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# Preface

Hungarian agricultural economists have long lacked an English journal published in their own country. The Research and Information Institute for Agricultural Economics (AKII) in Budapest has issued a research bulletin for decades.

Now the AKII, cooperating with Committee for Agricultural Economics of the Hungarian Academy of Science, wish to publish the bulletin entitled "Studies in Agrucultural Economics" in the form of a scientific journal.

The scope of this journal is characterized by the following.

- It covers topics of agricultural economics in a broad sense (the whole agribusiness, including microeconomic, social, regional environmetal and other aspects, as well as quantitative methods of analysis).

- The journal is destined first of all for the publication of research results, not excluding occasional reviews of important books, conferences or even firms.

- The journal primarily targets foreign readers by containing Hungarian research reports but also papers about the European Union or international matters.

This journal is now open to experts at Hungarian universities and research institutes but also to foreign authors. Every draft will of course be peer reviewed. We wish to receive thorough papers containing new research results.

We hope that this yournal will contribute to make Hungarian research results better known abroad, enhance communication among Hungarian and foreign agricultural economists and will help dissemination of special Englich terminology among Hungarian authors and readers.

Budapest, 19th May 2003

István Szűcs,Chairman                                    Sándor Mészáros,Editor – in – Chief

# Readiness of Czech agriculture for EU accession

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## Abstract

In Part 1, the paper presents characteristics of present Czech agriculture as a consequence of more external factors (agricultural policy, legislation for property transformation, etc.) influencing its development during the reform period since 1989. It is argued that the reform of Czech agriculture as a parallel process of property transformation and farm restructuring has not yet been completed. There are more barriers to restructuring, especially barriers on the land market. In Part 2, possible impacts of EU accession on the economy of main agricultural commodities are assessed. Signal information derived from the application of structural models shows positive impacts on the profitability of all commodities assessed even in the case of reduced EU supports (direct payments), except for pork and poultry.

### Key words

Czech agriculture, agricultural policy, transformation, restructuring, EU accession, commodities, profitability

## Introduction

Let us suppose the Czech Republic (CR) will enter the European Union (EU) in 2004. Czech agriculture will find itself under the Common Agricultural Policy (CAP), custom frontiers between EU-15 and new EU countries will disappear, and the full acquis and the free movement of capital (with exceptions given by agreed transitional periods) will function in CR. A key question, which the Research Institute of Agricultural Economics Prague (RIAE) has been trying to elucidate for a longer time, is the readiness of the Czech agriculture for the new conditions.

The paper focuses on analytical findings of the RIAE in the given topic. An analysis of the present situation of Czech agriculture (part 1) is followed by an assessment of potential impacts of EU conditions on the economic position of the main agricultural commodities (part 2). The predictions are conceived by variants, because the future parameters of the CAP are still under negotiation. The conclusions are oriented on the summary assessment of the readiness of Czech agriculture for EU accession.

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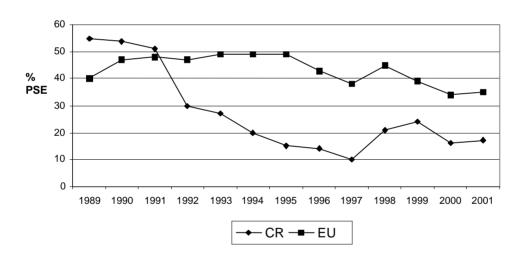
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# 1. Present situation of the Czech agriculture from the point of view of its readiness for EU accession

## 1.1 Main factors influencing the development of Czech agriculture during the reform period

Czech agriculture has developed during the reform period under conditions, where subsidies have been only half on these in the EU. Expressed by the Producer Support Estimate (% PSE), the average level of supports for Czech agriculture in 1999 – 2001 amounted to 19 % compared with 36 % in the EU (see figure 1). The difference is also caused by the level of custom tariffs for agricultural products, in the CR being about 2 – 2,5 times lower than in the EU.

Figure 1

**Supports for agriculture in the CR and in the EU in 1989 - 2001 (% PSE)**



Besides this, the Czech pre-accession agricultural policy has (particularly since 2001) a structure different from the present CAP: whilst almost 90 % of the EU financial sources for agriculture are devoted to market price and production supports and only 10 % of the sources are oriented toward structural supports, Czech agricultural policy only invests 70% of domestic sources on market and production and more than 30 % of the sources are oriented toward the structural development of agriculture.

Price relations on the Czech agrarian market have developed in two phases. During the first phase in 1990 – 1992, the price liberalisation and the abolition of consumers` subsidies for foods were carried out. New price relations substituted "non-market" prices from the pre-reform period, with an extreme squeeze of the "price scissors" on prices of inputs and farm-gate prices (FGP). The second phase after 1992 has been characterised by

only a mild squeezing of the "price scissors": price index 2001/1993 for agricultural inputs is 146,8 % and for FGP 135,8 %*3* (figure 2).

Figure 2

**Price developments (1993 = 0)**



In addition to the mentioned factors, the process of property transformation of agricultural capital has strongly influenced the development of Czech agriculture. The property transformation – being also a process of the initial allocation of agricultural assets – was carried out (and still continues) according to transformation laws in the following forms:

- Restitution of agricultural assets, which has two sides: restitution of ownership rights (suppressed in the previous regime) and restitution of ownership titles (for previously expropriated assets). Main part of (primary and secondary) restitution was realised in 1991 – 1993 and based on it, especially individual (family) farms emerged.
- Transformation of coops as a specific restitution and as the process of the establishment of new succession farms. The transformation of coops was carried out in 1992 – 1993. The assets of coops (excluding land and original deposits of members) were distributed among designated persons according to invested land, other assets and labour. A part of assets of the designated persons, who did not decide to be members of the succession farms, was left on the farms in the form of the so-called transformation shares as a future debt towards the mentioned designated persons.
- Privatisation of agricultural non-land assets, which occurred in 1994 – 1995, included combinations of restitution and privatisation.
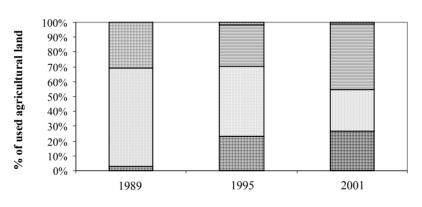
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*3 It is not without interest that price index 2001/1993 for consumer food prices reaches 142,5 %, whilst the CPI (ConsumerPrice Index) has increased by 173,7 %.*

## 1.2 Present situation of Czech agriculture as a consequence of past dependencies and reform processes – is the reform of Czech agriculture completed?

The initial allocation of capital on farms and the emergence of a new farm structure were consequences of the property transformation during 1991 – 1995. About 75 % of agricultural land left in usage on large coops and companies (it is collective farming) and about 25 % of agricultural land used individual farms (from 1 ha up to 3 000 ha). These farms' structure has remained unchanged since 1995 and only inside the category of farms as legal entities did the number of companies increase to the detriment of coops (see graph 3). The driving force of these changes has been an effort by coops to avoid allowing the transformation shares to go to non-members and to enhance the flexibility for agricultural capital.

Figure 3

**Farm structure development 1989 – 2001**



The new farm structure shows a marked dual character (see figure 3). From the total number of 37 thousand farms (with land) only 5,2 % of farms use 76,4 % of agricultural land. To the contrary, the share of farms 10 ha amounts to 58,2 %, but the farms use only 1,9 % of agricultural land. The share of individual farms with more than 100 ha extends to more than 60 % of agricultural land in the given farm category. As a consequence of the applied transformation laws, the large majority of land on farms is leased (92 % in average) from landowners, and this is from private persons and the state and partly from municipalities.

Czech agriculture has to some extent adjusted to the reform economic conditions during 1989 – 2001. Compared with 1989, gross agricultural output declined by 30 % (crop production by 23 %, livestock production by 35 %) and the number of workers dropped by more than 70 %. Labour productivity has increased 2,4 times, the share of primary agriculture in GDP decreased to about 2 % and the share of agricultural employment to about 3,4 %. The yields in livestock production have outstandingly increased (in milk production by more than 40 %), whilst yields in crop production – except sugar beet and some other commodities – have declined (in cereals by nearly 10 %, in oilseeds by more than 11%).

It all brings into consideration the question of whether the reform of Czech agriculture is already finished. If we consider the reform as a parallel process of property transformation

(and the initial allocation of capital) and as a process of restructuring of farms regarding their basic adjustment to new conditions and a significant improvement in efficiency, the answer to the question is still negative.

Speaking about property transformation and about allocation of capital, there are more external factors, which can significantly interfere with the present farm structure in the near future. It is especially a question of:

- Completion of the restitution of agricultural assets: about 3 % from the total number of the restitution claims are not still settled. There are large moreover, there remain politically unresolved demands by the church on land.

- Privatisation of state land: according to the law from 1999 about 500 thousands ha of agricultural land shall be privatised (from the total acreage 770 thousand ha of agricultural owned by the state). However, only about 10 thousand ha had been privatised by the end of 2001. Criteria for privatisation can essentially intervene in some farm categories.4 Only Czech citizens are eligible to buy state land.

- A solution for the high indebtedness of farms: Farms have accumulated three generations of debts during the reform period: old pre-reform debts to the state, the so-called transformation debts (transformation shares of coops, interest free state loans for starting a farm, debts for privatised assets) and new bank credits (supported by the state as usual) on modernisation. The state already intervened in the transformation debts and tried (still without success) to change the transformation law to solve transformation debts of succession farms forward former coops. Those farms owe private persons (including individual farmers) about 13 mld. CZK and utilise this capital free. The initial allocation of capital in agriculture is thus still encumbered by inequity. It is most probable that the state will intervene in writing-off the debts in the pre-accession period, even though morally questionable.

- Penetration of foreign capital into agriculture sharpens competition for land leasing. Foreign capital, much stronger than domestic, intrudes into the present farm structure and land usage. Nevertheless, land market development and disclosure of land market prices are positive effects.

Even restructuring of Czech agriculture is not completed. During the reform period allocation, orientation and dimension of production on farms have changed and farms to some extent have adjusted themselves to price relations for labour, land and capital. However, their restructuring – especially from the point of view of future conditions – has to continue particularly in the following ways:
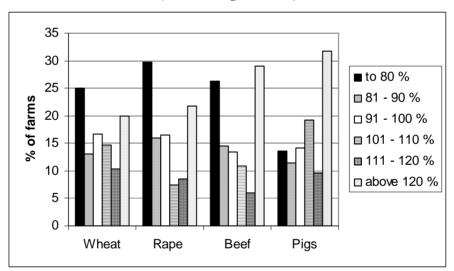
- Simplification of internal structure of farms: Coops and joint stock companies, representing the vital categories of farms in Czech agriculture, battle with extremely intricate internal relations, with conflicts of interests among working (self-employed) and non-working owners, hired workers, hundreds of land owners and owners of other capital (e.g. owners of transformation shares). Management has been dealing with conflicts particularly with self-employed owners. However, the proportion of these workers has been year by year

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4   *Particularly farms which privatised agricultural non-land assets in 1994 – 1995. According to the law, these farms have a prior claim to gain 50 % of their leased state land, but only 300 ha maximum. However, the privatised farms are often farming on 1 000 and more hectares and they privatised other agricultural assets suitable to the acreage.*

declining and the "manoeuvring room" for management has been thus growing5. It should be considered that the distribution of value added generated on farms (including supports) is attained through these intricate relations 6.

- Improvement of farm efficiency: present Czech agriculture is characterised not only by its dual farm structure, but also by an extreme dichotomy in farm efficiency. There are a large number of very effective farms (especially larger individual farms and some well-managed companies), but approximately the same number of inefficient and non-profitable farms survive (NOVÁK 2002, MATTHEWS 1999, MATHIJS 2001, DAVIDOVA, RATINGER 2002). For example, the range of unit costs for agricultural products is extremely large (see figure 4): one fifth to one quarter of farms had in 2000 their unit costs lower than 80% average unit costs and almost the same number of farms presented their unit costs by 20 % higher than average). A similar picture gives the view on farm profitability (see figure 5). Larger farms (particularly those located in better natural conditions) due to their economy of scale show the better total factor productivity (see figure 6).

Figure 4

**Frequency distribution of farms by their level of unit costs**
**(2000; average = 100 %)**



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Figure 5

**Frequency distribution of farms by their profitability in 1999 (IDARA project)**



CB+ = costs/revenues - subsidies + opportunity costs
CB- = costs/revenues + subsidies - opportunity costs
IF = individual (private) farms          LLC = limited liability companies
JSC = joint stock companies              COOPS = co-operatives

Figure 6

**Total factor productivity (TFP)[1] by farm categories and production regions (1998-1999, IDAA project)**



**Farm category/Production region**

[1] Thornqvist-Theil index:  Input output ratio (see Capalbo, Antle 1998).

- Increase of the economic (financial) stability of farms: Czech farms are heavily indebted (see transformation). The ratio of debts to equity (leverage) amount to 0,8 in average (in Hungary 0,4), the ratio of debts to the total assets amount to 0,44 in average (in Hungary 0,16).

- Substantial improvement of co-operativeness and organisations of farms in their interaction with up and downstream firms, or in their penetration into up and downstream sectors, respectively. Present Czech agriculture shows a diversion of interests, whose background is conflicts of interest in economic matters (the uncompleted property transformation) and also political aspects. Farmers' marketing organisations, established with state support, suffer from low discipline by members, which reduces their market power towards e.g. processors (milk, meat, fruits, vegetables).

Other aspects of restructuring can be coped with by a gradual adjustment of farms to economic and market conditions. The following are relevant:

- improvement of the allocation of production in compliance with natural and market conditions (the share of arable land in the total agricultural area is still inadequately high, about 72 %);
- changes in production orientation of farms, e. g. orientation toward non-food use, toward bio-products and regional products, diversification to non-agricultural activities, etc.;
- improvement of marketing orientation of farmers in the field of quality and food safety, animal welfare and production of public goods.

It should be added that restructuring shall go ahead also in the state administration, particularly in building efficiently running institutions with links to CAP and structural policy.

## 1.3 Causes of lower efficiency of the Czech agriculture and barriers for restructuring

The mentioned transformation laws and agricultural policy, in 1995 – 2000 oriented toward income supports and stabilisation of farm structure, belong to the most influential external factors. Among internal factors and causes there are especially:

- Lower technical efficiency, efficiency:
  - lower yields, which are - with respect to commodities - 20% lower by average than in the EU; especially yields of forage crops are lower (in the case of grassland about 50% lower than in the EU), with increasing demands for land needed for livestock production;
  - lower labour productivity, which amounts – in spite of the exodus of labour during the reform – to about 50 % of the EU level.;
  - higher unit consumption of variable inputs (feeds, fuel, etc.) and higher fixed costs and usually inadequate overheads costs.

The level of input usage to some extent corresponds with price relations of inputs (especially between prices of labour and capital including land). The input usage is also dependent on the initial allocation of capital and issuing from this, on the possibilities of a farm management to its adjustment[7].

- Lower quality of farm management: especially younger workers and workers with economic training left farms during the reform period. New farm

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[7] *The „bottom-up" approach, particularly enables individual farms, a better structure of capital than the "top-down" approach, as used at collective farms. These latter forms preserved a higher proportion of labour demanding livestock production and also due to their commitment to guarantee employment for their members.*

management, initially middle management, specialised in machinery, zoo and agro-technology, without economic and marketing training.
- Lower level of the co-operation and solidarity among farmers, constituting a barrier to the formation of common and effective marketing organisations.

Among the most serious barriers to restructuring are especially:
- insufficiently developed institutional legal infrastructure, e.g. the weak enforcement of contracts for farmers;
- insufficiently developed land market, to a large extent blocked by the slow progress in land consolidation in cadastres: only 203 cadastres from their total number of 13 000 have finished a complex land consolidation after 10 reform years;
- discrepancies between land ownership and land usage (92 % of land is leased on farms), creating impediments for long-term investments, for gaining (mortgage) credits and for new land usage (e.g. the conversion of arable land into grassland);
- already mentioned extremely intricate structure of interest groups especially on large farms (coops and joint stock companies);
- barriers to labour market: on the one hand there is a problem regarding protection of jobs for owners of farms (but the clout of self-employed owners has been expanding, as was already mentioned), on the other hand there is a shortage of skilled and specialised workers, including the succession generation on many family farms;
- economic and political division among of farmers.

A shortage of financial sources for modernisation and for some variable inputs (fertilizers, etc.) can also be ranked among the barriers. It is reality, however, that more than 60 mld. CZK of credits, largely used on modernisation, was pumped in state support into agriculture during 1994 - 2001. Rather than a shortage of machinery and technologies, there is question of effective utilisation of the new inputs. Above it, the purchase of machinery sometimes is not accompanied by an adequate reduction of labour, with overlapping of labour and capital intensive production.

## 2. Possible impacts of EU accession on the economy of main agricultural commodities

### 2.1. Prerequisites of predictions

The RIAE has been predicting and assessing for a long time possible impacts of EU accession on the economic position of the Czech farm sector. For this, it uses simpler structural models and the non-linear optimising model AGRO-3 form the basis of the RIAE. The impacts are oriented toward the horizon of 2004 – 2005 (short-term impacts), or toward the horizon after 2005 (long-term impacts). The baseline (comparative) period is the average 2000 (real figures) and 2001 (preliminary figures). The predictions are further based on the following suppositions:
- development of macro-economic variables for the CR and the EU (exchange rates, inflation, price of labour – preserving 75% parity towards agriculture) form models of the Czech Statistical Office, the Czech National Bank, etc. (VINTROVÁ 2002);
- future farm-gate prices in the EU from the OECD predictions (OECD 2001);

- growth of intensity in Czech agriculture (only as a consequence of the general progress – roughly 1,5 % per year);
- direct (commodity) payments in 2004 – 2006 by variants (0 %, 25 – 35 %, 100 %), and LFA supports 2004 – 2006 on the level and with the orientation as in the CR in 2001 (supports for grassland and for cattle breeding on pastures).

The production costs maintain the structure of the baseline. Investments on *acquis* in the field of food safety, animal welfare and nitrate directives are included in depreciations.

Limiting conditions are represented by the production limits according to the proposal of the European Commission (European Commission 2002), or according to the Czech proposals (Position Document of the CR 1999).

## 2.2. Results of predictions

Possible impacts on the economy of the main agricultural commodities are gathered in table 1. Under given suppositions it is possible to interpret table 1 by commodities as follows:

Table 1

**Economic position and competitiveness of the main agricultural commodities**

| Commodity | Farm-gate prices index 2004-2006/2000-2001 | | | % PSE average 1998-2001 | | P average 2000-2001 | | P - average 2004-2006 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CR, in percent | | | EU[1] index |
| | | | | | | | | 100% supports | reduced supports | 0% supports | |
| | CR | EU (in CZK) | EU (in EUR) | CR | EU | CR | EU | | | | |
| *Crop production* | | | | | | | | | | | |
| Wheat | 104,30 | 93,86 | 108,69 | -4 | 48 | 0,21 | 100 | 0,47 | 0,10 | -0,05 | -4,29 |
| Barley | 97,33 | 92,45 | 107,03 | -13 | 57 | 0,18 | 100 | 0,52 | 0,08 | -0,10 | -7,84 |
| Rape seed | 102,33 | 103,51 | 119,78 | -12 | 35 | 0,17 | 100 | 0,35 | 0,05 | -0,08 | -7,46 |
| Sugar beet | 145,21 | 86,43 | 100,00 | 21 | 52 | 0,21 | 100 | 0,43 | 0,43 | 0,43 | -9,43 |
| *Livestock production* | | | | | | | | | | | |
| Milk - ARL | 122,62 | 81,65 | 94,47 | 30 | 47 | -0,09 | 100 | -0,01 | -0,03 | -0,04 | -12,08 |
| Milk - GSL | 122,62 | 81,65 | 94,47 | 30 | 47 | 0,01 | 100 | 0,12 | 0,10 | 0,09 | -12,08 |
| Beef - ARL | 111,82 | 73,32 | 84,89 | 31 | 82 | -0,15 | 100 | 0,02 | -0,15 | -0,22 | -14,85 |
| Beef - GSL | 111,82 | 73,32 | 84,89 | 31 | 82 | 0,21 | 100 | 0,68 | 0,41 | 0,29 | -14,85 |
| Suckler cows | 111,82 | 73,32 | 84,89 | 31 | 82 | 0,15 | 100 | 0,45 | -0,02 | -0,23 | -5,48 |
| Pigs | 77,86 | 86,82 | 100,53 | 21 | 22 | 0,22 | 100 | -0,10 | -0,10 | -0,10 | -8,95 |
| Poultry | 89,98 | 84,19 | 97,44 | 42 | 35 | -0,02 | 100 | -0,17 | -0,17 | -0,17 | -11,76 |

1) Relative change to 2000-2001

PSE = Producer Support Estimate

P = total profitability = ((Farm-gate Price incl. Commodity Supports/ Unit Costs)-1)

ARL = category of cattle outside LFA and with forage area on arable land

GSL = category of cattle in LFA and with forage area on grassland (2000-1 incl. pastures)

Suckler cows: with calves to 280 kg lw transferred to store cattle

**Wheat, barley, rape seed**

- All given commodities show a high level of total profitability at present. The profitability ranges from 17 % (rape seed to more than 21 % (wheat).
- At the same time, all given commodities show the negative values of % PSE in the last 4 years. It is caused particularly by agricultural policy measures in exports (the licence policy limiting exports). On the contrary, EU producers are heavily subsidised (see barley – 57 % PSE) by CAP market price supports (tariffs, export subsidies), and by CAP direct payments.
- Under CAP conditions in 2004 – 2006 and compared with the baseline very minor nominal growth of prices for wheat and rape-seed are expected.
- After the entry, no scenarios with direct payments would generate losses in production. However, lower payments could worsen the economic position compared with the present situation. All given commodities could generate losses under the CAP without direct payments.
- To sun up, it is possible to expect that production of the given commodities shall continue to grow, but limited by the so-called basic acreage (including set-aside) and by the basic yield. Czech agriculture could develop as an important net exporter of the given commodities (especially if we consider a possible parallel decline in livestock production in the CR).

**Sugar beet - sugar**

- The producers of sugar beet and sugar in the CR and in the EU are functioning under similar market organisations at present. Under the given organisations sugar beet production is profitable in both regions (21% total profitability in the CR).
- Relatively high domestic farm-gate prices correspond with the high level of supports for domestic producers (21 % PSE in the CR and 52 % PSE in the EU as the average of 1998 – 2001).
- After entry, it is possible to expect more than 45% increase of farm-gate prices. In all scenarios the production of sugar beet would remain highly profitable (43 %) and the production of sugar beet and sugar would remain preserved at the level of the negotiated national quota.

**Milk**

- Milk production is basically provided by two technologies: in sheds with forage feed mainly from arable land and on pastures with forage feeds mainly from grassland in LFA. The present Czech agricultural policy additionally supports cows on grassland and in LFA. It is why milk production is divided into two commodities differing in level of supports – milk from cows on arable land (ARL) with minimum supports and milk from cows on grassland (GSL) with maximum supports, including LFA supports linked with grassland.
- Particularly in "stable fattening" technologies additional investments to comply with the nitrate directive should be considered, apart from higher labour inputs linked to these technologies.
- Milk in the CR and in the EU is among commodities with limited production through individual quotas. It also is among commodities with the highest

supports (30 % PSE in the CR and 47 % PSE in the EU, as the average 1998 – 2001). In spite of this, the production of milk in the ARL category of cows is not profitable on average; the production in the GSL category of cows shows a moderate total profitability (1,2 %).

- Compared with the baseline, milk farm-gate prices would increase by nearly 23 % after accession. However, the ARL category of cows may not be profitable even with 100 % of direct payments and only producers with lower than average costs would make a profit. The GSL category of cows with expected higher LFA supports would probably be profitable in all scenarios.
- Under expected conditions, milk production in the CR would have a good chance to survive and to develop, particularly if more production than at present is provided by the GSL category of cows. From this point of view, the national quota according to the EC proposals appears to be limiting both actual and possible production potential of Czech producers.

## Beef

- As in the milk sector, there are two commodities which differ by feed technologies – ARL and GSL. Besides this, there is a category of suckling cows with a specific importance linked to multifuntionality and with higher level of supports.
- Beef production in the CR and in the EU is heavily supported (30 % PSE in the ČR and even 82 % PSE in the EU, as the average 1998 – 2001). In spite of this, beef production in the CR is not profitable on average.
- After the entry, a slight increase of farm gate prices is expected (by about 11,8 % compared with the Czech baseline). Under reduced direct payments the ARL category of beef and in all scenarios the category of suckling cows would have problems with profitability. The future of suckling cows is connected with higher farm-gate prices for beef of higher quality, or with permanent and above-standard supports, respectively.
- Nevertheless, with a better utilisation of acreage for forage and feeds beef production could develop and fill the negotiated national limits for individual categories of cattle. However, the national quota for milk or a contingent capping of supports (e.g. only for 90 – 120 animals per farm) could limit beef production, provided now mainly in large-scale units.

## Pork

- Under the present high farm-gate prices, pig production in the CR shows outstanding profitability (22 % in average), even without any direct supports. High farm-gate prices in the CR and in the EU provide a relatively high level of supports (21 % PSE in the CR, 22 % in the EU, as the average 1998 – 2001).
- Pig production is not directly supported in the EU. According to the OECD predictions, the EU farm-gate prices in 2004 – 2006 will stagnate. It would cause entry, Czech producers after entry, a decline in prices in nominal terms by more than 22 % (compared with the baseline). Moreover, the Czech producers would have to invest to comply with the nitrate directives, animal welfare standards, etc.
- Under the expected conditions and without lowering production costs, the economic position and competitiveness of the average Czech producer would

worsen (by up to 26 %) and the production would not be even profitable (profitability –10 %).

- The future position of average Czech producer under EU conditions can be assessed as risky. Nevertheless, producers with under-average unit costs (especially some larger specialised enterprises without land, providing today about 60 – 65 % of marketed production) should be able to overcome risks, utilizing further (foreign) investments and other measures leading to a reduction of unit costs.

