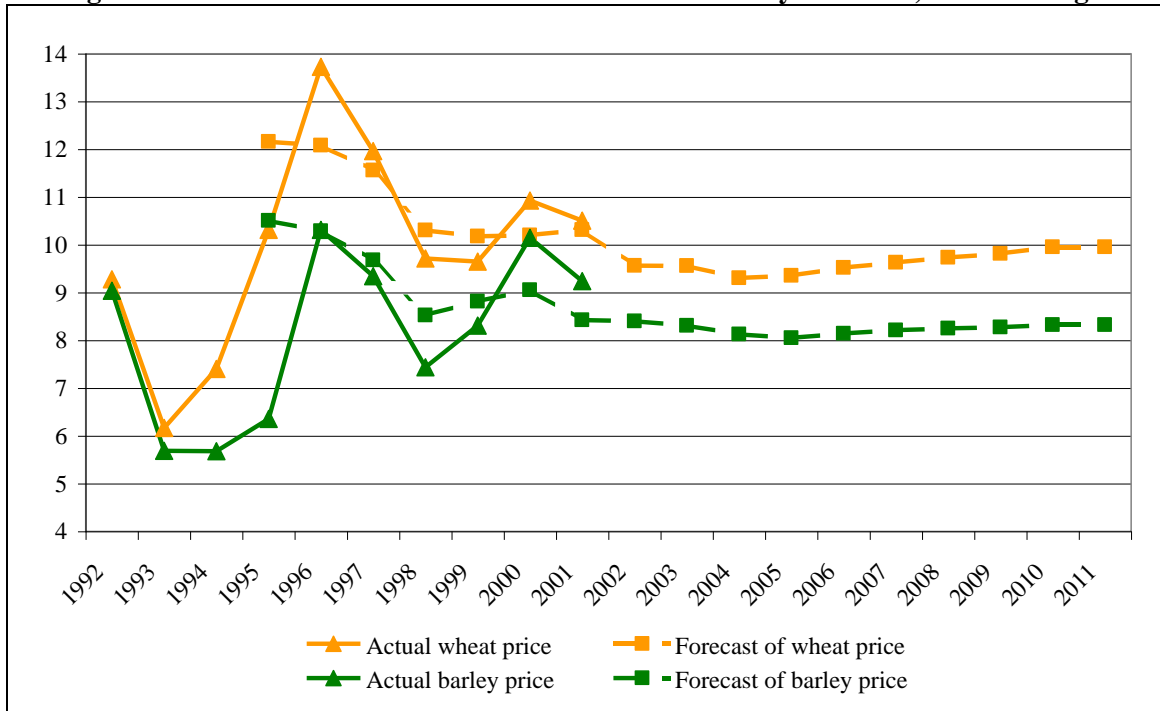
The stability problem in the analysis of development tendencies

The last data problem, which is relevant for mentioning when agricultural policy impact on agricultural production is analysed particularly refers to the CEEC countries.

Since the beginning of transition the replacement of the centrally commanded administrative system to a free market one, transformation of farming structure, reorientation to the new input and output markets, as well as the introduction of national support policies were carried out in agricultural sectors of these countries. Several additional shocks like banking crisis and Russian economic crisis also have given their impact on the development perspectives. That is, why the transition period is characterized by instability and by essential fluctuations observed in tendencies developed in the nearest past. For instance, Figure 4 shows the price fluctuations taken place in Latvia since the regaining the independence and introduction of market-orientated economical principles.

Usage of dynamic series built for the time periods, when serious economical and political transformations happen, essentially increases the uncertainty for the projections are going to be made. Such uncertainties do not allow building reliable forecasts even for rather short time horizons. Such obstacle for long-term econometric analysis corresponds to the strict theoretical modeling principles and requirements as well.

Figure 4. Price forecasts for different for wheat and barley in Latvia, EUR/ 100 kg



Source: according to LSIAE calculations

Therefore it would be much more reasonable to avoid the application of extrapolation principles in projection building procedures. For such purposes the synthetic econometric or optimisation models could be used in the combination with the expert estimations, in order to increase the reliability of projections for relatively long time horizons.

3. CAP AND RURAL DEVELOPMENT - OPPORTUNITIES AND OBSTACLES FOR POLICY IMPACT ANALYSIS

Beside the above described data problems, also the recent developments in agricultural and rural policies provide the researchers with new tasks.