## Poultry

- As in pig production, the majority of poultry marketed production is provided by large specialised enterprises without land. According to the RIAE surveys and in spite of high farm-gate prices, poultry production is slightly unprofitable (-0,02) at present. The level of supports is extremely high in the CR, overriding even the level of EU supports (42 % PSE in the CR compared with 35 % PSE in the EU, as the average 1998 – 2001).
- After entry, more than a 10% decrease in farm-gate prices (compared with the baseline) is predicted. Czech poultry production could be profitable only with a significant lowering of average unit costs (by 17 % at minimum). Moreover, this sector also requires higher investments to fulfil *acquis*.
- Under expected EU conditions Czech poultry production risky, with possible impacts on producers as in the case of pig production.

## Conclusions

Czech agriculture has to finish its transformation and to continue in its restructuring, regardless of EU accession. However, entry should form a driving force and an accelerator for needed changes. It is sure that macroeconomic and other conditions will significantly change relations for input prices. Particularly prices of labour and land should outstandingly increase in the future[8]. With the expectation of only mild growth in farm-gate prices, farms with a mean effectiveness will have to significantly reduce their unit costs or to leave the market. At the same time, a solution to the present dichotomy in farm effectiveness represents considerable potential for the future of Czech agriculture in the EU. Besides this and in spite of the expected marked growth of prices for labour and land, the prices for both factors will not reach the average EU price level in 2004 - 2006[9]. However, a shift from the present labour intensive to a a more capital intensive intensive agriculture need not be accompanied necessarily on many farms by larger investments. Anyway, farm investments will be necessary to comply with *acquis*.

Based on the presented commodity views, it is possible with respect to EU accession to conclude:

- Czech agriculture will preserve for a longer time a higher competitiveness particularly in commodities, which do not require a higher level of labour quality

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[8] *It is expected that labour prices will increase during 2000 – 2006 by 63 % and land prices (rents) by even 50 %, whilst prices of other inputs only by 33 %.*

[9] *Price level of all goods in the CR shall reach in 2006 about 55 % of the EU average price level. Wages in industry in nominal terms shall reach about one third of the wage level in German industry.*

and possibly a higher level of technologies (e.g. cereals, oil seeds) and. *vice versa* (e.g. livestock production).

- Under expected EU conditions especially crop commodities on the arable land will have better opportunities to develop. The GSL categories of cattle will also have good prospects for their development, but with some risks for suckling cows. However, this category constitutes an aspect of multifunctional agriculture in unfavourable regions (it is on about 60 % of the Czech agricultural area). Pig and poultry production seem to seem to be sectors at risk.

- The zero level of supports with unreduced unit costs will lead to serious problems for Czech producers, except for sugar beet and the GSL category of dairy cows. The reduced level of supports will bring sufficient profitability to commodities on arable land, but still jeopardize average pig and poultry producers and the ARL cattle categories. The full level of supports could markedly shift the structure of agricultural production to the benefit of crops on the basic area (cereals, oilseeds, pulses). Czech agriculture would thus be more oriented toward a crop production with the lower value added. With a possible reduction in pig and poultry production, a larger part of feed grains will have to be exported (including exports to EU countries).

- However, natural and climatic conditions on the prevailing part of the Czech agricultural area predestine Czech agriculture to a substantially more intensive managment of public goods in the framework of the European Model of Agriculture.

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# A comparison of agricultural impacts of Hungary's EU accession with that of foreign model calculations

Sándor Mészáros[10]

**Abstract**

The present study was preceded by the development of a Hungarian simulation model (HUSIM) to assess the impacts of EU accession on the country's agriculture. The effects of an assumed Hungarian accession will now be compared with projection results of some foreign models. Three agricultural simulation models i.e. ESIM (Göttingen), GTAP (Copenhagen) and CEASIM (Halle) were used to compare accession impacts. The study covers both the methodology of such comparisons and components of differences in model results. Conclusions drawn for improvement of modeling work are also formulated.

**Key words**

European Union, accession impacts, agriculture, partial equilibrium models, comparative analysis

## Introduction

A Hungarian model (HUSIM) was developed in cooperation with other colleagues for projection of agricultural impacts of EU accession (Mészáros et al., 2000, Mészáros and Udovecz, 2001).

The effects of the East enlargement of the EU were, of course, analysed by authors and institutes from the EU, among others also for Hungary. The goal of both analyses was to assist the decision-making and it is obvious that various interests motivate the decisions in question. Owing to this and due also to informatic and methodological reasons the results obtained and the conclusions drawn by different authors and institutes will differ from each other. **Therefore, an overview of impact assessments is getting timely** and the comparison regarding the future development of impact analyses seems to be promising.

Reviewing of agricultural sector models was the topic of a recent EAAE seminar (Heckelei et al., 2001) where typical comparative studies were presented for modelling the CAP (Salvatici et al., 2001) and for reviewing of agricultural trade models (Tongeren and Meijl 1999).

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The comparison of model projections is however a special task. In the case of world market prognoses the general practice accepted is that data and/or time serieses of the various forecasting institutes (for example, OECD, FAPRI, FAO) are listed in the form of a table or diagram. The comparison of forecasts of impacts of the EU accession is an even more comprehensive task due to several reasons:

- The indirect effects of the EU accession are mainly generated by the **changes in prices and subsidies**;
- The price and production effects often refer to **periods of several years** and are modelled by the various institutes either in an aggregated form (effect during of just one year) or extended in time (as an effect trough several years);
- Most of the authors and institutes prepare forecast of **multiple variants**, that is, in various scenarios where the relating (starting) conditions assumed are different;
- Last but not least in our case the **comparison of conclusions** drawn is also of special significance.

This paper tries to get answers to the following questions. 1. Are there substantial quantity differences among projections of Hungarian agricultural production, consumption and trade as a consequence of EU accession? 2. Are the conclusions differing drawn by different authors from their accession models? 3. What can we learn from this comparison for future modelling exercise of CAP impacts?

## Methods

We could compare the Hungarian model **with three foreign models** and all the three models were prepared in EU Member States. For these models we have applied their abbreviations used by the related literature: the ESIM-model was prepared in Göttingen (Banse and Tangermann, 1998; Tangermann and Banse, 2000), the CEASIM model in Halle (Weber, 2001; Frohberg, 2001) and the GTAP model in Copenhagen (Frandsen and Jensen, 2000). The most important characteristics of the four models are included in Table 1.

Table 1

**Comparison of main characteristics of four selected EU-accession models**

| Characteristics | ESIM model | HUSIM (Hungarian) model | GTAP model | CEASIM (CEEC-ASIM) model |
|---|---|---|---|---|
| Location of development | Göttingen (Germany) | Budapest (Hungary) | Coppenhagen (Denmark) | Halle (Germany) |
| Authors | Tangermann, S., Münch, W. | Mészáros S., Spitálszky M., Udovecz G. | Frandsen, S. E. Jensen, H. G. | Frohberg K., Weber, G. |
| Type of simulation model | Partial equilibrium, dynamic | Partial equilibrium, static | General equilibrium, static | Partial equilibrium, dynamic |
| Geographic coverage | World model (with European dominance) | Country model | World model (with 45 regions) | East-European model (with 10 candidate countries) |
| Product coverage | Agricultural products (27) | Agricultural (32) and food products (28) | Agricultural (12) food products, non-agr. (30) | Agricultural (12) and input products (6) |
| Market regime | Prices (producer, consumer, world market) Subsidies (export, direct) Set aside | Prices (producer, consumer, trade, world market) Subsidies Production quotas Set aside | Taxes and subsidies Tariff equivalents Production quotas Protection (PSE figures) | Prices Subsidies Production quotas Set aside |
| Assumed date of EU-accession | Earlier version: partial acc.: 2002 full accession 2008 Present version: full accession: 2002 | Earlier version: full acc.:2002 Present version: full acc.: 2003 | Earlier version: 2005 Present version: 2010 | Earlier version: 2005 Present version: 2007 |
| Transition periode | Earlier version: 6 years Present version: no | No | No | No |

Economically all the four models are so-called „equilibrium models" that is the equilibrium of the market (demand and supply) is projected regarding to the products and sectors included. Three models of these are of 'partial equilibrium' and do not include the whole economy, but the Danish GTAP model contains it ("general equilibrium" model). Two models are dynamic (ESIM and CEASIM) concerning the factor of time, that is, in prognoses time serieses are prepared but the other two are static and by these forecasts for only a definite date can be made (GTAP and the Hungarian model).

The Hungarian model makes projections only for Hungary while the three other models selected for the comparison cover larger geographical regions: ESIM and GTAP are specifically world models while CEASIM model covers only Central- and East-Europe. The advantage of the world models is particularly the inclusion of the international relationships (world market prices, trade) that is, it provides solution within the model while the country model instead of the above can provide a detailed product specification. The product specification of the Hungarian model (60 products) is more detailed than that of the foreign models even in the case of GTAP model where from the 50 products only 20 represent the agri-food sector. The **assumed date of the EU accession** is also an interesting question. In the earlier version of the ESIM model full EU membership for Hungary was prognosticated only for 2008, however, in the new version for 2002 and this is practically the same as in the Hungarian model. However, in the GTAP and the CEASIM models - which analyse the EU accession not only of Hungary but also of the 7-10 Central-East European countries – the date of the integration was planned in the earlier versions for 2005 and in the latest versions for 2007 or 2010.

## Results and discussion

The comparison covered **four fields of the effects** of accession, that is, effects on production, consumption, trade and budget. Detailed data are required for these comparisons. Therefore, the quantitative comparisons are restricted only to the ESIM model of Göttingen. However, we will compare separately the results of the two important scenarios: the versions without the compensatory payments (which in fact present the effects generated by the closing up of prices) as well as the versions of compensatory payments (which at the same time represent the effects of the implementation of the entire CAP).

By both models a **production growth** as a positive effect of the EU accession were projected. As for the changes of the **production pattern** the two different models indicate similar tendencies in 55% (price effects) and in 33% (in the case of the entire CAP), of the products, respectively. This also means that the positions prognosticated for the effects of the EU accession differ in the case of 45% and 67%, of the products, respectively.

Based on the deviations of the two prognoses expressed in %, there are some commodities where the extents of the deviations are not significant. For example, for total grain there is only a 3% difference (the production increase is 23% instead of 26) by considering only the price effects (in the case of the entire CAP the deviation is 17% and as for the internal structure of the grain production even larger differences will be obtained). The same refers to **dairy products** i.e. the results obtained by the two models are close to each other: the deviation is the smallest at liquid milk (3-4%) and the largest at cheese (14%). There are, however, products, for which the deviation is significant and in absolute

value it reaches the 30-40%, such as sugar, rape, beef and poultry products in both scenarios (See tables 2. and 3.).

By comparing the direction of the changes of food consumption we have obtained that for two third of the products the directions of the changes of consumption prognosticated by the two models are the same. As a consequence of price harmonisation, the two models indicate decreasing consumption such as for sugar, dairy products and beef. A tendency of opposite direction could only be seen at poultry meat where both models indicated a consumption increase after the EU accession.

Concerning the **extent** of deviations in four cases significant deviations between the forecasts of the two models were found, namely for rice, butter, cheese, and beef. The ESIM model forecasts for all the four products a more significant consumption decrease than that obtained by our projection. In spite of this the result of the comparison can be summarised as follows: between the results of the two models **the deviations between the food consumption effects are not so large** than in the case of the production effects prognosticated.

As for the **effects** of **trade** it is characteristic for the results of the **ESIM** model that export increase is forecasted for more than two-third of the products and by analysing only **directions** of the changes this is the case for both scenarios. Thus the export of all the crop products modelled will increase – with the exception of oil seed – while for animal products the export of the beef sector will be larger.

Export growth was prognosticated for 11-12 products also by the **HUSIM model**; therefore, in this respect the results of this model and that of Göttingen correspond. However, the **extent** of the growth – with the exception of sugar and butter –of the Hungarian model is smaller, and for grain it is significantly smaller. Consequently, the extent of the export increases of the two scenarios of the Hungarian model does not differ so much as in the case of the ESIM model.

To sum it up: for almost two-third of the products **both models indicated a positive** and **export increasing effect** of the EU accession. Concerning the **direction** of the changes at about one third of the products there were deviations between the result of the two models; however, by considering the entire CAP deviations could be seen at less products (5) than by taking into account only price effects (in the case of 7 products). In the forecasts of the **extent** of changes there are also large deviations of positive direction (for example, grain) but also of negative direction (for example, products of pigs and poultry for which instead of export decrease a stagnation of the import was prognosticated.)

Table 2

**Comparison of price impacts on production**

| Products | Direction of impacts | | Size of impacts | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | in 1000 tons | | | in percent | | |
| | ESIM | HUSIM | ESIM | HUSIM | difference | ESIM | HUSIM | difference |
| Total grain | + | + | 3388 | 2881 | 507 | 26 | 23 | 3 |
| Of it: wheat | + | 0 | 896 | -1 | 895 | 15 | 0 | 15 |
| Course grain | + | + | 2492 | 2881 | 389 | 34 | 36 | 2 |
| Of it: barley | + | + | 924 | 230 | 694 | 58 | 15 | 43 |
| corn | + | + | 1404 | 2593 | 1189 | 26 | 43 | 17 |
| Other grain | + | + | 163 | 58 | 105 | 49 | 19 | 30 |
| Rice | + | 0 | 22 | 0 | 22 | 132 | -5 | 137 |
| Sugar | + | + | 167 | 15 | 152 | 32 | 4 | 36 |
| Rape | - | + | -25 | 21 | 46 | -29 | 8 | 37 |
| Sunflower | - | + | -298 | 63 | 361 | -28 | 7 | 35 |
| Milk | + | 0 | 202 | 0 | 202 | 9 | 0 | 9 |
| Of it: fluid milk | - | - | -8 | -8 | 0 | -5 | -1 | 4 |
| butter | + | 0 | 1 | 0 | 1 | 7 | 0 | 7 |
| cheese | + | + | 8 | 1 | 7 | 15 | 1 | 14 |
| Beef | + | - | 22 | -4 | 26 | 25 | -5 | 30 |
| Pork | - | + | -80 | 5 | 85 | -20 | 1 | 19 |
| Poultry | - | - | -106 | -2 | 104 | -29 | -0.4 | 28.6 |
| Eggs | - | - | -67 | -12 | 55 | -29 | -0.4 | 28.6 |

Table 3

**Components of differences of production impacts**

| Products | Percentage change of production | | | Percentage change of real price | | Own price elasticity | | Product of price change and price elasticity | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ESIM | HUSIM | difference | ESIM | HUSIM | ESIM | HUSIM | ESIM | HUSIM | difference |
| Wheat | 15 | 0 | 15 | 56 | 22 | 0.646 | 0.595 | 36 | 13 | 23 |
| Barley | 58 | 15 | 43 | 116 | 29 | 0.662 | 0.595 | 77 | 17 | 60 |
| Corn | 26 | 43 | 17 | 59 | 60 | 0.598 | 0.627 | 35 | 38 | 3 |
| Sugar | 32 | 4 | 28 | 53 | -6 | 0.552 | 0.247 | 29 | -1 | 30 |
| Sunflower | -28 | 7 | 35 | 0,8 | 15 | 0.992 | 0.498 | 1 | 7.5 | 6.5 |
| Beef | 25 | -5 | 30 | 101 | 4 | 0.376 | 0.429 | 38 | 2 | 36 |
| Pork | -20 | 1 | 21 | 9 | 4 | 0.949 | 0.406 | 9 | 1.6 | 7.4 |
| Poultry | -29 | -0.4 | 28.6 | -12 | 4 | 1.037 | 0.406 | -12 | 1.6 | 10.4 |
| Eggs | -29 | -0.4 | 28.6 | 2 | -3 | 1.197 | 0.111 | 2 | -0.3 | 1.7 |

The **comparisons** of conclusions drawn from the prognoses prepared by the various research institutes might also be useful. If the conclusions coincide with each other or are similar then their probability is strengthened. If the conclusions (as for tendencies and magnitude) deviate then it might be reasonable to analyse the reasons and motivations. If our foreign colleagues find phenomena and factors, which we did not analyse, then it is well worth taking them into consideration in our future analyses.

As for **agricultural prices** the conclusions of the four models are congruent, that is, the level will increase as a result of the EU accession and this will be positive for the Hungarian producers of agriculture. However, to this statement we have to add two restrictions. The first is that there are sectors where integration will result a price reduction. These are the pig and poultry sectors with high fodder requirement. In this respect the results of the Hungarian model harmonises well with those of the ESIM and CEASIM models. The second restriction is that by proceeding in time the rate of the price rise (the so called price gap) to be expected is decreasing.

Regarding **direct payments** it is remarkable that none of the three foreign research institutes refused to extend the subsidies to the CEECs (contrary to an earlier EU-position). The result obtained by the Hungarian model – indicating that due to the EU accession the income of agricultural producers would increase by 40% instead of 15% demonstrates the significance of these subsidies. Our colleagues (Tangermann and Swinnen, 2000) think that the extension of the compensatory payment to the Central-East-European countries would also have an effect of **macro-economic significance** (provided these would be granted at the same level as in the 15 EU members states). The conclusions drawn by the Danish researchers (Frandsen and Jensen, 2000) emphasise that the extension of compensatory payments and premium into "east" would encourage exceeding the base areas and the livestock numbers. This consideration led them to formulate a recommendation – which we think is interesting – that compared to the present level **2/3 of the direct payments** should be granted on the **whole area of the enlarged Union**.

As for the **production effects** of the Union the congruent and general conclusion of the four models is that the accession will have a positive effect: production will grow of at least some products, however, two important factors, direct subsidies and the quotas will influence the extent of that increase.

As for implications of the accession on the **(net) exports** the conclusions of the four institutes harmonise regarding that the export of Hungary and the CEEC (that is their share in the consumption of the EU 15) will increase. The concusions of the German institute (Münch, 2000) state also that one part of export surpluses will derive from the consumption decrease and from the fact that the rate of consumption increase is lower than that of production (the results of the Hungarian model show the same).

Concerning the **budgetary effect** of the enlargement of the EU to the East the earlier estimations largely fluctuated between billion ECU 4 and 44 (Rabinowitz 2000). The magnitude of the budgetary effects prognosticated by these institutes decreased significantly. The EU-budget increase generated by the accession of the five CEEC calculated by ESIM model is about ECU 7 billion. The amount calculated by the colleagues in Halle is similar (EUR 7.8 billion) by only granting export subsidies and direct payments but calculated for 10 candidate countries.

The estimations of the researchers in Copenhagen are almost double of it (EUR 16 billion for the 7 CEEC) and would increase the net expediture of the CAP by 34%. Therefore, the EUR 1.5 billion expenditure surplus obtained by the Hungarian model (by including also the direct payments and the subsidies), is rather in harmony with the estimations of the German institutes and amounts to about 20% of those. This way it corresponds to the share calculated earlier by the European Commission for Hungary (see Münch 2000).

## Conclusions

The conclusions drawn for **further Hungarian impact studies** and **researches** on agricultural economics can be summarised as follows:

- The most important generating factors effecting the production, consumption and external trade of the integration are **the producer price changes** to be taken place after the EU accession (in addition to the modifications of the subsidy schemes). Therefore, the comparison of the EU prices with the Hungarian prices - with special regard to the quality of the goods - will remain also in the future an important research task. In addition the **time requirements of the price transmissions** are to be investigated separately based on the experience of the earlier accessions.
- Regarding the magnitude of effects of the accession to be expected (considering the prices and subsidy changes) it is also important how strong or weak are the price reactions of the producers and consumers. Therefore, in the future it would be justified to make **international comparisons** on the **price elasticities** of agricultural supply and demand.
- On the enlarged Single European Market the **competitiveness** of the Hungarian products and producers will become more and more important by taking also the domestic market into consideration. In the Hungarian accession model this could not be projected perfectly, on one hand, due to lacking a proper method and, on the other hand, because for measuring competitiveness by world market prices instead of the prices of our competitor countries. It would be important to investigate (continuously) this problem in the form of a **separate research subject.**
- The conclusion of the Danish colleagues (Fransen and Jensen, 2000) i.e., the price increasing effect of the EU accession will be capitalised in the **land prices**, is interesting and although the Hungarian agricultural producers expect the same, in our accession model we could not take this indirect effect into account. It would, however, be worthwhile to do also research on the factors of changes of land prices as a function of time.
- Similarly, the question of impact assessment of **investments** might also arise, in particular, of foreign investments to be expected after the EU accession. This effect will probably be larger in the other Central–East European candidate countries than in Hungary as here a significant part of foreign investments have already been made, first of all, in food industry. However, in the future it might become timely to analyse what are the changes to be expected in the fields of agricultural investment after Hungary's EU accession.

## Acknowledgement

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# Incomes of agricultural holdings in the European Union and Hungary

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## Abstract

This study analyses the recent developments of Hungarian agricultural income in comparison to those of present EU Member States and discusses what to expect after EU accession. The comparison of past income was based on the data of the Hungarian resp. EU Farm Accountancy Data Network while in the forecasts for the period after EU accession AKII models were applied. The results achieved during the EU-harmonisation process by the Hungarian FADN made it possible to compare the agricultural holdings in the Member States and Hungary in a unified system by using identical variables. Among other things, the comparison shows that the net income per hectare of agricultural area is only one third that of the EU-average. This difference is due to several factors:low input efficiency, low level of subsidies, unfavourable farm structure, poor machinery, etc. The price mechanism of the markets - changes in product and input prices, plus the changing role of certain cost types - will probably only slightly change expected income after EU accession. The income generating capacity of agriculture will remain subsidy-dependent. The authors state that if the producers react appropriately to the changes and if direct payments from the EU budget are supplemented from the national budget then entrepreneurial income might increase by 7-9 percent in 2004 compared to 2001. The increase might be even larger if further subsidies granted under national authority are also be made available. In the sectors not covered by CAP subsidies (pork and poultry and most fruit and vegetable production) profitability increase can only be ensured by considerably increasing competitiveness and by restructuring, which has been delayed for a long time.

### Key words

Income of agricultural holdings, input and output prices, comparison of the income variables, FADN, EU accession, effects of CAP to be expected, competitiveness

One year before accession to the European Union we have finally got to face the facts of the present Hungarian agricultural system and the opportunities to be expected from competition. On one hand, the Farm Accountancy Data Network (FADN) can be considered a suitable information base as it focuses on **income**. On the other hand, when Hungary becomes an EU Member State, FADN as a European database will provide a basis by which the implications, the impacts, and the crucial points of the Common Agricultural Policy can be identified. Profitability and the size of attainable income will obviously have significant roles. These variables present the efficiency of the past periods and also the future opportunities due to competition.!

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## 1. The basis for comparison: the Farm Accountancy Data Network (FADN)

In 1965 the European Commission established a representative information system **for the determination of incomes and business analysis of agricultural holdings** in order to provide assistance to the *Common Agricultural Policy*. This system is called the Farm Accountancy Data Network (FADN). The Member States are obliged to cooperate in the establishment of this unified database for Brussels.

In 1995 the Hungarian Ministry of Agriculture assigned the Research and Information Institute of Agricultural Economics (AKII) to establish an EU-conforming FADN in Hungary. Later the establishment of the system was also enacted by Act No. CXIV of 1997 on the Development of Agriculture, thus providing a legal framework for the system. The network of data suppliers was developed gradually and by 2001 about 2000 holdings across the entire country were covered in the survey. The Hungarian name for the system is similar to the German, „Das Testbetriebssystem". Based on the requirements of the European Union, only large-scale, commercial holdings producing for sale are observed. The 2000 holdings of the sample represent approximately 91000 agricultural holdings.

## 2. Relationships between farm structure and income variables
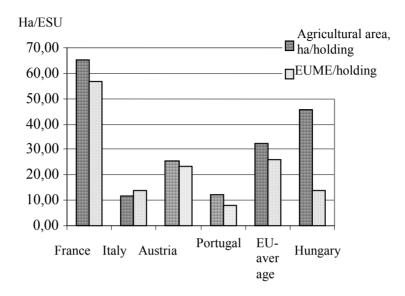
### 2.1. Characteristics of farm structure

At present as a result of the EU harmonisation process and the Hungarian Farm Accountancy Data Network, it is possible to compare *the Hungarian and EU agricultural holdings in a unified system with the help of identical indicators.* The Hungarian data are, on the one hand, compared to the EU averages and, on the other hand, to the data of France, Italy, Austria and Portugal - the production structures of these countries are the most similar to Hungary's.

The Hungarian data refer to 2001 while those of the EU Member States to 2000.

The agricultural area of the observed Hungarian holdings is 45.4 hectares on average compared to the EU average of 32.4 hectares. From among the countries analysed the French holdings are the largest in size. In France the average area is 65 hectares, which is more than double the EU average and almost one and a half the Hungarian average. The average agricultural area of the Austrian holdings is 25.5 hectares and it is 20 percent smaller than the EU average, while both in Italy and in Portugal the average size of a holding is about 12 hectares (Figure 1).

Figure 1
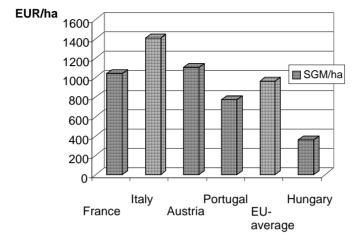
**Characteristics of the average size of the holdings**



*The economic size of Hungarian holdings (13.7 ESU) is only half of the EU average (26.0 ESU).* In fact the Hungarian data are exactly the same as those of Italy and almost double Portugal's. However, in the above two EU Member States, the average area (and presumably the same refers to other resources too) is significantly smaller than in Hungary.

The relationship between the size of a holding defined by agricultural area or by SGM depends on the average country's SGM per hectare. The latter is mostly influenced by profitability of production and the structure of farming (land use intensity, livestock density and livestock structure). **In Hungary,** due to the low level and low intensity of profitability, the above **variables are less than 40 percent of the EU average (Figure 2)**.

Figure 2

**SGM per hectare of agricultural area**



*In the European Union* the specialisation of holdings is significant: almost 80 percent of the holdings are specialized producing one or a group of products (two thirds of their total SGM are generated by one product), and only 20 percent of the holdings are mixed holdings (Figure 1). *On the contrary, in Hungary only 64 percent are specialized holdings.*

Table 1

**Distribution of holdings by type of farming (percentage)**

| Type of farming | | France | Italy | Austria | Portugal | EU average | Hungary |
|---|---|---|---|---|---|---|---|
| Specialist | Field crops | 24.1 | 30.7 | 12.8 | 12.5 | 23.8 | 35.1 |
| | Horticulture | 2.8 | 3.1 | - | 3.4 | 3.5 | 4.2 |
| | Permanent crops | 15.3 | 39.2 | 8.0 | 28.1 | 28.6 | 7.7 |
| | Grazing livestock | 37.8 | 7.9 | 49.1 | 13.0 | 23.3 | 8.9 |
| | Granivore | 1.6 | 0.4 | 6.2 | 0.7 | 1.5 | 8.1 |
| Mixed holdings | Crops[1] | 3.9 | 13.1 | 4.8 | 22.4 | 9.5 | 12.3 |
| | Livestock[2] | 3.2 | 1.1 | 7.0 | 8.3 | 2.3 | 10.1 |
| | Crops-livestock | 11.5 | 4.7 | 12.2 | 11.7 | 7.5 | 13.7 |
| Total | | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Personal calculations based on the FADN Public Database (http://europa.eu.int/comm/agriculture/rica), and the Hungarian Farm Accountancy Database

[1] The various combinations of field crops, vegetable and flower production as well as vine and fruit production are the most important.

[2] In these various mixed holdings grazing livestock and granivores are dominant.

As for farm structure in the Union (by referring only to the observed holdings and over the size classes) the most common ones are *specialized permanent crops* (vine, fruit, citrus fruit and olives) (with a share of 28.6 percent). Then *specialized field crops* (23.8 percent) and *specialized cattle breeding and sheep breeding* holdings follow (23.3 percent). Observations in Hungary, selected from the 91000 holdings above 2 ESU, the share of specialized field crop holdings is significant (35.1 percent). This group is followed by *mixed holdings of crops and livestock* (13.7 percent) as well as by *mixed crop holdings* (12.3 percent).

Tables 2 and 3 show the distribution of holdings and the SGM production by economic size categories. We can see three countries with diverse farm structures, these are: Portugal, Italy and Hungary. Among these *Hungary* is obviously the most *specific one*: the majority of the holdings (more than 80 percent) are included in the two smallest size categories, however, their economic importance is only slight (with 12 percent SGM). In the middle size category both the number of holdings and the economic importance are small. At the other end, we can see that large size categories are only 2 percent of the holdings and produce 53 percent of the total SGM.

Table 2

**Distribution of holdings by size classes (percent)**

| Size class | France | Italy | Austria | Portugal | EU average | Hungary |
|---|---|---|---|---|---|---|
| 0 - <4 ESU | - | 32.2 | - | 64.02 | 23.6 | 55.1 |
| 4 - <8 ESU | - | 28.0 | - | 18.91 | 19.6 | 25.9 |
| 8 - <16 ESU | 15.6 | 19.0 | 44.1 | 9.73 | 19.4 | 10.8 |
| 16 - <40 ESU | 43.3 | 14.3 | 44.8 | 5.34 | 21.2 | 4.7 |
| 40 - <100 ESU | 32.8 | 5.3 | 10.9 | 1.64 | 12.5 | 1.7 |
| >= 100 ESU | 8.3 | 1.3 | 0.3 | 0.36 | 3.8 | 1.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Personal calculations based on the FADN Public Database (http://europa.eu.int/comm/agriculture/rica), and the Hungarian Farm Accountancy Database

Table 3

**Distribution of SGM by size classes (percent)**

| Size class | France | Italy | Austria | Portugal | EU average | Hungary |
|---|---|---|---|---|---|---|
| 0 - <4 ESU | - | 7.46 | - | 24,77 | 3,01 | 11,3 |
| 4 - <8 ESU | - | 11.75 | - | 16,04 | 4,67 | 0,6 |
| 8 - <16 ESU | 4.18 | 15.67 | 22.54 | 16,21 | 9,31 | 8,8 |
| 16 - <40 ESU | 25.68 | 26.05 | 50.22 | 19,39 | 23,16 | 8,5 |
| 40 - <100 ESU | 42.80 | 22.69 | 25.76 | 13,84 | 31,62 | 7,5 |
| >= 100 ESU | 27.34 | 16.38 | 1.48 | 9,74 | 28,22 | 53,4 |
| Total | 100.00 | 100.00 | 100,00 | 100,00 | 100,00 | 100,0 |

Source: Personal calculations based on the FADN Public Database (http://europa.eu.int/comm/agriculture/rica), and the Hungarian Farm Accountancy Database

## 2.2. Income development

In Hungary the *total output* per hectare is two-thirds of the EU average, but it is 15 percent larger than in Portugal (Table 4). However, the *intermediate consumption per hectare* - in spite of economic "constraints" - is approaching the EU norm. It exceeds 90 percent of the Community average and exceeds by more than 70 percent the data of Portuguese holdings. As for the EU average, the output per EUR intermediate consumption is 1.85 EUR while in Hungary it is only 1.35 EUR. This is due both to trade factors and the low efficiency of inputs.

Table 4

### Derivation of the data

| Variables | France | Italy | Austria | Portugal | EU average | Hungary |
|---|---|---|---|---|---|---|
| Total output, EUR/ha | 1730.2 | 2388.8 | 2134.2 | 926.1 | 1571.5 | 1062.7 |
| - Intermediate consumption, EUR/ha | 1002.9 | 997.0 | 1071.1 | 461.0 | 850.7 | 787.4 |
| - Depreciation, EUR/ha | 278.3 | 375.7 | 495.6 | 159.3 | 229.5 | 69.6 |
| + Balance current subsidies and taxes, EUR/ha | 267.4 | 340.1 | 615.3 | 154.3 | 274.9 | 45.9 |
| = Net value added, EUR/ha | 716.4 | 1356.2 | 1182.8 | 460.1 | 766.3 | 251.6 |
| - Total external factors[1], EUR/ha | 305.7 | 221.3 | 166.9 | 114.7 | 245.9 | 197.8 |
| of which wages paid, EUR/ha | 121.2 | 149.9 | 46.0 | 86.0 | 120.1 | 139.4 |
| + Balance current subsidies and taxes on investments, EUR/ha | 15.5 | 8.9 | -46.2 | 33.5 | 5.9 | 8.6 |
| = Farm income[2], EUR/ha | 426.3 | 1143.8 | 969.7 | 378.9 | 526.3 | 62.4 |
| Gross farm income[3], EUR/ha | 547.4 | 1293.8 | 1015.7 | 464.9 | 646.5 | 201.8 |

Source: Personal calculations based on the FADN Public Database (http://europa.eu.int/comm/agriculture/rica), and the Hungarian Farm Accountancy Database

[1] Inputs, which are not the property of the holder, such as: wages and social security, rental fee for land and buildings and interests paid.

[2] The payments for family factors, that is, costs imputed for work, land and capital in family property are not considered, therefore, the variable can only be applied with reservations for the comparisons of family farms with associations or for joint analyses

[3] In order to correct partly the „errors" of the previous variable the costs of wages and social security are not deducted (in the EU-FADN this variable is not applied).

By deducting from the total output the intermediate consumption and depreciation (in Hungary its value per hectare is only 30 percent that of the EU average) as well as the balance of current subsidies and taxes we obtain the *net added value*. **In Hungary it is 252 EUR/ha compared to the EU average of 766 EUR/ha.**

The **differences** in the net value added are due not in the least to the **extent of subsidies reduced by taxes.** In Hungary the latter accounts for only for 17 percent of the EU

average. If the net subsidies for production had achieved the EU average then the net added value would have exceeded the value of Portugal.

Due to the differences in ownership and labour legislation the farm income variables cannot be applied by comparing Hungary with EU Member States. This is also shown by the variable indicating a larger gap in performance than really exists. The EU average is almost 8 times more than the Hungarian value. The total output per hectare, reflects the real situation better, meaning the EU average is "only" about 3 times larger.

Income variables by agricultural area unit provide an important opportunity for comparisons, however, they do not present a general overview or entrepreneurial incomes. In order to form a correct judgement it is reasonable to also analyse the efficiency of other resources (Table 5). By analysing the income development as a function of total fixed assets or total assets the picture obtained is especially favourable for Hungary. In Hungary the value of total assts per hectare is only a small fraction of the average of the Union. This is due to relatively low Hungarian land prices and to the fact that the rate of land leasing is higher than the EU average (the rental price is not registered). However, the significant gap in performance in Hungarian building values, breeding livestock, machinery and circulating capital show that **Hungarian farmers are poorly equipped and their machinery is obsolete and worn-out.** No doubt *the total income per assets unit is the highest in Hungary compared to the EU average or to the Member States analysed.* As for the income per Annual Work Unit (AWU) the conclusions drawn are the same as by analysing by area, i.e., the Hungarian values exceed only slightly one third of the EU average!

Table 5

**Data relating to the profitability of assets and labour input**

| Variable | France | Italy | Austria | Portugal | EU average | Hungary |
|---|---|---|---|---|---|---|
| Total assets, EUR/ha | 4174.0 | 24305.2 | 11183.1 | 4042.0 | 8354.0 | 1189.9 |
| of which: Land and permanent crops, EUR/ha | 787.7 | 18486.5 | 2821.1 | 2266.8 | 4853.5 | 203.2 |
| Buildings, EUR/ha | 613.0 | 2301.3 | 4898.0 | 479.4 | 1033.2 | 250.5 |
| Machinery, EUR/ha | 726.6 | 1698.4 | 1872.6 | 607.7 | 759.9 | 283.6 |
| Breeding livestock, EUR/ha | 424.5 | 354.5 | 278.7 | 172.5 | 341.1 | 92.7 |
| Circulating capital, EUR/ha | 1622.3 | 1464.5 | 1312.8 | 515.6 | 1366.4 | 359.97 |
| Paid labour input, AWU/100 ha | 2.8 | 9.4 | 7.2 | 10.3 | 4.3 | 4.3 |
| Gross farm income, EUR/100 EUR total assets | 13.1 | 5.3 | 9.1 | 11.5 | 7.7 | 17.0 |
| Gross farm income, EUR/AWU | 19610.4 | 13760.9 | 14076.1 | 4500.0 | 15177.5 | 4679.7 |

Source: Own calculations based on the FADN Public Database (http://europa.eu.int/comm/agriculture/rica), and the Hungarian Farm Accountancy Database

In general, coupled with the increasing size of holdings, farming efficiency is also improving. This can be explained by the fact that larger sized farms provide opportunities for

full-scale employment, better capacity utilisation, specific savings on additional investments, etc. As for the output and income by area unit, these effects do not necessarily appear since in small holdings very intensive cultivation is possible and the variables per labour or assets units will certainly improve.

The data categorised by size classes confirm the economies of scale. The variables of the EU Member States - by neglecting the slight fluctuations - show that the larger size categories are more profitable (Annex 1 and Figure 3). This also holds true in Hungary, however, the differences are significantly smaller. It is striking that *the large Hungarian holdings are not yet able to generate such a significant improvement in labour efficiency as holdings of same size as in the Union* (where the total farm income of the two mammoth size categories is almost ten times larger, while in Hungary the difference is less then double).

Figure 3

**Total farm income per hectare by size classes**



Due to the different characteristics of various types of farming (branches) it is difficult to compare the efficiency of the main production factor, meaning land use in holdings of various types of farming. The advantage of specialized holdings, such as specialized vegetable, vineyards and fruit as well as specialized pork and poultry with purchased fodder (and in this way even on an minimum area) are obvious (Annex 2).

Considering all EU Member States, the income variable of total input per assets unit is the most advantageous in the specialized vegetable holdings, while, regarding labour efficiency, specialized granivores are at the forefront. Therefore, we can state that *in the Union the direct compensatory payments do not essentially determine the competitiveness of the various types of farming*. The two most subsidised categories (field crops, grazing livestock) are of medium labour efficiency but are the last ones in terms of assets efficiencies.

Through analysing the Hungarian situation, one can draw the same conclusions: analysis of every income variable indicates specialist vegetable holdings are in the forefront; in 2001 specialized granivores were also in a relatively favourable situation. The least

favourable position was held by specialized cattle and sheep, as well as specialized permanent crops.

## 3. Changing incomes after EU accession

After EU accession external trade, meaning competitiveness, will basically determine the return of invested capital and the profitability of current inputs in agriculture. This is an exciting prospect as significant changes can be expected in these fields. The improving situation of input and output prices will continue and the fluctuation of prices will slow due to institutional pricing and the intervention system; support schemes will radically be modified and competition in the various markets will obviously strengthen. Improvement in income and self-financing ability will depend on the synthesis of all the above factors, meaning the successful adaptation of production.

### 3.1. Incomes probably to be generated by prices

According to the paper by Mária Nagy Orbánné "Agricultural production prices in the European Union and Hungary grew significantly closer during the nineties, particularly in the second half of the decade."

The differentiated approach of production prices - in general between 25-30 percent - was due, on the one hand, to the price drop in the Union and, on the other, to the Hungarian price rise. The price-rates in 2000 have already provoked hopes and concerns among Hungarian producers regarding expected price competitiveness. Hungary's price advantage disappeared long before EU accession (2000!), moreover, at present some products are in a disadvantageous position in terms of prices. In 2000 Hungary's significant advantage (low price) could be seen in the fields of slaughter cattle, sugar beet and most vegetables and fruits. However, concerning annual averages Hungary had a minimal price advantage in slaughter pigs, slaughter chickens, roast lamb, potatoes, eggs and sunflower. At the end of the nineties Hungarian prices for these products - at a specific time of the year - exceeded those of the market leaders. The producer prices of other products were floating around (rather below than above) the EU-15 averages.

This rather rapid price adjustment (due to the pressure of costs) did not stop after 2000 and it will probably continue until EU accession and even afterwards. Based on the projections of some large institutions (FAPRI, OECD, EU, FAO) and on Hungarian estimatimates at the time of EU accession, Hungary will only have definite advantage in vegetables, fruit, slaughter cattle, maize and sugar beet production.

Table 6

**Production prices to be expected in Hungary before EU accession (2003) and in the EU (EUR/100 kg)**

| Products | Hungarian Price | EU 15 Weighted Price | Hungarian/EU Price, (percentage) |
|---|---|---|---|
| | **2003** | **2003** | **2003** |
| Slaughter cattle | 84 | 105 | 80 |
| Slaughter pig | 105 | 105 | 100 |
| Slaughter poultry | 72 | 75 | 96 |
| Roast | 200 | 200 | 100 |
| Cow milk. 3.6 percent | 27.2 | 29.0 | 94 |
| Egg | 5.2 | 5.8 | 90 |
| Wheat | 10.5 | 11.2 | 94 |
| Barley | 10.2 | 11.0 | 93 |
| Maize | 930 | 11.8 | 76 |
| Rice | 29 | 28.6 | 101 |
| Potato | 12 | 13 | 92 |
| Sugar beet. tons | 25 | 41 | 61 |
| Sunflower seed | 19 | 19.5 | 97 |
| Onion | 1405 | 23.0 | 63 |
| Tomato | 37 | 62 | 60 |
| Cucumber | 43 | 43 | 100 |
| Apple | 23 | 35 | 66 |
| Pear | 19 | 45 | 42 |

Source: Mária Nagy Orbánné: Producer and Retail Prices in the Hungarian Food Industry in Comparison to the EU Prices. AKII, 2002. No. 1

In theory, and this might partially prove true, additional incomes might be generated by increasing market prices - in spite of the rapidly closing gap in prices - straight away after EU accession. However, it has also to be taken into account that the additional costs, resulting from EU accession, will account for the significant part of the output price increase. Unfortunately, such trade conditions also exist in the EU. At the time of Hungary's EU accession (and also afterwards) all input prices - with the exception of fuel - will increase. The prices of feed, fertilisers, spare parts, animal pharmaceutical products etc. will increase, meaning the "actual prices" will generate only limited additional income for hopeful producers. However, in addition to all these, new and old factors will prove even more significant. . In particular, labour cost, the price of land and land lease, the cost of market access and investment required for meeting EU standards in environmental and animal welfare. In a nutshell, **market price mechanisms connected to EU accession mean the present income deficit would decrease only to a small extent.**

## 3.2. The probable effects of subsidies on incomes

Like in the EU, Hungarian governmental subsidies not only assist in reaching some definite objectives but actually aim at increasing agricultural incomes to the level of the other

sectors of the national economy, but with little success. At present, if subsidy-free market conditions prevailed both in the EU and in Hungary, a great number of holdings would become bankrupt Therefore, it can be stated that in agriculture, particularly in its major branches, self-financing cannot be a realistic goal. Both profitability and income generating capacity **depend significantly on government subsidies**. In Hungary share producer subsidies were always low compared to its competitors and during the first years after the country's political and economic transition it decreased drastically. After seeing the consequences the nominal amount of subsidies was increased, but due to trade conditions and decreasing efficiency, this was not enough to proportionally increase entrepreneurial and personal incomes, or to decrease the income gap.

Development of agricultural subsidies (billion HUF):

| | |
|---|---|
| - averages of 1994-1997 | 81.9 |
| - 1998 | 110.6 |
| - 1999 | 137.1 |
| - 2000 | 137.6 |
| - 2001 | 191.8 |
| - 2002 (to be expected) | 210.5 |
| - 2003 (planned) | 234.9 |

It seems certain that subsidies available in 2002 and 2003 will not spark a surge in income. The principal problem is that, other than managing present difficulties, conditions for improving long-term competitiveness are not provided. Therefore, the future income gap is almost predictable unless EU accession and modification of subsidy schemes lead to radical change!? But will this really happen? Based on our present information prospects after 2005 are more promising, but in the first years after accession - particularly in 2004 - a great deal of uncertainty is on the horizon.

Table 7

**Subsidies to be granted between 2004-2005**

billion HUF

| Denomination | In 2004 | | | In 2005 | | |
|---|---|---|---|---|---|---|
| | EU | Supplements from national budget | Total | EU | Supplements from national budget | Total |
| 1. Market measures | 25 | - | 25 | 25 | - | 25 |
| 2. Direct payments | 70 | 85 | 155 | 85 | 85 | 170 |
| of which: | | | | | | |
| Crops | 65 | 79 | 144 | 78 | 78 | 156 |
| Livestock | 5 | 6 | 11 | 7 | 7 | 14 |
| 3. Rural development[1] | 60 | 16 | 76 | 67 | 19 | 86 |
| of which: | | | | | | |
| Accompanying measures | 40 | 6 | 46 | 43 | 7 | 50 |
| Structural Funds | 20 | 10 | 30 | 24 | 12 | 36 |
| 4. Total | 155 | 101 | 256 | 177 | 104 | 281 |
| 5. National subsidies | - | - | - | - | - | - |
| 6. Grand total | 155 | - | - | 177 | - | - |

Source: own calculation

[1] The share of subsidies granted in fact account for 40-60 percent of the budget available.

Based on the current Act on Agriculture, and depending on economic growth and inflation, in 2004 260 billion HUF shall have to be made available for agriculture. Thanks to EU normative market regulation, direct payments and regional development, as well as supplements from national budgets agreed on during accession negotiations, this amount will most probably be made available. Quite simply, because of subsidies this means that the producers' situation would be similar if Hungary did not join the EU! Consequently, incomes will probably also be similar, which means quality improvement cannot be expected! However, in two aspects there might be significant differences. On the one hand, the 260 billion HUF in subsidies can be increased by supplements from the national budget and this would most probably increase agricultural income compared to the pre-accession period. On the other hand, the subsidy structure will radically be modified as well as the spending procedure. The share of product subsidies (sectors) will increase. However, subsidies will mainly focus on cereal, oil and on the protein plant branches as well as on beef-cattle. One consequence can easily be foreseen: the income and the self-financing capacity of the above already prosperous specialized holdings would probably improve! The other positive consequence can also be expected, meaning modification of subsidy structure, strict control of subsidy utilisation, also generating additional income and this **would have a positive impact on agriculture.**

As for the future income of the branches which are at present struggling with efficiency problems and which are subsidised in Hungary, but not in the EU (e.g., pig and poultry); there remain inherent risks and uncertainties. From 2005 the income position of the entire agricultural sector - from the point of view of subsidies - will further improve but this will not contribute to the improvement of income in these branches.

## 3.3. Total income of agricultural production

The extent of agricultural income represented by total agricultural output or rather its deviation can be estimated by using the unified EU system of Economic Accounts of Agriculture (EAA).

We based our 2004 forecast on the final EAA data of the Central Statistical Office. For the calculations we used HUSIM and OPAL models initiated by the Research and Information Institute of Agricultural Economics.

Based on the results obtained by the model it can be projected that if

the market players reacted appropriately to the changes but Hungary were still forced to compete with the old Member States without supplements from the national budget, then, due to the necessary selection among the branches in a critical position, **gross and net value added would decrease by 3-4 percent and net farm incomes would drop by 15 percent**.

The outlook would be different if we took into account promised supplements from the national budget which are to be granted directly to the various branches of agriculture. Then it would be almost certain that - by changing the share of branch -specific and non-branch specific subsidies both the value added and the entrepreneurial incomes would be favourably modified:

The moderate price increase, the increase in efficiency and the national contribution of direct payments of 85 billion HUF revealed in EAA calculations that **in 2004 both the gross and net value added as well as entrepreneurial incomes** (in private holdings including also wages) **would increase by 7-9 percent** compared to 2001! Moreover, this augmentation could be enhanced if, in addition to the community and supplements from the national budget, **new objectives to be financed by national authorities were included.**

It has to be noted, however, that this is a theoretical option and income generated modifying the structure of subsidies in the EAA is derived by taking into account the increase of product subsidies regarding subsidies granted for other objectives but not considered in the EAA model. In fact income increase would only be generated if the former (Hungarian) subsidy scheme were superfluous and the money would not be missed if it were eliminated!? Otherwise the improvement is only superficial, a **methodological game,** as the income would increase in one pocket but decrease in another.

Concerning agricultural incomes one of the **summarising** statements is: in the largest branch of Hungarian agriculture, meaning COPF (cereal, oil, protein and fibrous plants) profitability will increase in 2004 and later further increase and thus the foundation for self-financing will strengthen. However, in the branches outside CAP subsidies (pork, poultry, and most branches of fruit and vegetable farming) strengthening of competition within the Common European Market will only come with various opportunities and risks.

The future of these branches and of course its income generating capacity depend, on the one hand, on external factors (potential of the Hungarian budget), and, on the other hand, on the competitiveness of individual holdings and associations. In order to significantly improve competitiveness, investments in the fields of market access and efficiency as well as co-operation among competent producer organisations are required. It is undeniable that in the latter branches of Hungarian agricultural, profitability increase assumes a long-delayed **restructuration** process. In other words, the least organised and the least efficient holdings

will have to abandon their present activities and will have to surrender their markets and production factors to the more profitable ones. If restructuring is well-organised and introduced as early as in 2004-2005 **then it might lead to additional income!**; the income of CAP-supported branches exposed to tough competition will exceed that of the pre-accession period.