Clear switch from the commodity production related policies towards territory development related goals and measures is taking place.

At the same time the assessment of the impact of these policy changes still needs some improvement.

First of all, because it needs a clear definition of the parameters and the variables to be used in the research. Once the production still is a core of the policy, a set of the production indicators and its related policy and, also input use, parameters should be defined. Referring to that was said earlier, regarding the requirements to the data used in the research, let's consider the data availability for the CAP reform analysis.

Figure 5 gives an illustration of the agricultural policy development, taking place nowadays. The development trends of the both CAP pillars may be analysed from the policy output aspect, where the quantifiable indicators can be used. In the most developed part of the policy impact analysis, corresponding to the impact of CMO related policy measures onto the production volumes and the market revenues, a well known set of indicators, like level of production factor use, prices, trade flows and others are used. The policy object can be quantified as production volumes, and the

production, price and trade statistics as the information sources are relatively well developed in most cases.

The evaluation of the impact of rural development measures environmental resources and also of the CMO related measures onto the territorial development in the most cases leave a lot of space for improvement.

Our suggestion is, that not existence of clearly defined policy outputs (agri-land and agri-man, for instance) and correspondingly non availability of quantified indicators is the first reason of this. We can only assume some natural indicators, which could be used in such the evaluations (for instance - an area of land processed with a good agricultural practice approach, share of open landscape, share of people engaged in agriculture in the total rural employment, volumes of agriculture originated water and air pollution), while the sectoral economic models require the values in monetary terms.

Figure 5. Components of CAP reform in the policy and the quantitative analysis of the sector

| | | Set of CAP policy measures | |
|--------------------------------------------|-------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------|
| | | <i>CMO measures</i> | <i>Rural development measures</i> |
| Policy object - Agricultural sector | Production of agricultural products | Volumes and structure of agricultural products | Competitiveness of agricultural producers with limitations in production practices |
| | Agri - environment | Density of agricultural production and amount of resources involved | Sustainable use of environmental resources |
| | Production of non - tradable goods | ... | Agri- land, Agri-man |

| | |
|--|------------------------------------------------------------|
| | The most developed type of quantitative sector analysis |
| | Fragmentary developed part of quantitative sector analysis |
| | The most complicated part of quantitative sector analysis |

Source: LSIAE

As the other reason, which does not allow reaching better results at least in Latvia and also other Baltic countries, even using natural indicators, not well developed territory related statistics might be mentioned. Most of the available indicators are aggregated

on the country level, and don't discover the differences in agriculture development and its role in territorial development of countryside.

For instance, GDP and GAP are estimated only for the whole country and by the institutional sectors, which has nothing common with rural territories comparing to urban ones. At the same time, statistics, providing the imagination about the non-agricultural production and other business activities of the rural holdings, currently involved in agriculture, are not available at all. Also the employment statistics don't give sufficient information about the structure of the use of rural labour resources.

4. SOME CONCLUSIONS

Fundamental changes in European agricultural policies provide new tasks also for economists in order to project the impact of the changes onto the sector- on European and also national levels, especially regarding the rural development policy measures.

A set of new policy indicators is needed to project the impact of the spotlights of CAP reform, when rural people but the production becomes the core of the European agricultural policies.

New agriculture policy outputs, for instance - 'agri-land' and 'agri-man' in addition to food and fibre commodities could be introduced and quantified in order to cover also the rural development component of agricultural policies in the complex quantitative analysis of agricultural and rural sectors.

The mathematical modelling is the most reasonable tool in analysing the likely impact of policy and other changes on the agri-food sector, and the econometric models are the most available tool in this research.

However, agrarian and macroeconomic reforms, carried out in acceding countries create additional difficulties for the analysis of the impact of CAP and its reform on the new member state in the enlarged Union, because the previous reforming has not been finished yet and also several transition shocks have occurred during recent decade. Also short data time series don't provide the researchers with stable production and other developments trends, which limits the opportunities to use the econometric models in policy analysis in Latvia and also other Baltic countries.

It would be more reasonable to use the synthetic econometric or optimisation models in the combination with the expert estimations in projection building procedures, in order to increase the reliability of projections for relatively long time horizons.

Current agriculture policy changes require new rural territory related indicators, to be provided by the information gathering services, in order to include multifunctionality aspect of agriculture into the development projections.

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