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## Data of the FADN holdings by size classes

| Size Classes/Variables Country | 0 - <4 ESU | 4 - <8 ESU | 8 - <16 ESU | 16 - <40 ESU | 40 - <100 ESU | >= 100 ESU |
|---|---|---|---|---|---|---|
| **France** | | | | | | |
| - Total output. EUR/ha | - | - | 1223.9 | 1433.9 | 1702.9 | 2199.6 |
| - Net value added. EUR/ha | - | - | 521.5 | 588.7 | 681.2 | 958.8 |
| - Gross farm income. EUR/ha | - | - | 469.4 | 476.5 | 507.0 | 715.9 |
| - Gross farm income. EUR/100 EUR total assets | - | - | 11.8 | 11.5 | 12.5 | 16.1 |
| - Gross farm income.. EUR/AWU | - | - | 9571.1 | 14295.8 | 21030.7 | 28045.2 |
| **Italy** | | | | | | |
| - Total output. EUR/ha | 1776.0 | 1946.2 | 1838.2 | 2368.2 | 2941.1 | 3744.1 |
| - Net value added. EUR/ha | 982.9 | 1045.0 | 1047.6 | 1251.5 | 1567.3 | 2592.0 |
| - Gross farm income. EUR/ha | 939.3 | 1020.3 | 1009.4 | 1193.3 | 1473.6 | 2452.4 |
| - Gross farm income. EUR/100 EUR total assets | 3.7 | 4.0 | 4.8 | 5.4 | 6.0 | 8.0 |
| - Gross farm income.. EUR/AWU | 5479.2 | 7240.9 | 10883.5 | 16369.9 | 25886.9 | 53555.8 |
| **Austria** | | | | | | |
| - Total output. EUR/ha | - | - | 2121.2 | 2109.6 | 2223.2 | 1653.4 |
| - Net value added. EUR/ha | - | - | 1192.0 | 1183.5 | 1187.6 | 834.6 |
| - Gross farm income. EUR/ha | - | - | 1034.9 | 1040.6 | 964.2 | 581.2 |
| - Gross farm income. EUR/100 EUR total assets | - | - | 7.7 | 9.4 | 10.8 | 9.4 |
| - Gross farm income.. EUR/AWU | - | - | 10348.7 | 14888.2 | 21089.4 | 21654.9 |
| **Portugal** | | | | | | |
| - Total output. EUR/ha | 764.3 | 1031.4 | 944.2 | 1067.3 | 929.9 | 971.5 |
| - Net value added. EUR/ha | 417.1 | 488.3 | 466.1 | 490.1 | 415.1 | 566.3 |
| - Gross farm income. EUR/ha | 480.0 | 477.7 | 454.3 | 475.6 | 390.3 | 527.4 |
| - Gross farm income. EUR/100 EUR total assets | 8.4 | 8.6 | 13.1 | 15.1 | 17.6 | 21.3 |
| - Gross farm income.. EUR/AWU | 2729.4 | 2976.2 | 5088.7 | 8292.7 | 12641.8 | 23853.0 |
| **EU average** | | | | | | |
| - Total output. EUR/ha | 1286.2 | 1436.4 | 1198.2 | 1314.2 | 1568.3 | 2186.5 |
| - Net value added. EUR/ha | 747.6 | 860.9 | 650.7 | 661.3 | 705.3 | 1026.7 |
| - Gross farm income. EUR/ha | 744.6 | 836.4 | 598.2 | 579.9 | 564.8 | 806.3 |
| - Gross farm income. EUR/100 EUR total assets | 5.1 | 5.4 | 6.1 | 7.7 | 8.7 | 9.7 |
| - Gross farm income.. EUR/AWU | 4706.9 | 7399.0 | 10183.5 | 15437.8 | 22360.7 | 32312.0 |
| **Hungary** | | | | | | |
| - Total output. EUR/ha | 901.6 | 842.9 | 825.9 | 1031.1 | 1050.8 | 1229.3 |
| - Net value added. EUR/ha | 263.4 | 187.4 | 150.1 | 198.6 | 185.1 | 309.5 |
| - Gross farm income. EUR/ha | 239.7 | 167.4 | 126.8 | 160.4 | 140.5 | 235.1 |
| - Gross farm income. EUR/100 EUR total assets | 14.1 | 11.7 | 9.6 | 10.0 | 13.6 | 26.3 |
| - Gross farm income.. EUR/AWU | 3292.9 | 3161.2 | 3468.9 | 5173.5 | 5000.1 | 6162.2 |

## Data of the FADN holdings by types of farming

| Type of farming Country | Specialist | | | | | Mixed holdings | | |
|---|---|---|---|---|---|---|---|---|
| | Field crops | Horticulture | Permanent crops | Grazing livestock | Granivore | Cropping | Livestock | Crops-livestock |
| **France** | | | | | | | | |
| - Total output. EUR/ha | 1087.7 | 28362.7 | 7622.1 | 1205.3 | 11828.2 | 1866.82 | 3067.48 | 1460.52 |
| - Net value added. EUR/ha | 474.5 | 11736.5 | 3941.1 | 485.4 | 2168.0 | 762.03 | 796.26 | 529.19 |
| - Gross farm income. EUR/ha | 324.0 | 11001.9 | 3164.3 | 380.9 | 1550.9 | 589.95 | 596.36 | 384.74 |
| - Gross farm income. EUR/100 EUR total assets | 12.8 | 43.5 | 15.9 | 10.4 | 12.2 | 13.86 | 10.75 | 11.55 |
| - Gross farm income. EUR/AWU | 19911.5 | 21710.4 | 24637.8 | 16088.2 | 21550.0 | 17854.5 | 18014.51 | 18696.6 |
| **Italy** | | | | | | | | |
| - Total output. EUR/ha | 1267.8 | 31305.5 | 3613.7 | 2428.4 | 19706.7 | 2185.2 | 2822.3 | 2397.7 |
| - Net value added. EUR/ha | 818.1 | 17130.0 | 2471.2 | 1015.1 | 7102.4 | 1359.1 | 1242.5 | 1174.7 |
| - Gross farm income. EUR/ha | 745.6 | 16750.0 | 2419.6 | 967.3 | 6957.0 | 1309.0 | 1180.2 | 1109.3 |
| - Gross farm income. EUR/100 EUR total assets | 3.3 | 16.8 | 6.3 | 6.1 | 8.5 | 5.0 | 5.9 | 6.4 |
| - Gross farm income. EUR/AWU | 11571.9 | 17914.4 | 13127.7 | 18925.5 | 51639.7 | 10471.7 | 15962.8 | 16823.2 |
| **Austria** | | | | | | | | |
| - Total output. EUR/ha | 1164.6 | - | 7254.4 | 2538.1 | 2719.6 | 2144.7 | 2376.5 | 447.0 |
| - Net value added. EUR/ha | 783.6 | - | 2475.5 | 1305.6 | 1412.9 | 926.9 | 1237.9 | 1119.9 |
| - Gross farm income. EUR/ha | 623.5 | - | 2184.0 | 1182.4 | 1171.3 | 752.5 | 982.3 | 928.8 |
| - Gross farm income. EUR/100 EUR total assets | 10.7 | - | 10.1 | 8.9 | 7.4 | 8.9 | 7.2 | 9.9 |
| - Gross farm income. EUR/AWU | 19207.4 | - | 13423.4 | 12752.9 | 15639.3 | 12883.3 | 12158.9 | 16982.9 |

| Type of farming Country | Specialist | | | | | Mixed holdings | | |
|---|---|---|---|---|---|---|---|---|
| | Field crops | Horticulture | Permanent crops | Grazing livestock | Granivore | Cropping | Livestock | Crops-livestock |
| **Portugal** | | | | | | | | |
| - Total output. EUR/ha | 1108.8 | 5565.2 | 994.3 | 789.1 | 23651.3 | 945.2 | 594.8 | 591.1 |
| - Net value added. EUR/ha | 630.3 | 2401.9 | 565.9 | 304.1 | 5435.5 | 470.0 | 343.5 | 351.1 |
| - Gross farm income. EUR/ha | 598.3 | 2402.6 | 565.9 | 280.1 | 5762.9 | 538.6 | 331.5 | 396.6 |
| - Gross farm income. EUR/100 EUR total assets | 16.8 | 21.0 | 9.4 | 11.0 | 21.0 | 9.6 | 9.9 | 13.6 |
| - Gross farm income.. EUR/AWU | 6670.2 | 4513.9 | 4082.0 | 4945.5 | 12493.0 | 3114.3 | 2911.5 | 5566.7 |
| **EU average** | | | | | | | | |
| - Total output. EUR/ha | 989.9 | 26226.7 | 3355.8 | 1171.5 | 10141.8 | 1645.6 | 2738.6 | 1459.3 |
| - Net value added. EUR/ha | 528.7 | 13000.0 | 2140.4 | 510.0 | 3081.3 | 951.7 | 937.9 | 610.6 |
| - Gross farm income. EUR/ha | 408.6 | 12380.8 | 1967.6 | 418.1 | 2596.2 | 876.1 | 751.0 | 480.7 |
| - Gross farm income. EUR/100 EUR total assets | 5.6 | 24.3 | 10.0 | 6.6 | 12.2 | 7.5 | 8.6 | 7.7 |
| - Gross farm income.. EUR/AWU | 16202.6 | 17306.5 | 14237.4 | 14606.6 | 32747.2 | 11273.6 | 13813.1 | 16411.8 |
| **Hungary** | | | | | | | | |
| - Total output. EUR/ha | 606.9 | 2609.8 | 1973.2 | 1095.4 | 7335.3 | 870.7 | 1673.6 | 954.5 |
| - Net value added. EUR/ha | 147.0 | 1157.1 | 522.9 | 223.0 | 1258.7 | 316.7 | 496.8 | 205.7 |
| - Gross farm income. EUR/ha | 105.5 | 1124.6 | 438.0 | 183.1 | 1042.3 | 284.4 | 437.7 | 155.1 |
| - Gross farm income. EUR/100 EUR total assets | 15.3 | 36.8 | 8.0 | 12.9 | 21.5 | 22.4 | 22.5 | 15.7 |
| - Gross farm income.. EUR/AWU | 4913.9 | 5775.8 | 2820.8 | 3313.0 | 5532.0 | 5728.0 | 5252.1 | 4164.1 |

# Agricultural and environmental policy issues in the CEESA Project (1999-2002) from a Hungarian point of view

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## Abstract

Agri-environmental issues were important during the 1999 CAP reform (European Commission, 1999 a, 1999 b, 1999 c). Negotiations between the EU and the 10 candidate countries were concluded at the end of 2002, and it is very likely that there will be 25 member countries of the EU from May 1, 2004. Farmers in the new member states will have access to EU aid, mainly from the EAGGF, in the form of rural development payments which include agri-environmental support. The above statements underline the necessity of research conducted in the past and the prospects for sustainable development in farming in the Central and Eastern European countries. Authors of the study conducted a survey on the CEESA Project focusing on sustainable agriculture, which was done under the leadership of Prof. Dr. Konrad Hagedorn (Humboldt University) during 1999-2002, and involved researchers from the EU and Central and Eastern European countries. The Hungarian agricultural policy team members took part in setting aims, developing methods, and working out case studies for agricultural policy which preserves biodiversity. The aim of the present study is to show the process, which succeeded thanks to mutual cooperation and understanding. According to the authors, the most important result of the project is the successful establishment of a solid and lasting international network of experts in the field. In order to achieve rapid progress, the authors maintain that the main challenges for all candidate countries are: further improving human resources and building institutions.

## Key words

agri-environmental policies, agri-environmental schemes and measures, biodiversity, EU enlargement, Hungary

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## Introduction

Memorandum of Understanding on Collaboration Regarding Activities for Establishing the Central and European Sustainable Network (CEESA) was submitted through the co-operation of the FAO Subregional Office for Central and Eastern Europe (FAO SEUR) and the Humboldt University (HU). In order to launch the project proposed by Humboldt University and FAO, SEUR agreed, as a first step in establishing the Network, they were going to organise the first CEESA Workshop. The venue of the workshop was Gödöllő University of Agricultural Sciences (the present official name of the university is Szent István University).

For the workshop, held in 1999, (2-7 March), 12 Central and Eastern European countries were invited (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Ukraine). From each of the selected countries, with the exception of Slovenia, one person was called upon to submit a national report prepared under the guidance of HU and the SEUR, and this was discussed during the conference. According to the national reports, the Hu staff have submitted Table 1, which shows the major environmental problems, hazards and opportunities in each country. Apart from country reports, four comprehensive papers were presented.

Hagedorn and Lütteken (1999) expressed their opinion in two lectures: "Background, Scientific Concept and Objectives of the Network" and "Concepts and Issues of Sustainability in Countries in Transition - an Institutional Concept of Sustainability as a Basis for the Network".

Among the staff members of FAO SEUR, Tanic (1999) presented his ideas on: "Improving Farming and Knowledge Systems in Central and Eastern Europe - by CEESA" and Minoiu (1999) gave a lecture titled "FAO Experience, Activities and Views in the Area of Policies for Sustainable Agricultural Development - Conceptual and Practical Approach."

In his opening remarks, among other things, Hagedorn (1999) emphasised "Sustainability as a new paradigm may also serve as the leading principle of our network. What is this network supposed to be? CEESA, meaning Central and Eastern European Sustainable Agricultural Network, is intended to focus on countries in transition and to discuss the topic of *sustainable agriculture* in these countries. It consists of agricultural and environmental or ecological economists and social scientists and it will hopefully stimulate research and communication among the members of the network and develop co-operative relationships with many groups and actors." (Hagedorn, 1999: 5)

Based on the resource papers, during the discussions the participants agreed that *the three main areas* of activities and research treated by the CEESA should be sustainable farming systems, agricultural and environmental policies and the institutional concept of sustainability.

## 1. The initial phase of the project: identification and structuring of main problems and basic objectives

The CEESA project group comprised numerous partners: 15 experts from four universities in EU member states - Humboldt University of Berlin, the Department of

Agricultural Economics and Social Sciences (Germany); Wageningen University, Agricultural Economics and Policy Group (The Netherlands); University of Helsinki, the Department of Economics and Management (Finland) and the University of Newcastle upon Tyne, Centre for Rural Economics (United Kingdom) - and from the Sub-Regional Office for Central and Eastern Europe (SEUR) of the FAO based in Budapest (Hungary). Furthermore, the project group included 23 national experts from the twelve CEE countries involved contributing as subcontractors to the research done within the project.

To allow a broad view of the problems involved, the project formed three Working Groups: A - Institutions of Sustainability, B - Agri-Environmental Policies, and C - Sustainable Farming Systems. On behalf of the Hungarian delegation, we took part in Working Group B and C and in this present study we provide a survey on our work in Agri-Environmental Policies (Working Group B - WGB).

The initial phase lasted from 1 March to 30 June 2000 and was the first step to reach one of the project objectives: analysing present environmental problems and conflicts between transformation and sustainability in the agricultural sector of CEE countries. The results are based on a comparative analysis of data from national statistics and other official sources for all participating countries.

This comparison serves as a starting point for the objective of research phase I "Description of National Institutional Arrangements, Current Farming Systems and Documentation of the Impact of Current Agri-Environmental Regulations."

The initial phase of the project concluded with a 3-day workshop from 31 May to 4 June 2000, in Jelgava, Latvia, where all researchers involved in the project met to discuss preliminary research results and the ongoing project. On the basis of the data obtained, the research group selected the most serious problems to be solved through medium and long-term adjustment of respective structures and policies. So-called "case studies" were defined to deal with these issues during the next four phases of the project.

The data and information were gathered on the basis of a "General National Inventory - Agriculture and the Environment" (further mentioned as Inventory). This Inventory was designed by the partners and compiled by the CEE subcontractors.

It comprises five chapters (Lütteken et al., 2000):

1. Introduction (General Country Information, General Economic Indicators).
2. Environmental Data (Water Quality and Water Use, Soil Quality and Land Conservation, Air Pollution, Biodiversity, Wildlife Habitat and Landscape Biodiversity).
3. Institutions of Sustainable Agriculture (General Institutional Framework for Sustainable Agricultural Development, General Standards for Sound Environmental Agriculture, Institutional Arrangements Applied to Water Resources, Soil and Agricultural Land, Biodiversity and Landscape).
4. Current Farming Systems and Sustainability (Farm Structure and Land Use, Input-output Ratio and Input Consumption, Irrigation and Water Management, Description of Typical Farm Systems).
5. Agri-Environmental Policy (Matrix of Impact Assessment for Agri-Environmental Policies, Participation in International and Regional Conventions).

The Inventory comprised two kinds of data: firstly "objective" data from statistics and official documents had to be collected. Secondly, emphasis was laid on "self-defined"

problems, i.e. subcontractors given the chance to express their own opinions on the most urgent problems related to specific questions. In addition, the Inventory asked for analogous opinions from relevant groups, such as politicians, administrators, interest groups and farmers.

Lütteken et al. (2000) listed the environmental problems, taking into account the comprehensive collection of data (with the involvement of 12 countries) and the country reports published in FAO Proceedings (1999), into the following three groups:

1. Surface and ground water pollution:
   - Lack of storage capacities for manure and slurry,
   - Inadequate handling of manure and slurry,
   - High regional livestock densities in some countries,
   - Inadequate and/or increasing application of pesticides and mineral fertilisers,
   - High percentage of arable land under intensive production,
   - Lack of wastewater treatment facilities.

2. Soil and agricultural land degradation:
   - High levels of wind and water erosion,
   - Lack of financial resources for anti-erosion measures,
   - Existing agrarian structures hampering anti-erosion measures,
   - Degradation of soil structures due to inadequate soil management practices,
   - Decline of soil fertility due to loss of organic matter and inadequate crop rotations,
   - Soil acidification due to lime shortages,
   - Distortion of the water table, salinisation; lack of resources to maintain drainage systems,
   - Abandonment of agricultural land,
   - Contamination of soils with heavy metals and toxic residues,
   - Radioactive contamination (Ukraine).

3. Biodiversity, wildlife habitats and landscape:
   - Decrease of semi-natural areas due to changes in land use and farming methods,
   - Abandonment of marginal areas resulting from increased competition and technical progress in agriculture,
   - Decline in livestock and crop species used in agriculture,
   - Increasing conflicts between farming and nature protection.

Zellei et al. (2000: 122) summarised those main agri-environmental characteristics influencing sustainable agricultural development (SAD) as follows:

Table 1

**Identification of conflicts/problems as basis for Case Studies**

| CEESA research domain | Identified problems |
|---|---|
| Agri-environmental policies affecting SAD-Working Group B | - Agri-environmental policies are not given priority by governments - Institutions responsible for the elaboration and implementation of agri-environmental policies lack the expertise to make such policies effective and goal-oriented - Scarcity of inter-ministerial co-ordination mechanisms and public participation in the decision making process - Lack of funding, unclear legislation, and absence of effective enforcement mechanisms - Lack of transparent and consistent state policy and weak legislative framework and weak implementation - No clarity in objectives and measures oriented to concrete environmental goals - Lack of interdisciplinary approaches and data analysis - Divergence between environmental protection and agriculture - The environmental policy is more oriented to control than to development measures - Most of the politicians, administrators, interest groups and farmers (i.e. Poland) consider these problems as not important: environment protection is not an important issue for agricultural development |

Source: Zellei et al., 2000: 122

During the 3rd CEESA Workshop in Jelgava (Latvia), the case studies were selected in two steps. The first step related to environmental problems and conflicts extracted from the national inventories and specific country proposals made by the subcontractors. In the second step, the final arrangement of case studies was determined by a participatory approach of the whole CEESA research group based on adequate criteria and also focusing on the practical relevance of the problems.

## 2. The first phase of the CEESA Project: problems in the selected case studies

### 2.1. Six EEC country studies

The first phase of research of these case studies covered the period from July 15 up to mid-November 2000. The aim of this phase was to describe the main features of the relevant problems, indicate the players involved, and outline how their strategies and policies have evolved during transition. The research methods focused on documentation and in-depth interviews with key players. The current agri-environmental programmes and regulations relevant to the specific case-study problem were described, alongside a preliminary analysis of the degree of policy implementation, its enforcement mechanism and overall effectiveness. It appeared necessary to emphasise how privatisation, restructuring and the transformation process in general influenced/shaped the formation of environmental policy and its delivery system (including the process of reshaping/adjusting/setting up relevant policy making and implementing institutions) with reference to the case-study domain.

The research took the form of six comparative case studies. The basic problems of the case studies were grouped into the following research categories.

<div align="right">Table 2</div>

**Ground-level problems according to EEC countries**

| Resources | Country |
|---|---|
| Water | Slovakia, Poland, Lithuania |
| Biodiversity | Czech Republic, Slovenia, Hungary |

Source: Zellei et al., 2001: 2

Each national case study examined a specific agri-environmental problem and in doing so highlighted particular aspects of the policy system. The first research phase sought to establish the way in which the policy process has changed since the late 1980s by addressing the specific case-study problems. The underlying assumption was that policy systems, whether socialist or liberal-democratic, are problem-solving systems. Clearly societies in the process of transformation face many similar but also some different problems. However, the policies, as well as the political and organisational resources available to solve these problems, may vary considerably. The first phase of the project examined this transition retrospectively.

Each agri-environmental problem described in the case studies is complex in nature with regard to the policy process (such as enforcement, monitoring, incentives, training, participation, ministerial co-ordination etc.).

## 2.2. Hungarian case studies

The Hungarian team was looking at two case-study areas with similar conflicts between agriculture and biodiversity conservation on fragmented and scattered habitats; one area (Dévaványa) is in in the National Agri-Environmental Programme and the other (Borsodi Mezőség) included in the SAPARD programme (FV Értesítő, 2001).

Certain parts of both areas are under legal protection; Dévaványa lies within the Körös-Maros National Park while Borsodi Mezőség belongs to a Landscape Protected Area (LPA). Several precious yet threatened plant and animal species, including the great bustard, can be found in both areas and their survival depends on the traditional management of steppe land habitats.

In the study areas there are conflicts between conservationists and farmers because of the loss of revenue resulting from restrictions placed on agriculture in the protected areas. Consequently, their agricultural production is less profitable to those farming land outside the protected areas. If conservationists would like to achieve environmentally friendly agricultural practices in these areas, then an effective incentive/compensation system is required to secure farmers' co-operation. One way of persuading farmers to respect the environment is to financially reward them for doing so.

In the research period from July 15 2000 to 20 November 2000 in the subregion of Dévaványa, all farmers producing in protected areas were obliged to comply with rules and restrictions, but without any compensation for doing so. However, the Bükk National Park Directorate used financial incentives in addition to legal procedures (control and demand) in the Borsodi Mezőség LPA.

The Hungarian team surveyed the main agri-environmental problems in the two subregions which were investigated in a more than 40- page study (Szabó et al., 2001a).

*The research methods* focused on identification of information sources through statistical data analysis and literature review; thus, the relevant national literature sources, strategic programmes, plans, and policies were analysed.

General statistical data were only available for a category larger (regional, NUTS 4 level) than the selected case-study area, which was taken from a recent General Agricultural Census (GAC). It was conducted during the spring of 2000. The results of data analysis revealed that it gives an accurate representation of the case-study area.

Besides secondary information sources, explorative interviews were made with key players and relevant stakeholders, i.e. organisations, politicians, local authorities etc. Such interviews aimed at:

- understanding their preferences, positions, strategies, policies and mindsets,
- gathering information about the organisational and policy framework, plus tensions and alliances surrounding land use changes, and the conflict between agriculture and nature protection.

*The conclusions drawn* from statistical data, relevant literature and explorative interviews made with key players and stakeholders are the following:
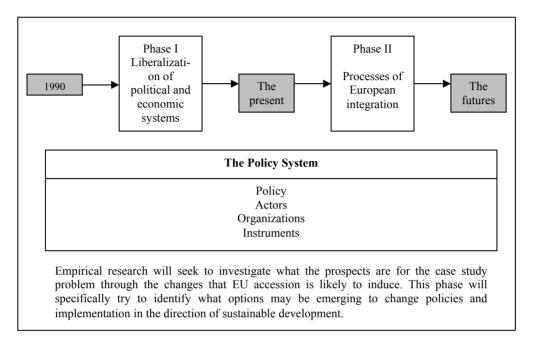
1. The area of natural habitats shrank most due to the intensive production in the 1970s and 1980s when green corridors disappeared and wildlife populations were prone to isolation.
2. As a result of land restitution the situation improved from the conservation point of view as the environmental pressure decreased. But at the same time major parts of designated protected areas now consist of privately owned farmed areas. The achievement of conservation objectives in areas that are environmentally rich, including small private holdings, will necessitate a different approach on the part of nature conservationists. Private ownership may necessitate extensive consultation with stakeholder interest groups and the establishment of compensation or incentive systems to ensure the co-operation of farmers.
3. At present farmers tend to be struggling to survive economically and have little regard for nature conservation issues unless it is linked to some sort of financial support. Unfortunately very limited resources are available for environmentally friendly farming practices. Nature protection authorities mainly regulate by "command and control", and the incentive measures are very rarely used. Extension or advisory services are also scarce.
4. A large part of the population in the case-study areas is engaged in agricultural activities without any alternative income source. Support activities for farm diversification should be started. Consequently, this issue has to be tackled within the broader context of integrated rural development.
5. Changes in government policy towards agriculture and the environment, resulting from new economic and political conditions, created opportunities to reconcile nature conservation and agricultural policies. Many policy changes favourable to the environment have taken place, even if environmental protection was not the immediate goal. Although the legal framework for supporting agri-environmental measures is in place, in practice these measures cannot be implemented because of the lack of required financial resources. The institutional process for enacting the programme is under preparation, but financial sources and detailed rules are missing.

6. The tendency to solve the majority of conflicting problems between nature conservation and agriculture by legislative measures persists. It results in penalty sanctions imposed by the National Park Directorate on farmers who carry out improper management in protected areas.

7. The National Park Directorate struggles with budget constraints and limited human resources.

8. Local offices of the Ministry of Agriculture and Rural Development are overloaded with administrative work and do not regard the promotion of environmentally friendly production as their responsibility.

9. At the top-level administration there are many constraints and tensions. Co-operation between the Ministry for Environment and Water (MEW) and the Ministry of Agriculture and Rural Development is poor as the political interests of the ministries are at odds.

## 3. Second phase of the research work: analysis of the effects of EU accession and international agreements on agri-environmental policy

The research objective of this phase was to analyse the effects of EU accession and international agreement on agri-environmental policies. In the course of the empirical research, the elements of the policy system (relevant policies, actors, organisations and policy instruments) were subjected to thorough analysis with special focus given to what prospects they have for the case-study problem which EU accession is likely to cause.

Figure 1

**Analytical framework for research phase I. and II.**



Zellei, Gorton, Lowe: Newcastle, January 2001

## 3.1. The Hungarian findings

In a 15- page study (Szabó et al., 2001 b) the Hungarian team summarised the Hungarian experiences, which were also presented at the ACE Conference held in Nyitra (Slovakia) in September 2001 (Szabó et al., 2001 c).

In their study (Szabó et al., 2001 b) the Hungarian team concluded the following:

In contemporary Hungary legislation is the principal policy instrument in the field of environmental protection and nature conservation. Financial incentives play a very minor role in this issue (Szabó, 1999 a). As the country moves to a mixed economy, it may be that a mixture of methods is required to resolve conflicts between agricultural production and environmental conservation. The implementation of agri-environmental schemes in the pilot areas of the NAEP and the SAPARD Programme might help in tackling the problem.

The Habitats Directive 92/43/EEC, Birds Directive 79/409/EEC and the Regulation 1257/99 on Rural Development are key EU measures that will significantly influence the agri-environmental problem in the case-study areas because the stated measures are meant to deal with the conflict (farming vs. conservation in valuable habitat areas) by implementing more specific measures (Official Journal, 1979, 1992, 1999 a). The scientific work, including the designation of NATURA 2000 areas, for the adoption of the Birds and Habitat Directives, is well under way (Környezetvédelmi Minisztérium, 2001). It will not be possible

to support farmers financially on the basis of the Habitats Directive but, in the future, they will be able to receive support within the framework of Regulation 1257/99. .

The Nature 2000 will force conservationists to create measures to ensure the conservation of valuable habitats while agri-environmental measures under the NAEP and SAPARD (anticipating Regulation 1257/99) will establish support for environmentally friendly farming practices. These two types of EU legislation should create a framework for a new and closer working relationship among local officials. The issue of farming in environmentally fragile areas is related to many policy institutions in Hungary as at present an integrated approach doesn't exist, unlike in the EC 1257/99 Rural Development Regulation. Both the institutional and policy framework regarding the research issues are shared by many groups at the national level.

Nature conservation policy issues are developed in the Nature Conservation Office of the Ministry for Environment and Water, while agri-environmental and rural development issues are hosted in the MARD. The implementation of NAEP faces many difficulties, and this is clear given that the NAEP has not received any financial resources for its implementation. This might cause further disappointment and distrust in local people towards the government. Farmers in the pilot area for NAEP, and even local officials who will be responsible for its implementation, have limited information on the programme.

The situation pertaining to the integration of agri-environmental issues and rural development in Hungary is unclear at the moment. The two fields are distinctly separated in Hungary in legislative, organisational and financial respects. These problems make it impossible to start the practical work in the designated ESAs, including the Dévaványa and the Borsodi Mezőség Areas.

The integration of policies should entail the intensive participation of the relevant stakeholders. The human capacity and financial resources of the agricultural administration need to be increased.

## 3.2. The Comprehensive Report

Analysing each national case study, the Newcastle Team, which manages WGB, submitted a comprehensive report (Zellei et al., 2001).

The research had three main components, including:

1. Pre-accession Policies
   Is the case-study problem presented in the SAPARD (or other relevant programmes such as PHARE or ISPA)? How, if at all, will the SAPARD affect the way the case-study problem is dealt with?

2. The Accession Process
   How compatible are domestic agri-environment policies with EU rules and international agreements? This will have two components. Firstly, it will identify what progress has been made in implementing relevant aspects of the Acquis and what the consequences have been or will be for the environmental management/regulation of agriculture. Secondly, it will compare the existing national regulatory framework in relation to the case-study problem with relevant EU and international requirements to identify the degree of congruence in terms of objectives and measures.

3. The Likely Impact of Harmonisation
   Effective implementation of policies and regulations implies a certain capacity to carry out tasks such as counselling, training, monitoring and enforcement. With respect to the relevant EU directives, it will be necessary to conduct an audit of the capacity of national and regional administrations to implement these policies and rules.

All the three components entailed collection of appropriate documentation, semi-structured questionnaires delivered to and interviews with relevant local, regional and national officials involved in running SAPARD, as well as with key actors involved in the case-study problem.

The Newcastle Team summarised the main data of the six country case studies in Table 3.

Table 3

**Description of the Six Country Studies**

| Country | Authors | Agri-environmental problem | Resource | Meta-narrative |
|---------|---------|----------------------------|----------|----------------|
| Czech Republic | Prazan (2001) | Regional and local level co-ordination in sensitive area | Biodiversity | Designing effective organisations and policy instruments |
| Hungary | Szabó et al. (2001) | Species protection and landscape protection | Biodiversity | Designing effective organisations and policy instruments |
| Lithuania | Zemeckis and Lazauskas (2001) | Groundwater pollution in karst landscapes | Water | The complexity of managing the policy system |
| Poland | Karaczun (2001) | Water pollution from animal waste | Water | National level co-ordination (or the lack of it) between the Ministry of Agriculture and the Ministry of Environment |
| Slovakia | Kovács et al. (2001) | Nitrate pollution on 'Corn Island' | Water | Implementing an effective mix of policy instruments |
| Slovenia | Barbic et al. (2001) | Environmentally sensitive rural development in National Park | Biodiversity | The level of participation in rural development at both regional and local levels |

Source: Zellei et al.: 2001: 3

According to the Newcastle Team, regarding the Europeanisation process, it can be concluded that:

- *There is a widespread perception that the EU integration process will have a positive effect on water quality and nature conservation.* It is presumed that key EU measures will improve and develop a safer system to control water pollution, and the SAPARD and NATURA 2000 should help in resolving conservation vs. farming conflicts. Both measures will bring more targeted and specific prescriptions and it is expected that EU accession will facilitate their enforcement.
- *The training of farmers.* Efficient training in the requirements of relevant EU measures will benefit educated farmers. However, more attention should be paid to small-scale and non-commercial farms, which make up the majority of farmers. A different focus on programmes may be required to ensure that these farmers can also benefit from EU measures and, in return, take additional responsibilities for the environment. Model farms where farmers can see how environmental protection tools are working have been beneficial.
- *Local government will have more responsibilities and administrative power.* EU membership will encourage a closer co-operation among actors/stakeholders relevant to the case study in order to implement EU measures. In this way there will be a shift of responsibilities to a regional and local level to deal with the case-study problem. Support from the EU will require the deeper involvement of local government structures.
- *Implementation of EU measures will increase administrative work.* The introduction of EU support schemes and legislation requires improvements to the CEECs system of monitoring and control. Administrative workloads related to monitoring will increase and put further pressures on staff. While some institutions are coping well others have insufficient human resources (both quality and quantity). Additional resources are therefore required for a credible system of effective governance and enforcement.

## 4.  The third phase of the research work: comparative studies based on natonal case studies

As an example of third phase studies, case studies of the Borsodi Mezőség environmentally sensitive area (ESA) and the Bilé Karpaty landscape protected area (LPA) were compared by the Hungarian team (Balázs et al., 2002).

*These two case studies* were analysed in order to enable identificaton of the similarities and differences between the farming vs. nature conservation issues of Bilé Karpaty and the Borsodi Mezőség. The results will serve as a basis for a round table discussion and dissemination of alternative policy choices and recommendations in the final phase of the research.

*Bilé Karpaty* (White Carpathians) is located on the border with Slovakia. The core of the conservationists' interest, beside the forests, are meadows rich in species (aprox. 6,000 ha) such as rare orchids. The region is relatively dry and the meadows are not very useful for agriculture.

*Borsodi Mezőség* (ESA) covers more than 32,000 ha and situated in North-East Hungary. It covers a 17,392 ha protected area plus the adjacent buffering semi-natural areas and floodplains. The main values of the ESA are the internationally endangered animal species such as great bustards, rollers, sakers and kestrels. The area is a very diverse

grassland habitat complex dotted with wet habitats and arable land, which was created and shaped by traditional grazing agriculture in recent centuries.

## 4.1. Objectives and methods

The overall goals of this research phase were:
1. to fully understand the case-study problems in Bilé Karpaty and Borsodi Mezőség, identify obstacles and difficulties regarding the implementation of the relevant Birds, Habitats Directives, and changes in institutions and in farming systems, and
2. to achieve a comparative understanding of national differences, similarities and specifities among the participating countries.

Critical similarities and differences between the Bilé Karpaty and the Borsodi Mezőség case-study problem are sought based on the following key headings:
1. range and versatility of policy instruments (their potential to support different farm structures/systems).
2. policy implementation, enforcement and monitoring process/difficulties.
3. rationale for policy action, taking into account the regional economic context (the trajectory of the regional economy).
4. interaction among actors. Who are the key actors and what are their roles? Are certain activities necessary and is anybody carrying them out? Is there a gap in roles? How effective is interaction?
5. farmers' attitudes/understanding of the case-study problem. To what degree does farm structure differ from the Czech case? What difference does this make when dealing with the problem?

## 4.2. Main conclusions of the comparative study

1. "Command and control" type regulation predominates in the areas of nature protection in both countries, and incentive-type support is not widespread.
2. Generally speaking Hungary fulfilled the requirements of NATURA 2000, however there are no data available on the Czech situation.
3. Regarding legislative matters, both countries accepted EU-conform laws, however there are a lot of things that must be done to develop the organisational system and infrastructure of human and physical assets regarding nature conservation.
4. In Hungary financial incentives for farmers engaging in environmentally friendly practices is the MARD's jurisdiction, working under the NAEP's umbrella, while this task is shared between the MA and ME in the Czech Republic. Co-operation between the two ministries seems more harmonised in Hungary.
5. According to the case studies and the study-tour in the Czech Republic, pilot area farmers are more optimistic regarding the future of environmentally friendly production than their Hungarian colleagues.
6. In both cases co-operation between agricultural and environmental state administration is still weak at all levels. Some progress has been seen on a ministerial level in Hungary since the National Agri-Environmental Programme was launched and accordingly a joint Ministerial Order regulating Environmentally Sensitive Areas Scheme was announced early in 2002 (Ángyán et al., 1999, 2001; Környezetvédelmi Értesítő, 2002; Magyar Közlöny, 2001 a).

7.  Consolidation of regional and local level administration still does not occur although it is a prerequisite for proper administration and control of agri-environmental schemes. In this respect similar tendencies are seen in the BK. There is virtually no communication between the Ro-MoA and the LA-PLA. The MoA policies and measures are aimed at maintaining agricultural production in the region. However, there is a nice example of co-operation between the LA-PLA and a nature conservation NGO in the BK, showing how an NGO can help offset deficiencies of public administration (LA-PLA even uses of the NGO's offices and many administrative officers are also members of the NGO.). Local actors in the BK tried to overcome legislative inefficiencies.

8.  The Tiszatáj Foundation's initiative (in Borsodi Mezőség) could also be developed into this sort of symbiosis with the NPD, however clashes between individuals as well as other factors remain obstacles.

9.  Farmers are more concerned about their environment in the BK. This may be explained by well-entrenched positive traditions and the more viable farm structure that remained after the privatisation process. In the Borsodi Mezőség privatisation created an enormously fragmented farm structure and economically less successful farms operating with medium or low quality machinery. Consequently farmers are struggling to survive economically and are less concerned about the environment.

10.  Channelling information, harmonising interests and initiating discussion to enhance interaction among the NDP, NGOs, local level agricultural administration and farmers could be a way out, but these measures aren't being fully enacted by any of the local actors. The Cötkény Association (in Borsodi Mezőség) tries to fill this role but with little success because of a lack of theoretical and real power to carry out its objectives. Greater co-operation by all local actors might help to make integrated rural development the region's long-term strategy. (Mikola and Sárvári, 2000).

## 5. Fourth phase of the research work: comparative analysis of agri-environmental issues in the accession process - case studies of boidiversity issues

Another comparative report revealed the differences and similarities among the Czech, Hungarian and Slovenian case studies regarding their development problems, land ownership structure, available policy tools, players' attitudes, as well as co-operation and further opportunities for economic development. On the basis of the informative Czech case study and this synthesis report, discussion was carried out in phase IV. A Participatory Learning Workshop (PLW) was organised in the Czech Republic, which seemed a preferable method for practically generating new thinking and interaction among experts that policy choices/alternatives require.

Western European officials and experts involved in nature conservation issues participated in the workshop, which provided a unique opportunity for the exchange of understanding between them.

The PLW included a field trip, discussion of the case-study problem of the host country, potential solutions, and consideration of the synthesis report, which allowed for generalisation and consideration of possible alternatives. Potential policy alternatives were investigated in the light of the EU integration process with particular attention on forthcoming EU agri-environmental policies (Rural Development Regulation 1257/99) and on relevant Directives (Birds and Habitats). The challenges of these policies were explored

in terms of policy integration, human capacity building, co-operation, and information flow among actors and their shifting responsibilities.

At the final CEESA conference, held in November 2002, *Philip Lowe* evaluated the work of Working Group B as mutual learning and working and the principles and practice of comparative understanding were succeeded (CEESA, 2002).

He summarises *the three main points* of the Czech, Hungarian and Slovenian case studies (Zellei et al., 2002) analysing biodiversity issues, especially Challenges of Habitat and Bird Directives, as follows:
- uncertainty regarding land-ownership and land-use,
- agricultural and environmental policies are not aligned,
- the role of the local actors is marginal.

Finally he remarked, that the candidate countries should aspire to get appropriate balance between legislation and incentives in the field of agri-environmental policies.

## Epilogue

The first call for tenders relating to the National Agri-environmental Program was announced in Hungary in 2002 (Magyar Közlöny, 2001 a). In order to help the program, the MARD was assigned 2.2 billion HUF from the 2002 national budget for agriculture. The MEW assigned another 0.3 billion HUF for the ESA target project.

The National Agri-Environmental Program's regional projects encourage farmers to establish and maintain environment-friendly management practices on specific locations, meaning the so-called Environmentally Sensitive Areas, where the maintenance of agricultural activities is especially important in the long-term protection of biology, landscape, and historical landmarks. To this end, the Program contains rules for managing and measures that suit the specific characteristics of that region. After agreeing to the measures, farmers are then rewarded for implementing the measures. There were 11 experimental model areas in the ESA project in 2002.

Farmers who voluntarily join any of the arable crop production or grassland management systems agree to respect the management rules, and the state agrees to provide the relevant support payments in two equal parts (the first is given when the farmer signs the contract and the second is when he/she fulfils his/her tasks at the end of the year). There are two types of rules in each management package. The first type of rules applies to the ESA project and respecting the rules is compulsory for farmers involved in the project. The other type of rules is different in each scheme, because it contains elements specific to that management system.

Applicants from the Borsodi Mezőség were prominently successful in ESA target tenders, especially in the projects aiming at the protection of the great bustard.

## Acknowledgements

## List of abbreviations

| | |
|---|---|
| AE | agri-environmental |
| BK | Bilé Karpaty |
| ESA | Environmentally Sensitive Area |
| ECOVAST | European Council for the Village and Small Town |
| EU | European Union |
| FC | farmers' consultant |
| IUCN | International Union for Conservation of Nature and Natural Resources |
| LA- PLA | Local Administration of Protected Landscape Area |
| LFA | Less Favoured Area |
| LPA | Landscape Protection Area |
| MA | Ministry of Agriculture, Czech Republic |
| MARD | Ministry of Agriculture and Rural Development, Hungary |
| ME | Ministry for Environment, Czech Republic |
| MEW | Ministry for Environment and Water, Hungary |
| NAEP | National Agri-Environmental Programme |
| NGO | Non-governmental Organisation |
| NPD | National Park Directorate |
| PA | Protected Area |
| RoMoA | Regional Office of Ministry for Agriculture |
| SAPARD | Special Accession Programme for Agriculture and Rural Development |
| SDA | Subregional Development Association |
| WWF | Word Wildlife Fund |

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# Farm diversification in Sapard-microregions[17] of the Northern Great Plain in Hungary

Alajos Fehér[18]

### Abstract

In Hungarian agriculture farm diversification is rooted in the non-agricultural activities of large-scale farms in the seventies. At the end of the eighties and early in the nineties both the farms themselves and the industrial service firms doing business with them were privatised and reorganised, leading to a decline in farm diversification. Over the last ten years new forms of diversification have evolved in a new economic environment with new farm structures. Using a separate database for each community we investigated the rate of diversification in farms belonging to different farm sizes. A special index was used for the aggregation and comparison of different activities. With the use of principal component analysis the correlation was explored between the index and various parameters of agriculture, human resources, regional performance and personal incomes.

### Key words

Farm diversification, Northern Great Plain in Hungary, regional economies, SAPARD, Principal Component Analyses,

## Introduction

According to Hutchinson's Dictionary of Economics (*The Economist Books, 1989*), diversification is a broadening of the range of goods and services within a company or within a given geographical area.

*Griffiths (1987)* adapted this term to agriculture, describing diversification as "farm-based activities not directly concerned with producing crops and livestock and which involve marketing contact outside the agricultural industry. Consequently value-added activities (by processing and marketing), farm tourism and recreation services form the main categories of diversification".

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[17] *The natural, economic and social space occupied by villages forming associations for the elaboration of microregional strategies and operative programmes in connection with Hungary's SAPARD Programme are regarded as such microregions.*

[18] *Regio Partner Ltd. for Research and Consulting of Rural Development, Kompolt*

*B. W. Ilbery (1988)* widened this definition to include organic farming and the production of unconventional livestock and crop products (e.g. sheep's milk, goats, deer, flaxseeds, triticale, medicinal herbs), but off-farm sources of income from other economic activities were still not included in the term farm diversification.

A more general definition, giving a wider interpretation of the term, can be found in the work of *L. Delgado et al. (1997)*, who considered that farm diversification could be perceived "as a process of adjustment to major changes in relative costs, benefits, risks and uncertainties of different household income generation strategies".

A similar broader interpretation is employed by *A. Boulay (2000)*, who defined farm diversification as "the introduction into the farm business of Alternative Farm Enterprises bringing any form of non-agricultural income movement on and off holding and/or any conventional production falling outside the price support scheme of the CAP in order to generate a new source of income".

In the present study the term will be used in the narrower sense.

Agricultural over-production and the reform of the Common Agricultural Policy led to a reduction in agricultural incomes and to an increase in regional differences in wealth among the member countries of the European Economic Community in the 1980s. One possible way out was farm diversification, which was achieved to different extents and in different ways in various countries, taking advantage of community and national grants. According to *A. Boulay (2002)*, for example, British farmers opted for structural diversification, and French farmers for enterprise diversification.

According to statistics published in 2002, 60 % of Scottish farms had no agricultural income in 1991, and this proportion had risen to 77 % in 2001. The fact cannot be ignored, however, that within the non-agricultural incomes, on-farm activities made up only 5 % in 2001.

Research carried out by the NFU in Great Britain in 1999 indicated that farm diversification was hindered by lack of finance, poor business skills, a limited supply of trained labour, and lack of access to marketing advice.

Prior to the 1990s non-agricultural income played an important role on Hungarian farms, although at times the acquisition of such income was discouraged by the state through the imposition of penalty taxes. From the mid-seventies, however, especially in less prosperous areas of the country, tax credits and other means were devised as an incentive for farm diversification.

It was partly thanks to this that non-agricultural activities soon became popular in Hungary. In 1975, for instance, 22.5 % of the gross product of state farms and 23.7 % of that of farm co-operatives was derived from non-agricultural activities. By 1987 these ratios had increased to 40.6 % and 38.2 % respectively, accounting for 46 % of the pretax income of the state farms and 55 % of that of the co-operatives. In this same year 33.7 % of state farm workers and 40.7 % of co-operative workers were employed in non-agricultural endeavours. (On large-scale farms in the North Plains Region these endeavours were responsible for 34 % of the gross product, 62 % of the pretax income and 54 % of the labour force.) During this period practically all Hungarian farms carried out some form of non-agricultural activity, organised basically in two different ways:

- *Within the farm itself* (processing of food or other agricultural products, sand and stone quarrying, community services, trading). In a technical sense, these correspond with on-farm structural diversification in West European countries.
- *In towns, at some distance from the farm itself* (building work, manufacturing of industrial goods, transportation, community services). These can be regarded more as off -farm enterprise diversification.

The major characteristics of farm diversification in Hungary between 1975 and 1990 were as follows:

- Within the command economy, they also bolstered the national economy outside the agricultural sector (by providing labour for industrial work, cheap subcontracting for industrial firms and community services which were otherwise lacking).
- During this period there was no agricultural over-production in Hungary. Agriculture was characterised by specialisation and mass production. All agricultural products found a market within the framework of the COMECON. Diversification was motivated not by the agricultural market, but by the low profits to be gained in agricultural production.
- The proportion of non-agricultural activities rose most rapidly and to the highest level in less prosperous areas of the country.
- The profit gained from non-agricultural activities was used to finance agricultural losses within the farms. These losses grew rapidly, so the profit motivation declined. Limited funds for development were only available from state subsidies, the criterion for which was an increase in the number of staff and in the sales, virtually regardless of profitability (*Fehér A. 1989*).
- There was no regional economy in Hungary in the Western European sense; co-operation with non-agricultural sectors was characterised by a complete lack of organisation, with the farms playing a subordinate role.
- The reduction in farm incomes and in state subsidies had a similar effect to that observed in Western Europe.

It is worth considering these factors if we wish to understand why non-agricultural activities suddenly collapsed in the late 80s and early 90s. The major causes of this were:

- Hungarian industry and agriculture simultaneously lost their markets in the ex-socialist countries. The industrial concerns immediately terminated their co-operation with the farms. Even among on-farm endeavours only a limited number of the goods produced were intended for local or regional markets, so they were also significantly affected by the loss of markets.
- The accumulating losses and lost income, together with high fixed costs, led to a liquidity crisis in the farms (*Fehér A. 1992*).
- The farms attempted to adjust to the new situation by laying off their work force, by privatising the non-agricultural endeavours and by selling off machinery and equipment. This took place at a time when agriculture was undergoing a complete, radical structural transformation. This process was accompanied by the mass bankruptcy of the large state farms and co-operatives, a high rate of rural unemployment, a radical drop in agricultural production and a consequent reduction in the share of agriculture in the national economy.

In the first half of the nineties it was an exception for diversified large farms to survive. The viable part of the non-agricultural endeavours became private enterprises with

one or more owners. The new family-run farms were characterised by a simple production structure. The earlier forms of farm diversification were no longer viable and development came to a standstill. A frantic search was made for solutions to these problems and new forms of enterprise began to emerge in the late nineties.

Below, the situation and special aspects of farm diversification will be illustrated in the North Plains region, a fundamentally rural, agricultural area, indicating its role in the economy of the SAPARD microregions. The following principal topics will be investigated in our study:

- What activities represent the agricultural and non-agricultural diversification in the SAPARD microregions of the Northern Great Plain in Hungary at the turn of the century?
- What correlation vcv exists between the rate of diversification and the regional performances and personal incomes and the most important agricultural indices in the study area?

## Database, methods

The database used in the research was the complete agricultural census made in 2000, from which the data for rural communities were utilised. Communities were regarded as *rural* if the population density was less than 120 persons/km$^2$ and if there were no major industries or traffic junctions in the area. Farms were divided into five different categories according to size.

The macroregion investigated covers an area of 17,729 km$^2$ and is the home of 15.3 % of the Hungarian population. The population density is 88 per km$^2$. Agriculture is practised on 76 % of the total area and the productive land area ratio is 85 %. During the course of the General Agricultural Census a total of 220,191 agricultural producers were recorded in the Northern Plains region, including part-time workers and other very small-scale farm units. Some 94 % of the farms had less than 10 hectares of land. A total of 452,000 people work on the farms, but only 7 % of these are employed on medium-sized holdings with 10.1-300 hectares of land.

With the aid of the DATASTAR database and self-designed methods, the available added value index per capita and taxable income per capita were calculated for each community. *Feher A. (2001)* The formula of the added value is as follows:

*taxable personal income + pretax income of firms + yearly amortisation of firms*

Using the SPSS 11.0 statistical program package available to the Regio Partner Ltd., principal component analysis was carried out on the above-mentioned database using the following variables, which are considered to be relevant: (ratio of agricultural land; - number of animals per arable hectare and grassland; - ratio of commodity-producing farms of more than 50 hectares; - agricultural area per capita and per farm; - ratio of farm employees with secondary or higher qualifications; - aggregated, non-agricultural diversification index; - density of population; - taxable personal income per capita; - available added value per capita; - ratio of farms dealing with alternative crop production; - ratio of farms dealing with alternative animal species; - ratio of organic farms in crop production; - ratio of organic farms in animal husbandry; - ratio of farms now being converted to organic farming; - ratio of farms intending to convert to organic farming; - ratio of land sown to cereals; - ratio of

arable land; - quality of arable land in gold crown value; - ratio of farms dealing with meat processing, milk processing, mixed fodder production, vegetable and fruit processing only for the market.

Among the principal components of the added value per capita index which exhibited significant values, those variables which were significant in themselves (having principal component loadings of more than 0.32 in the case of P=351 degrees of freedom and $a^2_{ij} \geq r_{5\%}$) were selected from the model [for further details, see *Sváb J.* 1979]. Using these indices as the variables, principal component analysis was repeated. An unrotated solution was applied in the model. The values of the communalities ($h^2$) were above 0.5, while the cumulative eigenvalues ($\lambda$) of the five principal components were above 60 %.

## Results

1. At the turn of the century the farms in the study region were involved in the following non-agricultural activities:
    - *processing of agricultural products* (mixed fodder production, meat processing, milk processing, vegetable and fruit processing, wine-making, other food industry activities); *primary and secondary wood-working industry; trading; catering; transportation; crafts; other non-agricultural activities.*

In the present paper agricultural diversification will be examined taking *organic farming, alternative plant production* (ornamentals, production under polythene and glass, strawberries, tree nurseries) and *alternative livestock farming* (fur farms, rabbit and ostrich breeding, bee-keeping) as examples.

The territorial distribution and proportions of the various activities are summarised in Table 1 and 2.

Table 1

**Non-agricultural diversification of medium-sized farms in the Northern Plains region in 2000**

(Number of farms involved in the given activity as a percentage of the total number of farms in the microregion)

| SAPARD microregions | Meat processing | Milk processing | Trading | Catering | Other food industry, wood-working industry, crafts | Mixed fodder production | Trans-portation | Other non-agricul-tural activities |
|---|---|---|---|---|---|---|---|---|
| Bihar | 0,00 | 0,00 | 0,68 | 0,00 | 0,00 | 0,00 | 1,08 | 0,68 |
| Debrecen Agglomeration | 0,00 | 0,61 | 4,19 | 0,00 | 0,76 | 0,99 | 0,91 | 1,60 |
| Derecske | 0,00 | 2,70 | 2,25 | 0,00 | 0,00 | 0,00 | 3,15 | 0,90 |
| Hajdúnánási | 0,00 | 0,00 | 0,92 | 0,00 | 0,00 | 0,00 | 0,92 | 0,69 |
| Association of Hajdú Towns | 0,00 | 0,00 | 3,19 | 1,21 | 0,76 | 0,00 | 2,28 | 1,52 |
| Kismörösmenti | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 2,70 | 0,00 |
| Sárrét | 0,59 | 1,92 | 2,66 | 0,00 | 0,89 | 1,48 | 3,69 | 2,36 |
| Tiszamenti | 4,04 | 0,65 | 0,65 | 0,00 | 0,00 | 0,00 | 0,81 | 1,45 |
| Jászság | 0,00 | 4,05 | 3,69 | 0,00 | 0,00 | 0,86 | 1,97 | 0,98 |
| Karcag | 0,71 | 0,99 | 1,56 | 0,57 | 0,57 | 0,85 | 1,56 | 1,56 |
| Mid-Tisza Region | 0,00 | 0,86 | 1,72 | 0,00 | 0,00 | 0,64 | 1,07 | 2,15 |
| Szolnok | 0,66 | 1,48 | 2,46 | 0,00 | 0,66 | 0,00 | 1,81 | 1,31 |
| Tiszahát | 0,00 | 0,00 | 1,67 | 1,26 | 0,00 | 0,00 | 1,67 | 0,00 |
| Tiszazug | 0,00 | 0,82 | 2,45 | 0,00 | 0,00 | 0,54 | 2,17 | 1,90 |
| Törökszent-miklós | 0,00 | 0,87 | 1,73 | 0,00 | 1,45 | 0,00 | 3,76 | 0,87 |
| Bereg | 0,00 | 0,00 | 1,36 | 0,76 | 0,00 | 0,00 | 1,96 | 0,91 |
| Csenger | 0,00 | 0,00 | 1,13 | 0,00 | 0,00 | 0,00 | 0,38 | 0,75 |
| South Nyírség | 0,00 | 0,00 | 2,90 | 0,00 | 0,00 | 0,00 | 3,26 | 2,17 |
| South-East Nyírség | 0,00 | 0,00 | 2,44 | 0,00 | 0,81 | 0,00 | 1,83 | 0,81 |
| First Nyírség | 0,00 | 0,00 | 2,83 | 0,00 | 1,62 | 0,00 | 1,62 | 2,70 |
| First Szabolcs | 0,00 | 0,00 | 0,99 | 0,00 | 0,99 | 0,00 | 0,00 | 0,00 |
| Upper Dada | 0,00 | 0,00 | 2,53 | 0,00 | 0,72 | 0,00 | 1,81 | 2,53 |
| Upper Szabolcs | 0,00 | 0,00 | 1,28 | 0,00 | 0,00 | 1,28 | 1,28 | 2,56 |
| Upper Tiszavidék | 0,00 | 0,00 | 2,76 | 0,69 | 0,00 | 0,69 | 2,53 | 2,07 |
| Central Nyírség | 0,00 | 0,00 | 1,73 | 0,00 | 0,00 | 0,87 | 1,30 | 1,73 |
| Rétköz | 0,00 | 0,00 | 3,91 | 0,00 | 0,00 | 0,00 | 6,64 | 1,95 |
| Szatmár | 0,00 | 0,00 | 1,88 | 0,00 | 0,67 | 0,54 | 2,82 | 0,94 |
| Túrmellék-Erdőhát | 0,00 | 0,00 | 2,31 | 0,00 | 0,00 | 0,00 | 3,08 | 1,54 |
| Non-classified settlements | 0,00 | 0,00 | 3,57 | 0,00 | 0,51 | 0,00 | 1,02 | 1,02 |

Table 2

**Agricultural diversification (in plant production and animal husbandry) of medium-sized farms in the Northern Plains region in 2000**

(Number of farms involved in the given activity as a percentage of the total number of farms in the microregion)

| SAPARD kistérségek | Alternative | | Organic farming | | | |
|---|---|---|---|---|---|---|
| | Plant produc-tion | Animal species | In plant production | In animal husbandry | Farms under conversion | Farms intending to conversion |
| **Bihar** | 0,28 | 3,89 | 0,06 | 0,04 | 0,11 | 0,65 |
| **Debrecen Agglomeration** | 0,84 | 4,26 | 0,09 | 0,04 | 0,12 | 0,89 |
| **Derecske** | 0,70 | 5,91 | 0,21 | 0,04 | 0,11 | 0,60 |
| **Hajdúnánási** | 0,20 | 1,94 | 0,04 | 0,02 | 0,08 | 1,09 |
| **Association of Hajdú Towns** | 0,31 | 3,52 | 0,13 | 0,32 | 0,27 | 1,11 |
| **Kismörösmenti** | 0,23 | 2,83 | 0,00 | 0,00 | 0,00 | 0,11 |
| **Sárrét** | 0,05 | 5,04 | 0,16 | 0,09 | 0,41 | 1,15 |
| **Tiszamenti** | 0,54 | 4,37 | 0,11 | 0,09 | 0,12 | 0,67 |
| **Jászság** | 4,28 | 3,60 | 0,07 | 0,04 | 0,09 | 1,07 |
| **Karcag** | 0,16 | 4,64 | 0,15 | 0,03 | 0,09 | 1,73 |
| **Mid-Tisza Region** | 0,48 | 5,27 | 0,12 | 0,03 | 0,14 | 1,05 |
| **Szolnok** | 1,08 | 5,49 | 0,07 | 0,06 | 0,14 | 1,11 |
| **Tiszahát** | 0,25 | 5,62 | 0,10 | 0,10 | 0,05 | 0,50 |
| **Tiszazug** | 4,76 | 4,08 | 0,06 | 0,00 | 0,06 | 0,36 |
| **Törökszentmiklós** | 0,33 | 5,35 | 0,12 | 0,07 | 0,15 | 0,67 |
| **Bereg** | 0,11 | 3,90 | 0,24 | 0,06 | 0,12 | 1,40 |
| **Csenger** | 0,14 | 3,19 | 0,05 | 0,00 | 0,63 | 1,83 |
| **South Nyírség** | 2,09 | 3,05 | 0,01 | 0,00 | 0,01 | 0,13 |
| **South-East Nyírség** | 0,77 | 4,69 | 0,01 | 0,00 | 0,05 | 0,26 |
| **First Nyírség** | 1,60 | 3,35 | 0,06 | 0,03 | 0,11 | 1,12 |
| **First Szabolcs** | 0,36 | 3,67 | 0,00 | 0,00 | 0,00 | 0,45 |
| **Upper Dada** | 1,05 | 3,05 | 0,04 | 0,00 | 0,00 | 0,45 |
| **Upper Szabolcs** | 0,33 | 3,88 | 0,14 | 0,03 | 0,08 | 2,18 |
| **Upper Tiszavidék** | 0,18 | 6,28 | 0,02 | 0,08 | 0,10 | 0,76 |
| **Central Nyírség** | 1,11 | 4,71 | 0,02 | 0,02 | 0,07 | 0,52 |
| **Rétköz** | 0,69 | 4,68 | 0,02 | 0,00 | 0,03 | 1,06 |
| **Szatmár** | 0,51 | 3,71 | 0,02 | 0,03 | 0,14 | 1,23 |
| **Túrmellék-Erdőhát** | 1,16 | 4,43 | 0,13 | 0,00 | 0,13 | 0,58 |
| **Non-classified settlements** | 0,53 | 2,79 | 0,00 | 0,00 | 0,06 | 0,79 |

Farms with 10.1-300 hectares of land were regarded as middle-sized. Even at first glance it is obvious that different activities, practised to different extents, are characteristic of each microregion.

*Trading, transportation and the other non-agricultural activities* are present in almost all regions, playing a decisive role in the farm diversification of the region. There are substantial differences, however, in the proportion of each. In the microregion close to the city of Debrecen, *trading* is characteristic on over 4 % of the farms, while in the Bihar microregion, which is in a remote location, this proportion is less than 1 %. In the case of transportation, the highest values (between 3 and 6 %) were recorded in microregions in the

neighbourhood of Nyiregyháza and the Ukrainian border. Activities included in the *other non-agricultural activities* category are fairly evenly distributed. The highest values (between 2 and 3 %) were found in the Sárrét region, which is well-diversified, and in the most eastern county of Hungary (Szabolcs-Szatmár-Bereg).

*Meat processing* is characteristic of four microregions. In villages of Tiszamenti microregion every 25th farmer is involved in this activity. In the other three microregions the ratio is below 1 %.

A fairly large volume of *milk processing* is carried out in a third of the microregions. The highest ratio was recorded in the Jászság microregion, where the standard of agriculture is high, and in the Derecske microregion near the city of Debrecen.

With respect to the number of alternative animal species examined, *livestock farming* in the microregions was much better diversified than crop production. This can be attributed largely to the fact that over the last decade traditional livestock farming was less profitable in Hungary than crop production. Farmers responded by radically reducing stocks of cattle and sheep and turning to breeding alternative animal species.

Some form of *organic farming* could be found in all the microregions. It is clear, however, that this form of farming is more widespread in crop production than in livestock farming. The market is the main reason for this. The rapid development of organic farming has only been witnessed in Hungary over the last five years. The prospects are indicated by the relatively high proportion of farmers who expressed their intention to go over to organic farming.

2.  For comprehensive analysis of the various activities, a new parameter, the aggregated, non-agricultural diversification index was elaborated and applied. The number of farms involved in each non-agricultural activity in each farm group and in the SAPARD microregion as a whole were added up and the value obtained was divided by the total number of farms in the given group. This can be expressed as:

$$\frac{\sum_{i=1}^{n} A_i}{\sum F}$$

where    A = the given non-agricultural activity

i...n = the frequency of the activity within the group

F = the number of farms in the group

In this way a simple, a user friendly value is obtained for the ratio of farms whose profile is becoming diversified. The index gives a slightly distorted picture, in that several activities may be carried out at the same time, especially on larger farms. (Since 10 non-agricultural activities were analysed, the maximum value of the index would be 1,000 %) It is important to note, however, that these parameters primarily express frequency and do not reflect the weight of the various activities in farm performance. Experience shows, however, that this distortion is not great enough to put into question the usefulness of the index.. The values obtained for the index are presented in Table 3.

Table 3

**Value of the non-agricultural diversification index in the microregions and farm size categories examined (%)**

| SAPARD microregion | Total land area available to the farm | | | | Total |
|---|---|---|---|---|---|
| | ≤10 hectares | 10.1-50 hectares | 50.1-100 hectares | 100.1-300 hectares | |
| **Bihar** | 1,15 | 2,76 | 6,56 | 16,28 | 1,34 |
| **Debrecen Agglomeration** | 4,37 | 10,20 | 19,66 | 44,74 | 4,73 |
| **Derecske** | 10,49 | 19,80 | 38,46 | 14,29 | 11,29 |
| **Hajdúnánási** | 1,12 | 3,17 | 5,13 | 11,76 | 1,34 |
| **Association of Hajdú Towns** | 3,99 | 8,63 | 29,17 | 50,00 | 4,48 |
| **Kismörösmenti** | 1,91 | 6,06 | 0,00 | 0,00 | 2,06 |
| **Sárrét** | 2,51 | 12,21 | 13,79 | 130,77 | 3,38 |
| **Tiszamenti** | 3,73 | 9,68 | 6,98 | 11,11 | 4,14 |
| **Jászság** | 3,57 | 12,93 | 14,47 | 31,58 | 4,22 |
| **Karcag** | 2,00 | 7,14 | 13,68 | 23,08 | 2,48 |
| **Mid-Tisza Region** | 1,88 | 4,66 | 5,88 | 48,48 | 2,37 |
| **Szolnok** | 2,83 | 8,33 | 8,96 | 26,92 | 3,38 |
| **Tiszahát** | 0,56 | 5,68 | 7,69 | 0,00 | 1,11 |
| **Tiszazug** | 4,75 | 9,75 | 3,03 | 64,71 | 5,12 |
| **Törökszentmiklós** | 1,55 | 7,82 | 8,00 | 50,00 | 2,02 |
| **Bereg** | 0,51 | 4,88 | 15,09 | 26,32 | 0,94 |
| **Csenger** | 0,62 | 1,64 | 14,29 | 0,00 | 0,74 |
| **South Nyírség** | 0,27 | 7,92 | 4,55 | 35,71 | 0,62 |
| **South-East Nyírség** | 0,57 | 5,04 | 13,56 | 33,33 | 0,95 |
| **First Nyírség** | 0,87 | 5,94 | 26,15 | 95,00 | 1,22 |
| **First Szabolcs** | 0,29 | 2,08 | 0,00 | … | 0,36 |
| **Upper Dada** | 0,87 | 6,50 | 6,25 | 53,33 | 1,36 |
| **Upper Szabolcs** | 0,38 | 4,32 | 0,00 | 57,14 | 0,64 |
| **Upper Tiszavidék** | 1,33 | 7,38 | 26,67 | 36,36 | 2,05 |
| **Central Nyírség** | 0,39 | 2,44 | 0,00 | 125,00 | 0,65 |
| **Rétköz** | 0,89 | 9,96 | 28,57 | 175,00 | 1,43 |
| **Szatmár** | 0,69 | 5,65 | 16,36 | 29,41 | 1,04 |
| **Túrmellék-Erdőhát** | 0,71 | 6,03 | 0,00 | 50,00 | 1,23 |
| **Non-classified settlements** | 0,56 | 4,04 | 25,00 | 40,00 | 0,82 |

It would be logical to conclude that one way in which small farms could adjust to the new economic situation would be to initiate or extend non-agricultural activities. In this way the farms could counterbalance the negative effects of their restricted land area on growth and profitability. Unfortunately, farms in most of the microregions in the Northern Great Plain region are not following this path.

The greatest values of diversification were found in the group of farms with more than 100 hectares of land, where values of over 100 were found, indicating that in the majority of farms belonging to the group, several types of non-agricultural activities are to be found.

The combined diversification indexes for each SAPARD microregion exhibited a very varied picture. It is typical of the region, however, that microregions with the highest diversification indexes were located in the central or western parts of the macroregion, while an index of below 1 % was chiefly recorded in the eastern areas.

3. An analysis was also made of the raw material supplies available for the various activities, and the proportion of farms which used exclusively raw material they had produced themselves for milk and meat processing, mixed fodder production and vegetable or fruit processing was found to be high. This is natural on farms with a land area of less than 10 hectares, but it can hardly be considered natural on 55 % of farms in the >50-hectare category. This indicates that in the North Plains area the processing plants are small, regional co-operation is underdeveloped, and the effects of farm diversification are felt chiefly within the farm.

4. The added value index per capita (as objective variable) and taxable income per capita were calculated for each community. The former was taken as an indicator of regional performance and the latter as an indicator of personal income. Principal component analysis was employed to determine how the regional performance index and the personal income index were correlated with major agricultural parameters. The results are presented in Table 4.

Table 4

**Interrelationships between regional economic performance, incomes and agricultural variables significantly related to them in the Northern Plains region**

| Variables | Principal components | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| The available added value index per capita (objective variable) | 0,45 | 0,58 | n.s. | 0,41 | n.s. |
| Ratio of commodity-producing farms of more than 50 hectares | 0,83 | n.s. | n.s. | n.s. | n.s. |
| Agricultural area per capita | 0,79 | n.s. | n.s. | n.s. | n.s. |
| Agricultural area per farm | 0,75 | n.s. | n.s. | n.s. | n.s. |
| Taxable income per capita | 0,50 | 0,59 | n.s. | 0,37 | n.s. |
| Ratio of farm employees with secondary or higher qualifications | 0,44 | n.s. | 0,37 | n.s. | n.s. |
| Aggregated index of non-agricultural diversification | 0,40 | n.s. | n.s. | n.s. | n.s. |
| Mean quality of the arable land in gold crown value | 0,34 | 0,59 | 0,40 | n.s. | n.s. |
| Stocking rate | n.s. | 0,63 | n.s. | n.s. | n.s. |
| Ratio of land sown to cereals | n.s. | 0,49 | 0,32 | n.s. | n.s. |
| Ratio of agricultural land | 0,38 | 0,34 | 0,49 | n.s. | n.s. |
| Cumulative eigenvalue ($\lambda$) | 20,5 | 34,9 | 44,7 | 54,0 | 60,9 |

n.s.= non significant

The numbers given in the tables represent principal component loadings, which were calculated from mean settlement data.

Significant correlation was found for the following factors:
- ratio of commodity-producing farms of more than 50 hectares;
- agricultural area per capita and per farm;
- ratio of farm employees with secondary or higher qualifications;
- number of animals per arable hectare and grassland;
- mean quality of the arable in gold crown value;
- taxable income per capita;
- amount of livestock;
- ratio of land sown to cereals;
- ratio of agricultural land;
- aggregated index of non-agricultural diversification.

The principal component weightings also express the relationship between the variables and the principal components, in other words, the extent to which the given variable contributes to the variance of the individual principal components. Several large weightings are found in both the first and the second principal component, indicating that the variables are closely related to each other and also correlate as a group. In the case of the first principal component it can be seen that the objective variable is closely correlated with eight other variables, including the aggregated index of non-agricultural diversification. It can also be seen, however, that non-agricultural diversification is greatest in areas where the ratio of farms larger than 50 hectares is higher, where the human resources are more highly developed, and where land area per farm and per farm worker is higher. This latter is probably due to the fact that there is a high proportion of farm-produced raw material utilisation and on smaller farms a major part of the agricultural product processing serves on-farm purposes. The mean quality of the arable in gold crown value, on the other hand, suggests that the reorganisation of non-agricultural activities is not concentrated on less favoured areas.

## Conclusions

1.  Farm diversification, which has now reached almost all large farms in Hungary, began somewhat earlier here than in the Western European countries, and the functioning, economic environment and forms of this diversification bore little resemblance to the processes taking place in the West. However, this earlier development, which was successful in many respects, came to a halt in the late eighties. Over the last ten years new forms of diversification have evolved in a new economic environment with new farm structures.

2.  By 2000 various forms of non-agricultural and agricultural diversification reappeared in farms in the SAPARD microregions of the North Plains area. However, the ratio of non-agricultural activities is still modest, both as compared with the mid-eighties in Hungary and with the figures recorded in EU member states. The positive effects of non-agricultural farm diversification can already be felt, however, in regional performance and personal incomes.

3.  The number of people employed in agriculture exhibits a constant decline. Rural communities have low population retention ability. The land area per capita is substantially higher in large farms than in smaller ones. This means that, as the result of farm concentration, there are likely to be further staff reductions. Farm diversification could be one way of finding employment for these people in their own communities.

4.  These studies drew attention to regional differences, co-operational difficulties and the small size of processing plants, and also to agricultural factors closely related to farm diversification. Among these, special mention should be made of farm size, the land area per capita, the ratio of highly qualified staff, the quality of the land, and the ability of the farm to produce added value. There has been a noteworthy increase in organic farming and many farmers have expressed interest in this possibility.

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# A few aspects of capital-effectiveness of agricultural assets

István Takács[19]

## Abstract

For 12 years since the change in Hungary's economic system, the country fell further behind European countries with developed agriculture. The sector's technical development has come to a standstill. The stock of assets, run with high exploitation indices compared to international standards, which are based on a large-scale farm structure, is not adequate for the new farm structure. The investment subsidies increased the stock of agricultural assets and decreased the shortage of capacities but they created local capacity surplus. At the same time, the worn-out and obsolete machines with high operational costs have not been withdrawn, thus the average age of the machinery has increrased. This article is about a few agro-economic aspects concerning asset-effectiveness one key element of technical development: mechanization. (The research was supported by an OTKA theme No. T037519.)

### Key words

technical development, mechanization, capital effectiveness, degree of supply with assets

## Introduction

The Hungarian agriculture's technical development discontinued during the 90's. The long-term development program started with a period dominated by Imre Dimény in the 70s, which made it possible to form an agro-economy with high technical-technological level in the Central-Eastern European area. Based on international technical development trends, the development of biological basics, the chemicalization and professional technological know-how in one system, which has served the creation of a modern and competitive agriculture.

The pool of assets shows mixed aspects concerning moderness and technical level: in Western Europe and North America machines represented the cutting edge of agricultural technology, to which the domestic agricultural machine industry has more or less caught up but the major part of the stock represented a lower technical level, which originated in Eastern Europe. The powerful machines were used on large (even on several hectares) plots with modern work organization methods. As a consequence of this, the average exploitation of power and working machines was high, while their number per field unit was low, according to international ranking.

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The large-scale system of assets created in the 70s and 80s could not effectively and economically serve farm and field sizes, which produced poor results following the change in economic system in the 90s. Efficiency decreases when large-scale machines are used on smaller plots. At the same time the pace of investments does not reach that of earlier decades and meet the needs of transformed farm structure. The real value of the asset investments in the 90s did not reach its earlier level, so the growth of stock could not meet the needs of capacity surplus caused by the change of production methods and the loss of old assets. Because of the increase of capacity need, the obsolete and worn-out machines continued to be kept in use. So both factors resulted in the ageing of machinery. According to the research of Hajdú et al. [1996], the average age of tractors was 9.8 years in the middle of the 90s. On the basis of the figures of the General Agricultural Census (GAC) in 2000, the average age of the tractors grew to 14.9 years by 2000. In the case of private farmers, this number was even less favourable: 16.4 years. The average age of the other assets was also between 13 and 17 years. [The agriculture's machines and buildings 1991-2000.] (Table 1)

Table 1

**The age of some typical agricultural assets**

| Description | Estimated average age (yr) | | | |
| --- | --- | --- | --- | --- |
| | According to FMMI's survey of 1996[a] | According to GAC 2000 | | |
| | | Private farm | Business association | Total farms |
| Tractors | 9.8 | 16.4 | 11.7 | 14.9 |
| Harvesters-threshers | 8.9 | 18.3 | 11.5 | 14.5 |
| Trucks | 8.7 | 11.9 | 12.4 | 12.1 |
| Trailers | 12.5 | 15.9 | 16.1 | 16.0 |
| Soil cultivators | 9.3 | 13.8 | 12.3 | 13.5 |
| Seeders | 9.4 | 13.7 | 11.5 | 13.2 |
| Seed dryers | 14.5 | 16.5 | 13.8 | 16.4 |

Source:     [a] Hajdú et al., 1996a
              [b] The machines and buildings of the agriculture 1991-2000. 56. p.

The traditions of machine usage have changed in small and middle farms. The assets are often kept in use after the economic optimum, which makes the costs of instalments and repairs rise, causing the per-unit operation costs to exceed the operation costs of a new machine. One explanation for this is also based on the farms' machine-degree of supply. (Table 2) The „inherited" stocks of assets were not able to serve the new farm structure formed after the change of economic system. On one hand, there are not enough machines; on the other hand the large-scale plots often cannot properly meet the technological requirements of the small plots. A capacity surplus and a shortage of capacity occurred at the same time.

Table 2

**The degree of supply with machines and assets per one farm**

| Description | Unit | Total farms | Farming types | |
|---|---|---|---|---|
| | | | Private farm | Business association |
| Tractors totally | piece/farm | 0.16 | 0.11 | 5.08 |
| Out of it:　− 20 kW | piece/farm | 0.03 | 0.03 | 0.27 |
| 21 − 60 kW | piece/farm | 0.10 | 0.07 | 3.25 |
| 61 − kW | piece/farm | 0.03 | 0.01 | 1.56 |
| Combine | piece/farm | 0.02 | 0.01 | 1.05 |
| Plough | piece/farm | 0.09 | 0.08 | 1.69 |
| Truck | ton/farm | 0.14 | 0.05 | 9.83 |

Source: Hungary's agriculture in 2000; private counting

Only a small proportion of private farms (mostly small farms) have machines, so they have to hire them where machines are needed. This would be a rational way to save money, but those who have their own machines, cannot run the machines effectively, which makes the per-unit operation costs increase.

One explanation for the capacity surplus is that small farms have a higher need of capacity than larger farms because of technological, organizational and psychological reasons. This is supported by both old [Farkas, 1945] and present experience.

While the age of combined assets also refers to its technical state and technological level, the appreciable assets' places of origin also provide information. According to GAC's survey in 2000, 80.9% of the tractors (87.9% of those produced domestically) are Eastern European out of which 93.2% (95.1% of the domestic ones) of 41-60 kW tractors that are the most frequently used, come from this region. The situation of major – the combine-harvester – is relatively more favourable, since „only" 51.3% is are Eastern European. As for the transportation machines, 69.8% of the trucks were made in Eastern Europe, more than half of them were produced in the former German Democratic Republic, which has not existed for 10 years.

The investments, induced by the shortage of machines, do not follow the trends of countries with developed agriculture, as outdated smaller machines with inferior technology are often found. Usually more obsolete machines with lower technical conditions can be found. [Hajdú et al. 1996b] Because of lack of funding and the uncreditworthy farmers, the purchase of cheap technically inferior machines spread quickly, rather than modern assets with superior technology. This practise was also bolstered by subsidies.

The above figures indicate a crying need for investment capital. If we take only the degree of supply of power-machines, we can see that there is one tractor for 10 private farmers. [Hungary's agriculture in 2000] We can find similar rates in the case of the other assets. Of course every micro-farm doesn't have to own the necessary assets, but at the same time those figures indicate a distinct lack of capital.

On the basis of all this, making Hungarian agriculture competitive depends on whether technical development is feasible, and at the same time if associations, organizations

could be established that provide the effective utilization of capital, immobilized in the assets.

The basis of the general presentation for agricultural farms was provided by the Research and Information Institute for Agricultural Economics' (AKII) processed data on test farms. The results of the investigations are presented in details by [Kovács G. and Keszthelyi Sz., 2000.]. According to their investigations, the income conditions of agricultural enterprises is differed. The profitability of private farmers is usually higher than larger business associations, especially than the cooperatives, while on many private farms the volume of production value does not reach the level a family can live on.

The survey of Alvincz J. and Varga T. [2000] also supports this, as it states that in 43% of the farms, which they studied, more than 50% of their income comes from agriculture, so the higher proportion of income comes from other activities, which also holds true for those who say that they are full-time agricultural workers.

The income position of farmers is bolstered by state subsidies. But if we talk about the role of the government, we have to mention the long-lasting uncertainty in land-policy. One of the AKII's studies states that the uncertainty is a consequence of the „model crisis" even caused delays for farmers with capital. It is partly the reason for the delay of modernization and capital inflow (also causing income to lower) and it is also related to the overly high rate of land dispersal. [Udovecz G. et al. 2000]

In the EU, the unit of long-lasting income-producing ability is the ESU (1 ESU is equal to 1200 euro standard break-even contribution), where the annual income-producing ability of farms of the smallest category is a maximum 2 ESU, which amounts to approximately 550-600,000 HUF. According to the AKII's calculations, 90% of Hungarian farms can be put into this category – taking into account their own consumption. Research based on partical experience shows that – on the basis of also the practical experience – because of low profit, only farms that are 4- to 6 times bigger could provide a living. On a farm like this, there should be 30-50 milking cows or 300-400 pens for pigs (their output is 1000 pigs annually), 4-5 hectares of orchards or at least 100 hectares of crop.

Only a few thousand (50-60.000) farms (5-6% of the total number) belong to this group in Hungary. [Alvincz – Varga, 2000; Udovecz et al., 2000.]

So the answers should be found to the following questions:
- What does capital-effectiveness look like on agricultural farms?
- What differences can be observed concerning the technical level in different areas in Hungary?

The answer to these questions, plus the regional capacity and supply regarding major farm machinery, as well as an evaluation of regional differences, are presented. Based on the statistical survey, the technical level of private farms seems to be critical; based on farm figures in Central Hungary the degree of supply with assets and the capital-effectiveness of the assets on producing private farms are presented.

Regarding technical development, it is important how to allocate resources for production depending on farm size.

## Material and method

Dimény says „… technical development is an activity that positively influences the economic indices by bringing to perfection the production assets and the procedures… The technical development of agriculture – by a simplification – is based on 4 pillars. These are the biological, chemical, technical and the human factors' … Technics … also include the elements of mechanization and architecture." [Dimény, 1975. 53. p.] According to this classic definition one of the important pillars of technical development is mechanization. The examination of agriculture's technical level was done on the basis of the figures of the General Agricultural Census (GAC) carried out in 2000 by the Central Statistical Office (CSO). Thus the examination was based on secondary figures. The CSO collected data about tractors, combine-harvesters, trucks under 20 kW, between 21-60 kW and over 60 kW. For reasons of length, this study only details the frequency of tractors relating to the key elements of agriculture. Low extent of assets on small farms, the frequency of tractors there was also examined on farms between 10 and 50 hectares.

In this case, on the basis of the number of assets compared to number of farms over the criteria size, the abundance of assets of the farms in general can be estimated. The regional inequalities between the statistical regions can be examined with the help of the dual index.

The CSO's survey covered all the agricultural farms, but the figures provide opportunity only for limited investigations. More established relationships and consequences can only be drawn from the survey on test-farms, carried out by the Research and Information Institute for Agricultural Economics (AKII). In the analysis, the data of years 1999 and 2000 are applied. The Institute did examinations on samples of 1300 members in 1999, and of 1670 in 2000. In the sample, obtained in 1999, 46.3% of the farms were run by private farmers, 33.8% sole proprietor, 9.5% business association (partnership, Ltd.), 7.7% cooperative, 2.7% aggregated farm. [Kovács – Keszthelyi, 2000.]. These proportions changed a bit in 2000 and 2001. [Keszthelyi – Kovács, 2002.].

The surveys' data were complemented with further questions regarding the level of usage of utility equipments. The surveys were collected by one of the partners of the AKII, TRENDCOOP Ltd. Beside the AKII's questionnaire, the farmers answered questions on their the number of assets. [Kovács – Takács, 2002]

5 groups were formed in the sample: farms under 30 hectares, between 30-60 hectares, between 60-100 hectares and 100-200 hectares, and over 200 hectares. The sample included farmers who did mainly crop production, so the composition of the machinery depended primarily on this activity. The data of 102 farms in Komárom-Esztergom, Pest and Heves counties were applied. The data refer to the year 2000. The farms were randomly chosen from the sample out of 300 test farms from the different groups.

The age of the machines on the farms was estimated. This was because exact and reliable data were not available in every case. The estimated age of the machines can be defined with the following index on the basis of the data provided in the survey (at the interviews, or data from accounting. The coherence, related to age estimation is:

$$N = \log_a \frac{P}{P_0} \text{, in which}$$

N = estimated age [year]

a = the index of average price changes of the agricultural machines

P = the cost of the replacement of the machine [HUF]

$P_0$ = the historical cost of the machine [HUF]

## Results

Effectiveness in general means the relationship of an output (yield) and input (expenditure). It shows how how much yield can be obtained from a unit of expenditure. Measuring the effectiveness and comparing it to that of the competitors is inevitable in defining our position of competitiveness. One of the Hungarian agriculture's weak points compared to the inadequate technical level. (Although this can be an advantage against competition under appropriate conditions. It will be detailed later.)

In this article the number of tractors, which primarily determines the farms' technical potential is emphasized. The frequency of tractors (Table 3) shows a ambivalent picture because of the different economic structure of regions. The capacity-supply reflects also the economic polarization of the country. Western, Central, and Southern Transdanubia have the most favourable position. Northern Hungary is lagging behind, but concerning certain indices the Northern Great Plain also shows an unfavourable picture. On the basis of the average performance index of tractors, we can draw conclusions on the machine-investments of the last decade. The Southern Great Plain was very active in the machine-investments, which were supported by the state. The amount of agriculture in this region exceeds the national average. In Northern Hungary the inherited large-scale pool of machines dominates, indicating that in this region the volume of agricultural investment was low. (This is also proved by investigations of the Technical Institute of the Ministry of Agriculture and Rural Development.)

Table 3

**The regional characteristics of the tractor degree of supply with private farms**

| Statistical regions | Specific number of tractors | | | Specific performance | | Average performance of tractor engines |
|---|---|---|---|---|---|---|
| | Total farms | Over 50 hectares | Over 10 hectares | Over 50 hectares | Over 10 hectares | |
| | (pc/farm) | | | (kW/farm) | | (kW) |
| Central-Hungary | 0.12 | 14.9 | 2.3 | 799.2 | 120.6 | 53.5 |
| Cental-Transdanubia | 0.14 | 13.8 | 2.4 | 707.8 | 124.9 | 51.5 |
| Western-Transdanubia | 0.17 | 29.1 | 3.6 | 1518.5 | 188.3 | 52.1 |
| Southern-Transdanubia | 0.12 | 15.3 | 2.5 | 822.8 | 133.6 | 53.7 |
| Northern-Hungary | 0.09 | 12.5 | 2.1 | 700.2 | 118.7 | 55.9 |
| Northern-Great Plain | 0.12 | 13.6 | 1.7 | 762.0 | 97.5 | 56.2 |
| Southern-Great Plain | 0.16 | 16.3 | 2.0 | 937.0 | 114.8 | 57.5 |
| Total: | 0.13 | 15.5 | 2.2 | 851.3 | 120.9 | 55.0 |

Source: Hungary's agriculture in 2000, private counting

It is interesting to examine the frequency of tractors on farms of 10 or 50 hectares. (One tractor of 50-60 kW can serve 100-250 hectares depending on the production structure. [Takácsné György K., 1995.]) Because of the low number of farms in this category, the frequency of tractors is provided. Major differences are observed among farms over 50 hectares in Central Hungary and Western Transdanubia. The differences within the statistical regions (Table 4) show a relative homogeneity compared to the national average, since the difference between the extreme values of the latter is mostly much higher than the dual-value of any regions.

Table 4

**Dual indices of extreme values within the region (maximum/minimum rate)**

| Statistical regions | Specific number of tractors | | | Specific performance | | Average performance of tractor engines |
|---|---|---|---|---|---|---|
| | Total farms | Over 50 hectares | Over 10 hectares | Over 50 hectares | Over 10 hectares | |
| | (pc/farm) | | | (kW/farm) | | (kW) |
| Central-Hungary | 3.6 | 23.2 | 8.9 | 26.6 | 7.5 | 1.6 |
| Cental-Transdanubia | 2.8 | 8.4 | 6.1 | 8.5 | 4.9 | 1.7 |
| Western-Transdanubia | 3.2 | 10.6 | 4.0 | 9.8 | 3.6 | 1.4 |
| Southern-Transdanubia | 3.7 | 5.1 | 4.2 | 4.0 | 3.6 | 1.5 |
| Northern-Hungary | 6.6 | 3.1 | 2.3 | 3.3 | 1.7 | 1.4 |
| Northern-Great Plain | 8.7 | 9.1 | 4.5 | 7.8 | 3.8 | 1.5 |
| Southern-Great Plain | 3.3 | 7.6 | 3.6 | 6.9 | 3.2 | 1.2 |
| Total: | 12.4 | 33.8 | 11.4 | 36.3 | 12.3 | 1.8 |

Source: Hungary's agriculture in 2000, private counting

Komárom-Esztergom, Pest and Heves counties should separated from the national data, because further examinations could be carried out on the level of assets on private farms in these places. These counties belong to 3 statistical regions. The frequency of tractors in the counties varies.

Pest county lags behind the national average, as does Central Hungary, as does Heves county compared to Northern Hungary. In the latter case, tractors are more abundant than the national average (52% more). But if we examine what the frequency of tractors like in the case of larger farms (over 10 and 50 hectares), we can see that in this economic group the supply is considered satisfactory (Table 5).

Table 5

**The degree of supply with tractors in the counties of Central-Hungary**

| Territorial unit | Farms for one tractor | The difference form the national average | Total number of tractors on private farms | Number of farms over 50 he | Average size of farms over 50 he | Number of farms over 10 he | Average size of farms over 10 he | Number of private farms according to farm size |
|---|---|---|---|---|---|---|---|---|
| | (pc/pc) | - | (pc) | (pc) | (he) | (pc) | (he) | (pc) |
| Pest | 8.4 | -0.8 | 6996 | 399 | 133.9 | 2753 | 37.5 | 51781 |
| Central-Hungary | 8.3 | -0.6 | 7518 | 503 | 133.0 | 3334 | 39.3 | 55518 |
| Komárom-Esztergom | 7.3 | 0.4 | 2011 | 144 | 114.5 | 847 | 37.7 | 14475 |
| Central-Transdanubia | 7.0 | 0.6 | 10248 | 745 | 124.8 | 4221 | 39.9 | 72612 |
| Heves | 8.9 | -1.2 | 3346 | 244 | 121.2 | 1609 | 36.5 | 28966 |
| Northern-Hungary | 11.7 | -4.0 | 10114 | 808 | 119.7 | 4767 | 38.7 | 102549 |
| Total: | 7.7 | 0.0 | 109788 | 7093 | 113.7 | 49940 | 34.5 | 743127 |

Source: Hungary's agriculture in 2000. CSO. 2001.

In the following countries many private farms do not have tractors: Pest county 44 800; Komárom-Esztergom 12 500; Heves county 25 600. Thus these farms do not reach 100% capacity. But on the farms with tractors there is capacity surplus. Taking into account that – depending on the production structure – a tractor with 60 kW performance can serve at least 100-150 hectares, the average capacity surplus on farms over 10 hectares is 71.2% nationally, and it ranges between 68.6 and 69.6% in the examined counties. The difference is not significant, but from a capital-effectiveness point of view the position of the 3 counties is more favourable than the national average. For the total number of farms the situation is getting worse. The average capacity surplus nationally is 77.6%, and it ranges between 77.1 and 81.5% in the examined counties.

The relative position between the statistically small regions and the bigger regions (the difference between the indices of the most favourable and the least favourable areas) shows differences in the counties. While some small regions show 1.8-3.6 times higher figures concerning the number of farms with one tractor, the number of farms over 50 hectares shows 1.4-4.1 higher differences concerning farm sizes. (Table 6) These data refer to the difference in exploitation of the existing capacity in the counties.

Table 6

**The rate of the maximum and the minimum value in the region (dual index)**

| Territorial unit | Farms for one tractor | Average size of farms over 50 he | Average size of farms over 10 he | Number of private farms according to farm size |
|---|---|---|---|---|
| Pest | 3.6 | 4.1 | 2.6 | 2.6 |
| Central-Hungary | 3.6 | 4.1 | 2.6 | 2.6 |
| Komárom-Esztergom | 1.8 | 1.4 | 1.6 | 1.6 |
| Central-Transdanubia | 2.8 | 1.7 | 2.0 | 2.0 |
| Heves | 3.6 | 1.5 | 1.4 | 1.4 |
| Northern-Hungary | 6.6 | 2.0 | 1.7 | 1.7 |
| Total: | 12.4 | 5.2 | 2.8 | 2.8 |

Source: Hungary's agriculture in 2000. On the basis of CSO 2001, private counting

Examining the exploitation of the engaged capital on the basis of the test farms' data, on the farms examined in the 3 counties there were 211 tractors, whose historical cost was (depending on the types) 76% of the replacement cost, which shows that obsolete machines were purchased. This creates a relatively more favourable situation from capital-effectiveness aspects, since it means the engagement of less (from accounting point of view) capital with the same nominal value of capacity. This index is 38% in the case of farms under 30 hectares, while 50% in the case of farms between 30 and 60 hectares.

The capital value of 1 kW performance ranges according to this. The large-scale farms are in the most favourable situation. Out of the counties Komárom-Esztergom is in a favourable position. The capacity-exploitation shows a similar tendency (Table 7).

Table 7

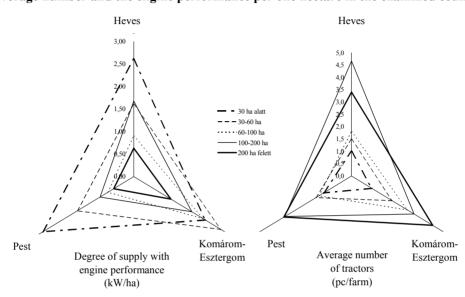**The capital value of 1 kW engine performance and the estimated value of capacity exploitation**

| County | Under 30 he | 30,1-60 he | 60,1-100 he | 100,1-200 he | Over 200 he | Total |
|---|---|---|---|---|---|---|
| **The value of capital engaged in 1 kW engine performance (HUF/kW)** | | | | | | |
| Heves | 15542 | 18889 | 20816 | 31696 | 68242 | 38319 |
| Komárom-Esztergom | 16667 | 38932 | 47353 | 49649 | 44463 | 46074 |
| Pest | 21469 | 20361 | 10906 | 19846 | 44236 | 30515 |
| Average | 18956 | 25140 | 31440 | 39195 | 50528 | 38113 |
| **Estimated exploitation of capacity (%)** | | | | | | |
| Heves | 25 | 33 | 60 | 26 | 78 | 49 |
| Komárom-Esztergom | 33 | 26 | 26 | 32 | 44 | 32 |
| Pest | 24 | 37 | 75 | 58 | 93 | 68 |
| Average | 26 | 33 | 47 | 38 | 82 | 50 |

Source: private collection of data

The low capacity exploitation of small farms causes significant problems in capital-effectiveness. It can be observed that capital-effectiveness is rising with the increase in farm-sizes, which results in the favourable change of the cost structure of the farm.

Asset-effectiveness can be defined as the engine-performance per land-unit, which is the most favourable on farms over 200 hectares (0.5-1 kW/hectares in the examines counties). (Figure 1)

**Average number and the engine performance per one hectare in the examined counties**



While in Komárom-Esztergom county the specific capacity-engagement is following the „expected" trend, on the examined farms of Heves and Pest counties it is lower on farms between 60-100 hectares, than the bigger farms between 100-200 hectares, so their exploitation of assets is higher/better.

The pool of assets was mostly based on 40-50 kW power machines among the examined farms. The number of tractors per one farm is 2.6/farm. The figures show very similar frequency of tractors in all the 3 counties (Table 8). Concerning farm-sizes the specific value is gradually increasing, except for the lowest category, in which the number of machines per one farm is higher than in the other 7 categories. At the same time it does not necessarily mean real capacity surplus, on the one hand because the machines are mainly from the lower performance categories (under 50 kW), on the other hand because their age exceeds the average. In the sample the estimated average age of the tractors is 11.3 years, 14.6 years on farms under 30 hectares. It is not better even in the category of 30-60 hectares, where the estimated average age is 15.5 years.

Table 8

**The estimated average number and age of tractors of the counties according to their age**

| Description | Average number | Average age |
|---|---|---|
| | **(pc/farm)** | **(year)** |
| Counties: | | |
| Heves | 2.62 | 11.4 |
| Komárom-Esztergom | 2.42 | 8.9 |
| Pest | 2.62 | 13.2 |
| Average of the counties | 2.56 | 11.3 |
| **Farm-size categories** | | |
| – 30 he | 2.29 | 14.6 |
| 30 – 60 he | 1.70 | 15.5 |
| 60 – 100 he | 2.00 | 11.8 |
| 100 – 200 he | 2.92 | 10.8 |
| 200 – he | 3.53 | 9.2 |
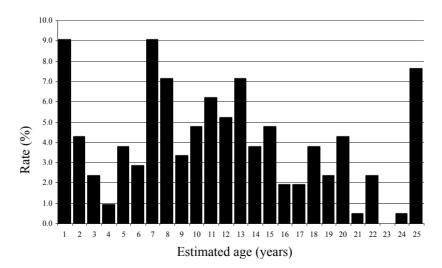
Source: private collection of data

Examining the age-distribution of the tractors (Figure 2) we can discover that investment subsidies were introduced in 1993-1994. Later the shrinking of subsidy sources in real value can be observed in the second half of the 90s. 1999 and 2000 show encouraging signs for development due to the increase of incentive sources.

Figure 2

**The distribution of tractors according to their estimated age on the observed farms in 2000**
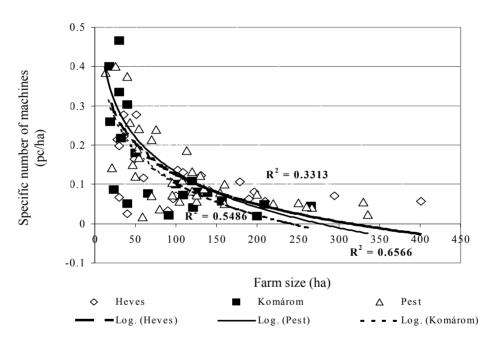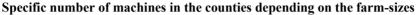


Through examining the farms it can be stated that the specific degree of supply with assets per land unit is higher or smaller. As a consequence of this, the unexploited capacity causes the increase of the cost of products and the need for a higher break-even threshold,

which cannot be accepted by the market. The result of the income decrease is that the enterprises are not able to accumulate capital appropriately, whose effects cannot be accomplished in the short term, but its long-term effects –in the European agricultural sector – mean disadvantages. The weak competitive position will be significant on farms with low capital.

The curve representing amount of supply (Figure 3) shows the same picture in all 3 counties, and significant differences cannot be detected between them. The frequency of supply seems to be balanced in size between 100-150 hectares, which is also justifiable from an agro-technical point of view. The graph shows low level in level of assets of supply on the smaller farms.

Figure 3

**Specific number of machines in the counties depending on the farm-sizes**



Be examining the data in detail, it can be stated that in their case the work by leased machinery was greater in proportion (above the average), an economically rational behaviour.

## Conclusions

A high technical level is a key element of competitiveness and on the other hand the inadequate utilization of capital, invested in assets, causes problems in effectiveness and profitability. The simplest examination of the level of assets on the agricultural farms can be through the examination key machinery. Tractors are also in a prominent position regarding development.

Through examining the amount of tractors in the country, we can state that larger farms may have the necessary heavy equipment, and they may even have significant capacity surplus. For efficient usage, mutual usage of machines can provide an adequate framework.

In the different parts of the country there are significant differences concerning the degree of supply and capacity which exceed even the regional differences and which can be equalized only with a conscious, systematic and comprehensive concept for technical development which covers the whole country, supported by the government and which is based on professional and scientific knowledge. The regions in Northern and Eastern Hungary have the most unfavourable position (based on the results of the detailed research).

To show the negative trends in the level of agricultural assets – on the basis of the data of GAC 2000 and the test farms – it is necessary to examine the problems of capital-effectiveness in the case of tractors, as expensive and key-machinery, we can state:

- The level of capacity of the small farms is not satisfactory. Most of the farms do not have – and from an economic point of view they do not need to have – a pool of heavy equipment. The current capacity needs can be met by appropriate management, by establishing virtual large-scale farms (partnerships and cooperatives for machine utilization).
- A small proportion of small farms have significant capacity surplus, which results in the low effectiveness of capital invested in assets. Under normal circumstances the sale of the capacity surplus (by providing services) results in considerable improvement in effectiveness.
- The level of sophistication and the technological level of assets and the quality of production are backward compared to the countries with developed agriculture, which have recently announced a new development program.

Investigations have proved that the capital-effectiveness of smaller farms is lower than that of the larger ones at present. Only a few farmers choose those methods which could improve the effectiveness of their capital, which are tied up in assets. The reasons for this – based on personal interviews – are subjective or factors that are due to distrust, and inadequacy, of farmers' associations. The concepts for economic growth should bear fruit for both the business and the national economy by supporting methods of capital-effectiveness.

Beside this, It is promising that in the past 2 years the need to renew the pool of assets grew, and this could halt the ageing of assets that worsens the competitiveness of domestic producers from both a technological and an economical point of view.

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# An examination of capital sructure of corporate agricultural enterprises in Heves county

## László Pataki[20]

### Abstract

In the past decade the capital status and structure of agricultural enterprises significantly changed. These changes had a profound effect on the other types of indices pertaining to the management of these enterprises. Of course there are regional deviations from the national trend. The objective of the present paper is to give a short review of the national situation by using the data of the summarised company tax declarations of APEH, the Hungarian tax authority, then by processing the database of a company model derived from the co-operating agricultural enterprises of Heves county I will try to explore the regional peculiarities. During data processing traditional statistical methods (relative numbers, averages, spread, median, quartiles) were used. The main conclusions of the examination: The self-financing ability of study participating agricultural enterprises was becoming worse and worse, which increased the enterprises' need for foreign capital. Foreign capital stressed long-term liabilities. Agricultural enterprises switched to the use of a conservative financing strategy, which, due to the special capital expense relations of the sector did not significantly raise the expenses of financing. Both the operating and the financial capital transfer increased in the sector , which made investment a bigger risk. The agricultural enterprises of Heves county, which were studied used less foreign capital when compared with the national average and within which the extent of credits was lower. The possibilities for self-financing are more limited than anywhere else in the country.

### Key words

agri-financing, capital structure, capital status, self-finanicing, capital transfer.

## Introduction and database

The political and economic change of the 1990s brought several significant changes in the capital structure and status of the agricultural enterprises.

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During my study the formation of capital status and structure of co-operating agricultural enterprises was evaluated between 1992 and 2000 together with the value changes of some indices pertaining to the management of these enterprises in relation to the formation of capital status. The summarised survey made of the company tax declarations handed in to APEH, which served as the database for the national study. Besides the national study the analysis was also carried out on a model company composed of 27 participating agricultural enterprises in Heves county. The annual data of the registering system of the Heves County Court of Registrar were used as a database. For the sake of representation, the following method was used while composing the model: the participating agricultural enterprises of Heves county were grouped on the basis of their main activity. Care was taken to ensure that the main activities of the participants proportionally matched those of other farm enterprises in Heves country.

The added value produced by the co-operatives and participating agricultural enterprises in Heves county together accounted for 3.08% of GDP in 1999 calculated in the same way as its national counterpart. (Central Statistical Office, CSO, 2001) The total gross added value produced by the enterprises of the model represented nearly 41 per cent of the data in the county in 1999.

Within the framework of this article the results of the studies carried out in Heves county are aimed at presenting the results of the national study only the basic processes are described highlight the regional differences

**The main changes in the capital status and situation of co-operating agricultural enterprises in Heves county between 1992-2000**

The deterioration of efficiency due to the because of a declining market (both inner and outer) relations, constant agricultural parity which is even bigger in certain years, the old state of equipment necessary for production and the lack of finances needed for their modernisation as well as the constantly higher expenses (e.g. the appearance of land lease) made the self-financing capacity of agricultural enterprises worse. The weakening of self-financing capacity increased the need for foreign capital on the part of enterprises.

Every enterprise has liabilities that must be dealt with, regardless of the enterprise's incomes or revenue. These liabilities raise the fluctuation of revenue, the instability of revenues. This risk-raising effect of constant liabilities is called leverage. Two types of leverage can be distinguished, as the liabilities can be related to both sides of the balance sheet. The leverage effect of constant expenses related to using assets (e.g. depreciation, insurance fees, rents) is called working leverage. The risk-raising effect of constant expenses related to liabilities (e.g. interest on loans) is called financial leverage.

If both types of leverage are used by an enterprise, the enterprise uses combined leverage.

The increase in the volume of constant expenses related to equipment made the operating capital transfer of agricultural enterprises even bigger. This increased the risk of agricultural ventures and the rise of combined capital transfer avails security of the registered capital greater.

In agriculture by the end of the decade the value of foreign capital approached the one of yhe domestic. Only some of the enterprises reached the critical point of creditworthiness and for them it is not possible to increase the ratio of foreign capital any further.

The structure of foreign capital according to its equation was also modified. The ratio of long term liabilities was also on the rise mainly from 1997 as an effect of credit construction to substitute for capital. The change in the inner structure of liabilities can only be possible by distributing subsidised medium and long-term loans.

Inside the short term liabilities – without considering the middle of the 1990s – the role of "compulsory creditors" (suppliers, state) is still significant. Parallel with the deteriorating creditworthiness the role of trade credits has become strong again in agriculture.

The increase in the ratio of long-term liabilities was not followed by the increase in the ratio of constant liabilities as the ratio of domestic decreased within the structure of liabilities.

Inside the operating funds the immobility and mainly the ratio of supplies increased in the examined period. In comparison with the short-term liabilities the greater value of operating funds often reflects "faint liquidity".

The proceeds of assets used in agriculture continuously lag behind the expenses of foreign capital. As a result, the profitability of private is low and lags behind the profitability of the total capital.

The role of amortisation became greater within cash-flow and the reason for this is the decrease of profit. As a result of the insufficient profit the level of investment activity primarily depends on state subsidies.

In the second half of the 1990s as a result of capital substituting credit agricultural enterprises started to employ conservative financing strategies which can be regarded as a careful but expensive strategy. (BORSZÉKI – SZÉLES 2001) As a result of the peculiar profitability relations of certain capital elements the application of this strategy in agriculture did not necessarily mean the increase of financial expenses in the past era.

**The formation of capital status and structure of the analyzed Heves county company model between 1992- 2000**

During the study I chronologically defined the values per company, then the average values of the items of the balance and profit-and loss accounts of the company model. By processing the indices compiled indices form the basic data of certain enterprises I counted the average of indices which can be regarded decisive from the point of view of the examination of capital structure, which can be found in Table 1. During the composition of indices I consulted the works of MRS BORDA (1989), GYULAI – JÁNOSA – KÁLLAI (1996), HÁMORI (2000), KOVÁCS – KESZTHELYI (2001), REKE (1997 a, b, c,).

In the chronological change of indices the average was calculated, the variety, median, upper and lower quartile, maximum and minimum were defined. (Table 2.)

Conclusions drawn from the chronological analysis of the examined indices:

In the first part of the 1990s the ratio of foreign capital when compared to personal capital equaled nearly 30%, in 1997 this value reached 60%, what is more, in 1998, it even exceeded it.
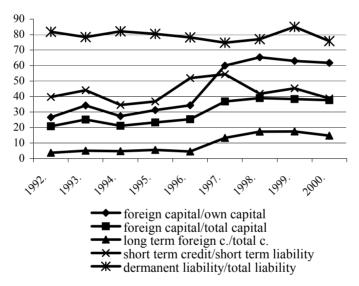
In 1998 the ratio of foreign capital was above 80% on a national average. In case of the county company model even after 1998 values above 60% could were present but in

1999 and 2000 the value of the rate index showed a slight decrease. The level of financial capital transfer lagged behind the national average throughout the 9 years in question.

In the case of the agricultural enterprises of Heves county the level of indebtedness was on the rise although the value of domestic capital still exceeded the amount of liabilities. This is partly due to the fact that banks as a result of the weak profitability position of the examined enterprises – apart form a transitional period – did not consider most of the enterprises creditworthy. On the basis of the liquidity indices and those of indebtedness companies complied with the conditions of creditability but their ability for profit-making is obviously weak. The value changes of the indices of capital structure in the case of Heves county agricultural enterprises are presented by Figure 1.

Figure 1

**The chronological formation of averages of capital structure based on the data of Heves county model (%)**



From: own calculations based on the annual reports of the company models

The ratio of foreign capital in the case of these companies has significantly increased starting from 1997 and it not only showed the effect of the appearance of capital substituting credits but also marked the increase of the short-term current asset credits. In the 3 consecutive years before 1997 – when compared to the previous state- the profitability indices were better thus banks could upgrade the creditworthiness of companies to be better. Since then creditworthiness became even worse and its effect could be felt on the decrease of the volume of foreign capital - although not entirely and a bit delayed in time.

I concluded that the rate of increase of the ratio of foreign capital within capital structure was more dominant than the national average till 1997. This process slowed down from 1998 on. After the introduction of capital substituting credit construction the ratio of foreign capital began to rise on a national level. Despite of this, in the enterprises in the study I experienced that the ones who applied for capital substituting credits used them to

substitute for the previous short-time liabilities and thus it did not result in the further rise of indebtedness.

I concluded that a lower capital transfer did not necessarily mean a more favourable situation for management. If a lower capital transfer goes together with a very low profitability or loss then it is presumably the lack creditworthiness which causes the relatively lower level of foreign capital.

I deem it a positive effect that within the range of liabilities the ratio of long-term liabilities has increased since 1997 partly due to the strong investment activity and to the increase in the ratio of medium and long-term credits with interest support. Till 1996 the values of this index were just below the ones of the national average and after 1997 they even exceeded the latter ones. In 2000 again I observed a decrease.

The rate of increase of long-term liabilities between 1997 and 1999 exceeded the rate of increase of the value of the invested assets. Long-term liabilities gained a more and more important role in financing current assets so the "change" to a conservative financing strategy could also be introduced in the case of these enterprises. This statement was even justified by the net value change of the circulating capital of these companies. In 1997 there were 9, in 1998 there were 8 and in 1999 and 2000 there were only 5 companies that had a negative net value of circulating capital, which refers to the aggressive financing strategy. (I did not disregard the fact that – within the operating funds in relation to the ratio of current assets regarded constant and transitive from the point of view of financing- even in the case of a positive net circulating capital there can be an aggressive financing strategy).

During the detailed interviews carried out in the case of my on the spot observations, I experienced that the financing strategy had not been consciously formed at these enterprises. Five of the management board members declared that their enterprise was almost continuously lacking funds so they had to grasp all opportunities to ease the situation and then they did not consider the expenses and risks of capital structure. Only one of the managers said that they had – only occasionally – opportunity to formulate their capital structure according to economical aspects besides handling the lack of capital.

Till 1997 within the short-term liabilities I observed that the volume of credits had stayed at one level and they had even risen.

In the case of the observed enterprises profitability became better only between 1994 – 1996. The creditworthiness increasing effect of this showed up in the short range and, as a result, in 1996 and 1997 the ratio of short-term credits rose within the short-term liabilities.

The ratio of short-term credits exceeded the level of the first part of the 1990s with almost 10 per cent in 1997 and 1997. From 1998 there was a decrease again. In parallelly, after 1998 the role of other short-term liabilities and first of all the role of supplies became once again important within short-term liabilities.

The ratio of supplies was the lowest in 1996 and 1997. This justifies that enterprises need the sources of compulsory creditors to a lesser degree while their creditworthiness is becoming better.

The personal meeting with the managers of the enterprises who took part in this examination convinced me that in the case of enterprises a kind of "fear" of foreign capital could also determine the decisions in connection with the formation of capital structure. While making these detailed interviews the expense of foreign capital was considered to

exceed the one of domestic capital without exception and that is why own capital was preferred within the capital structure.

When interpreting the meaning of outstanding profit the managers of the observed enterprises represented very different points of view and opinions also differed about the judgement of the "tax shield" effect caused by foreign capital. The reason for the latter was that the pre-tax profit of the enterprises was very low and can also be negative in many cases so tax savings caused by writing interest off as expenditure have no effect on them or its significance is not totally clear for them.

I concluded that in the case of enterprises with a more diverse production structure the ratio of foreign capital was higher than the average and within it the ratio of long-term liabilities also became higher. The possible reason for this is that a more diverse production structure makes the creditworthiness of the enterprises better and it is even easier for them to get credit from the banks. My second conclusion is that the enterprises with a more diverse production structure are not definitely more profitable enterprises as the spread of the profit is lower. In the case of these companies the pre-tax profit (and even the profit of operation) fluctuates within a tighter interval than in the case of companies showing a less diverse production structure- thus profit stability is better.

The liquidity indices of companies with a more diverse production structure were not higher than the ones of the other companies but within the current assets appearing in the statistics ratio of funds were higher.
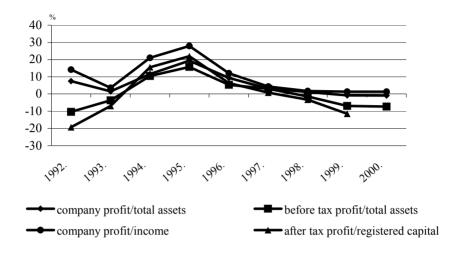
The self-financing capacity of Heves county agricultural enterprises lags 5-8 per cent behind the national average. The average of cash flow from the profit side was low and showed a significant spread between the certain years.

Investment activity was the same as the national average but due to the very low profitability the amortisation funds had an even more important role among the investment funds in most years.

Profitability indices showed that profitability had been more favourable between 1994 and 1996 than the national average. Only the years 1995 and 1996 were excellent regarding profitability on a national average. In Heves county there was an amelioration even in 1994 when compared with the previous years.

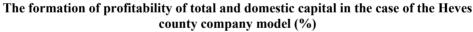The formation of profitability is shown by Figure 2.

Figure 2

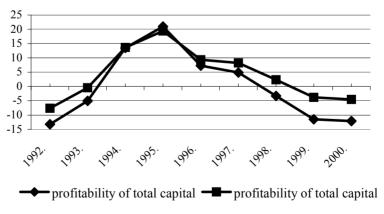**The formation of the average of profitability indices based on the Heves county model (%)**



From: personal calculations based on the annual reports of the company models

The profitability of total capital exceeded that of domestic capital almost every year. This national trend has also materialized on a county level. The formation of profitability of total and domestic capital is presented by Figure 3.

Figure 3

**The formation of profitability of total and domestic capital in the case of the Heves county company model (%)**



From: personal calculations based on the annual reports of the company models

I concluded that in 1994 and 1996 the profitability of the companies whose focus was plant production and horticulture became better while in 1995 higher profitability was reached by companies whose focus was animal husbandry.

After 1996 the level of pre-tax profit dramatically decreased (even in 1997 it was weaker than the national average). Since 1998 the index before assets proportional taxation of the Heves county model could only be described by negative values (and within it with greater values in absolute value). On a national level the summarised balance of pre-tax profit was only negative in 1999. (BORSZÉKI 2000)

The profit of Heves county agricultural enterprises became greater between 1992 and 1995 – not considering the decrease of 1993 – and since then the basic activity brought less and less profit. What is more, it even was negative in 1999 and 2000. In 1992 and 1993 concerning company profit more companies had losses than gains, but between 1994-1998 the situation was the reverse. Since 1999 the number of companies with losses has been again bigger than the number of ones with gains.

The average financial profit in certain years influenced pre-tax profit to a different extent. While in 1992 the financial losses amounted to approximately 32% of the absolute value of positive company profit then in 1995 it was hardly 15%.

In 1998 financial losses exceeded the absolute value of positive company profit and it made the pre-tax profit negative. In 1999 the absolute value of financial losses was more than sevenfold the absolute value of losses at the company level, in 2000 it was two and a half times more. The specific financial losses (per enterprise) did not increase, on the contrary, with the exception of 1999 when there was a decrease. The continuous decrease of the pre-tax profit since 1996 was not only the consequence of the greater financial losses, rather of the continuous decrease of profit at company level. This refers to the fact that the reasons for the decrease of self-financing capacity not only lie in the income dissipation due to the expenses of foreign capital but in the decrease of the profit-making ability of the company focus.

The formation of the values of certain profit categories is presented by Figure 4.
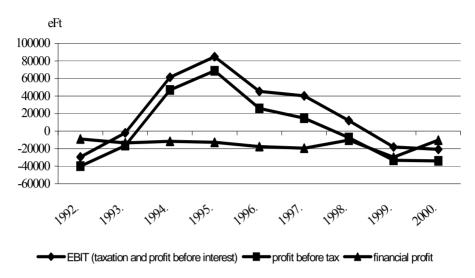
Figure 4

**The formation of the average of each result category based on the model of Heves county (thousand HUF)**

eFt



From: personal calculations based on the annual reports of the company models

In the examined period in each year the number of enterprises, which paid dividends on shares do not exceed 4 and the dividend rate was under 20 percent. I do not consider the income dissipation of the owners overwhelming.

The cash-flow indicator of enterprises in Heves county exceeded the national average in each year but the proportion of the supplies and liabilities were higher in the current assets than the national average.

Identical tendencies within the national data can be seen in the change of the calculation of assets' efficiency (income/total assets). Although the national values are more favourable than the ones in Heves county. In the last 5 years the indicators were higher by 20-25 percent on average than in the county. It can refer to the amortisation of the assets, especially the tangible assets, but it can indicate disturbances in the use of capacity, as well.

The insufficient use of capacity can be indicated by the fact that fewer current assets were used in Heves county than on the national average - in comparison with the volume of invested assets. In the case of the model from Heves county the value of current assets in 1992 was 51.19% compared with the invested assets. It was 83.41% in 1996 and 97.51% in 2000. In the same years the national values were the following: 60.24%, 104.73% and 113.20%, respectively.

The decrease of invested assets in the given period makes the situation even more difficult.

In 2000 the invested assets amounted to 90.10% of that in 1992 and it was 82.21% of that in 1996.

The cause of the relative lack of current assets is the lack of foreign assets, the lower level financial capital transfer behind which the main motive is poor creditworthiness. The

decreasing number of current assets make the use of the capacity of tangible assets impossible, taking economical views into account. The evaluation of indicators in relation with tangible assets is distorted by the write-off assets still used in enterprises.

From 1992 to 1996 the proportion of registered capital within domestic capital on national average exceeded the values of the model from Heves county but there was a change from 1997. In the Heves county sample the level of the registered capital compared to the own capital stabilised at the level of approximately 75% while it was converging to 60% on the national average.

I did not draw further conclusions from the above mentioned facts as in the model taken from Heves county we can find companies only using double-entry bookkeeping while the national data refer to a wider range of companies with the obligation of filing corporate tax return including firms with single –entry bookkeeping.

The registered capital is lower at companies using double-entry bookkeeping than in companies the single system
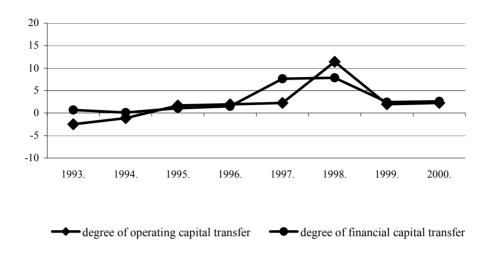
I came to the conclusion that the role of reserves became greater on the national average within the domestic capital, while in the case of the model from Heves county- because of worse profitability- reserves (mainly profit reserves) had a minor role.

In Heves county the level of operating capital transfer and financial capital transfer became higher in the second half of the decade and there was a drop at the end of the decade but the values were higher than they were in the first part of the decade.

The DOL indicator:

% change in EBIT / % change in Revenues

The DFL indicator:

% change in EPS / % change in EBIT

Figure 5 shows the value change of DOL and DFL indicators.

Figure 5

**The formation of the level of operating capital transfer (DOL) and financial capital transfer (DFL)**



degree of operating capital transfer    degree of financial capital transfer

Source: personal calculation based on the annual reports of the company models

The profitability of companies was higher than the national average between 1994-1996 and in other years it significantly lagged behind. The profit change is striking in the case of the model from Heves county.

The explanation for that can be found in the higher operating capital transfer of the companies because of which the EBIT value shows higher fluctuations influenced by the change of turnover and the value of pre-tax profit. In the years when the price at current exchange was significantly higher compared with the previous year (in 1994 it increased by 25% compared with, 1993, 1995 by 23% with 1994, and in 1996 by 24% with 1995) pre- tax profit increased dramatically. From 1997 current price profit decreased, which was accompanied by the loss of value before tax.

As the operating capital transfer is the highest at the break-even point it results in the fact that the majority of the observed enterprises reached close to the break-even point.

In 1993, 1994, and 1996 the operating capital transfer became negative. This occurred under the break-even point. In this case as an effect of the increase in turnover –if there is a possibility of an increase in turnover- the loss of activity decreases.

To sum it up, we can state that the change of the capital structure of agricultural enterprises in Heves county followed the national average. But the agricultural enterprises of the county used less foreign capital than the national average and the number of credits were lower in this area. The rate of increase the own capital lagged behind the national average, which further restrains the possibility of self-financing.

Table 1

**The average figures of the most important indices describing the management of the enterprises of Heves county company model**

| Name | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | average |
|---|---|---|---|---|---|---|---|---|---|---|
| Capital transfer(%) | 26.56 | 34.21 | 27.28 | 31.23 | 34.35 | 60.02 | 65.36 | 63.00 | 61.75 | 44.86 |
| Capital supply(%) | 78.13 | 73.37 | 77.39 | 74.88 | 73.66 | 61.43 | 59.65 | 60.52 | 61.02 | 68.89 |
| a) foreign capital/total capital (%) | 20.75 | 25.10 | 21.11 | 23.38 | 25.31 | 36.87 | 38.98 | 38.34 | 37.68 | 29.72 |
| b) long1. foreign capital/total capital(%) | 3.72 | 5.07 | 4.77 | 5.56 | 4.51 | 13.33 | 17.41 | 17.46 | 14.83 | 9.63 |
| Long 1. foreign capital/total liability (%) | 17.95 | 20.20 | 22.61 | 23.77 | 17.83 | 36.15 | 44.65 | 45.54 | 39.36 | 29.78 |
| Long term assets/total assets(%) | 81.86 | 78.44 | 82.16 | 80.44 | 78.18 | 74.76 | 77.06 | 85.04 | 75.85 | 79.31 |
| Suppliers/short term liability(%) | 18.94 | 23.83 | 17.69 | 18.82 | 13.01 | 14.79 | 29.95 | 29.33 | 21.64 | 20.89 |
| short/term lcredit1./short term 1. liability(%) | 39.71 | 44.06 | 34.54 | 36.82 | 51.94 | 54.39 | 41.75 | 45.29 | 38.76 | 43.03 |
| Other short t. liability1./short t. liab.1.(%) | 27.15 | 22.75 | 40.85 | 39.14 | 24.30 | 15.65 | 22.69 | 18.53 | 28.53 | 26.62 |
| Income/total assets(%) | 52.75 | 43.80 | 54.97 | 69.42 | 77.62 | 72.99 | 65.05 | 65.81 | 64.65 | 63.01 |
| Company profit/total assets (%) | 7.46 | 1.54 | 11.55 | 19.40 | 9.32 | 3.14 | 1.12 | -0.84 | -0.88 | 5.76 |
| Pre/tax profit/total assets(%) | -10.34 | -3.68 | 10.41 | 15.72 | 5.34 | 2.99 | -1.46 | -6.95 | -7.31 | 0.52 |
| Company profit/income(%) | 14.14 | 3.52 | 21.01 | 27.95 | 12.01 | 4.30 | 1.72 | 1.29 | 1.36 | 9.70 |
| Profitability of own capital (%) | -13.23 | -5.02 | 13.45 | 21.00 | 7.25 | 4.87 | -3.28 | -11.49 | -12.08 | 0.16 |
| Profitability of total capital (%) | -7.61 | -0.48 | 13.65 | 19.38 | 9.34 | 8.19 | 2.32 | -3.80 | -4.52 | 4.05 |
| Liquidity | 1.98 | 1.95 | 2.21 | 2.20 | 2.42 | 2.21 | 2.58 | 2.33 | 2.12 | 2.22 |
| After tax profit/registered capital (%) | -19.28 | -6.95 | 15.52 | 21.95 | 6.37 | 0.73 | -3.29 | -11.49 | -15.74 | -1.35 |
| DOL | - | -24.82 | -1.14 | 1.67 | -1.93 | 2.25 | 11.42 | 0.98 | 2.26 | -1.16 |
| DFL | - | 0.68 | 0.11 | 1.09 | 1.52 | 7.62 | 7.85 | 0.98 | 2.62 | 2.81 |
| Income/total liability(%) | 0.53 | 0.44 | 0.55 | 0.69 | 0.78 | 0.73 | 0.65 | 0.66 | 0.65 | 0.63 |
| EBIT (000Ft) | - | -2185.38 | 61388.81 | 84702.59 | 45310.23 | 40044.05 | 11970.10 | -18316.71 | -20905.21 | 19167.79 |
| Net circulating capital(000Ft) | 64354.00 | 85145.00 | 88978.00 | 93589.00 | 128967.00 | 138732.00 | 175232.00 | 140272.00 | 115496.00 | 114529,44 |
| Before tax profit (000Ft) | - | -16563.21 | 46823.81 | 68711.50 | 25903.73 | 14646.58 | -7559.28 | -33493.89 | -34070.06 | 2702.49 |
| Profit(000Ft) | 204408.8 | 196777.87 | 247127.76 | 303306.11 | 376233.26 | 356798.00 | 334877.86 | 316816.66 | 298638.82 | 272776,11 |
| Financial profit(000Ft) | -9100.008 | -13465.96 | -11691.68 | -12957.19 | -17741.96 | -19493.79 | -10454.71 | -29882.78 | -10295.76 | -15009.31 |
| From: own calculation | | | | | | | | | | |

Table 2

**Statistical analysis of indices describing the management of the agricultural enterprises of Heves county**

| Name | average | scatter | minimum | lower quart. | median | upper quart. | maximum | med- average | med-aver./average | med-aver./scatter |
|---|---|---|---|---|---|---|---|---|---|---|
| Capital transfer(%) | 44,86 | 16,048583 | 26,56 | 31,23 | 34,35 | 61,75 | 65,36 | -10,51 | -0,234322 | -0,655025 |
| Capital supply(%) | 68,89 | 7,5229561 | 59,65 | 61,02 | 73,37 | 74,88 | 78,13 | 4,48 | 0,064963 | 0,59492 |
| a) foreign capital/total capital (%) | 29,72 | 7,5285901 | 20,75 | 23,38 | 25,31 | 37,68 | 38,98 | -4,41 | -0,148512 | -0,586357 |
| b) long1. foreign capital/total capital(%) | 9,63 | 5,6242322 | 3,72 | 4,77 | 5,56 | 14,83 | 17,46 | -4,07 | -0,422571 | -0,723457 |
| Long 1. foreign capital/total liability (%) | 29,78 | 10,872516 | 17,83 | 20,2 | 23,77 | 39,36 | 45,54 | -6,01 | -0,201932 | -0,553179 |
| Long term assets/total assets(%) | 79,31 | 3,1359067 | 74,76 | 77,06 | 78,44 | 81,86 | 85,04 | -0,87 | -0,01097 | -0,277432 |
| Suppliers/short term liability(%) | 20,89 | 5,579278 | 13,01 | 17,69 | 18,94 | 23,83 | 29,95 | -1,95 | -0,093298 | -0,349308 |
| short/term lcredit1./short term 1. liability (%) | 43,03 | 6,2905934 | 34,54 | 38,76 | 41,75 | 45,29 | 54,39 | -1,28 | -0,029722 | -0,203302 |
| Other short t. liability1./short t. liab.1.(%) | 26,62 | 8,0606416 | 15,65 | 22,69 | 24,3 | 28,53 | 40,85 | -2,32 | -0,087191 | -0,287956 |
| Income/total assets(%) | 63,01 | 10,043046 | 43,8 | 54,97 | 65,05 | 69,42 | 77,62 | 2,04 | 0,03243 | 0,203458 |
| Company profit/total assets (%) | 5,76 | 6,4030305 | -0,88 | 1,12 | 3,14 | 9,32 | 19,4 | -2,62 | -0,454545 | -0,408661 |
| Pre/tax profit/total assets(%) | 0,52 | 8,2650201 | -10,34 | -6,95 | -1,46 | 5,34 | 15,72 | -1,98 | -3,783898 | -0,240102 |
| Company profit/income(%) | 9,70 | 9,1732994 | 1,29 | 1,72 | 4,3 | 14,14 | 27,95 | -5,40 | -0,556701 | -0,588665 |
| Profitability of own capital (%) | 0,16 | 11,483708 | -13,23 | -11,49 | -3,28 | 7,25 | 21 | -3,44 | -21,08163 | -0,299845 |
| Profitability of total capital (%) | 4,05 | 8,6076797 | -7,61 | -3,8 | 2,32 | 9,34 | 19,38 | -1,73 | -0,427475 | -0,201241 |
| Before tax profit/total capital | 0,52 | 8,2650201 | -10,34 | -6,95 | -1,46 | 5,34 | 15,72 | -1,98 | -3,783898 | -0,240102 |
| Liquidity | 2,22 | 0,1893719 | 1,95 | 2,12 | 2,21 | 2,33 | 2,58 | -0,01 | -0,0055 | -0,064541 |
| After tax profit/registered capital (%) | -1,35 | 13,156797 | -19,28 | -11,49 | -3,29 | 6,37 | 21,95 | -1,94 | 1,431034 | -0,147199 |
| DOL | -1,16 | 9,7118368 | -24,82 | -1,3375 | 1,325 | 2,2525 | 11,42 | 2,49 | -2,138561 | 0,256259 |
| DFL | 2,81 | 2,9234416 | 0,11 | 0,905 | 1,305 | 3,87 | 7,85 | -1,50 | -0,535381 | -0,514377 |
| Income/total liability(%) | 0,63 | 0,100443 | 0,4381 | 0,5497 | 0,6506 | 0,6942 | 0,7762 | 0,02 | 0,032371 | 0,2031 |
| EBIT (000Ft) | 19167,79 | 38128,089 | -29498,35 | -18316,71 | 11970,1 | 45310,23 | 84702,59 | -7197,69 | -0,37551 | -0,188777 |
| Net circulating capital(000Ft) | 114529,44 | 32685,402 | 64354 | 88978 | 115496 | 138732 | 175232 | 966,56 | 0,008439 | 0,029571 |
| Before tax profit (000Ft) | 2702,49 | 36444,437 | -40076,76 | -33493,89 | -7559,28 | 25903,73 | 68711,5 | -10261,77 | -3,797153 | -0,281573 |
| Profit(000Ft) | 292776,10 | 60247,554 | 196777,87 | 247127,76 | 303306,11 | 334877,86 | 376233,26 | 10530,01 | 0,035966 | 0,174779 |
| Financial profit(000Ft) | -15009,31 | 6184,9254 | -29882,78 | -17741,96 | -12957,19 | -10454,71 | -9100 | 2052,12 | -0,136723 | 0,331795 |

From: own calculations

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# The role of international food aid and its negative consequences on the Hungarian agricultural export markets

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## Abstract

The world economic crisis in 1998 affected several areas of life in a disadvantageous manner. Applying food aid became necessary, and the concerns of trade distortion emerged again. Our agricultural trade was affected greatly by the Russian crisis and set back our export to Russia. There were several reasons for the set-back but the effects of the food aid shipments - that were forwarded to Russia from the USA and the EU - were particularly adverse. While the USA and the EU almost reach the level of export they reached before the crisis, our export is still half as big as it was in 1997. Unfortunately our export seems to stagnate for a long time.

### Key words

food aid, Russian crisis, export markets of Hungary, agricultural trade, EU, WTO

## Introduction

International food aid has no direct effect on Hungary's trade as we are neither important donor country nor country in need of aid, but the indirect side effects of food aid on our trade are significant. These side effects arose spectacularly in connection with our trade with Russia in the past few years.

There were several factors beside food aid that determined the changes in our agricultural trade with Russia after the economic crisis of 1998.

- The market of Russia passed beyond the crisis and recovered. The increasing production, the domestic supply meets the big parts of the national demand.
- The inner market of Russia transformed due to the crisis: the demand - the structure of the consumption - and the supply turned into a behaviour that fits the market better.
- The sad experience is that our wealthier competitors can supply new segments of the market by themselves after replacing our products with theirs.

I search how the food aid affects the tendencies of our agricultural trade towards our eastern markets. There is no use in resembling the export from Hungary, from the USA and from the EU because of the significant difference in the market size. It is worth putting emphasis on the examination of flow of commerce. Therefore we should search how the increase of the imports to Russia (issuing from the food aid of our competitors) affects the decrease of our export and how the decrease of our export affects the increase of the shipments of food aid.

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I examine in my article, what the donor country should take into account when it uses food aid for supporting food security in regions where the problem of food insecurity emerges. The practice of offering food aid for Russia since the crisis of 1998 didn't prove to be really successful and effective enough tool, in alleviating food insecurity, till now. Its side effects hindered the fulfilment of the aim of the WTO: to achieve free and fair trade.

The evaluation and future orientation of Council Regulation No.1292/96 was a basic source of the general analysis of food aid in my paper. For the analysis of the crisis in Russia the study of János Kartali, which was about world economic crisis, and the papers of the researchers of the GKI, the USDA-ERS and the AKII supported my work significantly.

## 1. The food aid

Food aid is a response for insecurity caused by natural or by man-made disasters. For countries in need the only alternative usually is requiring food aid. Food aid is a tool of the accomplishment of development programs for long term, but nowadays their main task is to offset food-shortage immediately. Applying food aid is also needed if the food-production of the country fluctuates in such a degree and frequency that it endangers the appropriate and sufficient food supply. If there is shortage in inner food-stocks, it can occur that food-shortage can be prevented only with food aid. Food aid therefore remains an essential instrument in handling the problem of transitory, temporary, repetitive and emergency food shortages for a long time.

Humanitarian objectives always remain the main criteria when giving food aid, but (as it emerges further) not the unique reason for applying aid. Saving human life, and meet all demands are crucial indeed, but economic and political aspects play also very important role in decision-making. The production of the donor country, the structure of the export also determines the aid shipments. It is important that the interests of both the donor and the recipients country coincide at the same time, because if we disregard the political or economic considerations of the donor country, the assistance of lobbies or the support of interest groups can be lost, that may results the decrease of the sum put away for food aid.

It is important that the aim and the effects of the assistance will not be contradictory, as we could notice when the World Bank tried to assist the crisis in Argentina (most of the supports instead of having helped the country in need flew back to the developed countries and deepened the slump in the crises-stricken country.

In spite of the negative effect of the food aid - e.g. the decrease of the production in consequence of the price reduction - food aid is a wildely accepted instrument in relieving food insecurity. This fact is backed up (Shapouri, Rosen, 2001) by that food aid were equal to 92 percent of consumption shortfalls. In another way we can deduce in principle the degree of the food shortage from the degree of the use of food aid. The general declining tendency of aid and the yearly change of the insufficient consumption, however, may contradict that phenomenon, because that is not true that the food shortages decreased. Food aid covered less than 60 percent of the food shortage in the last ten years.

### 1.1. The effectiveness of different types of providing food aid

There is a kind of difference of opinion relating to effectiveness of different types of providing food aid. When we judge the efficiency, the donor country is usually charged with

that it prefers showing an interest in its own benefits first to taking the interest of the poor country into consideration above all. That accusation is not always without unfounded arguments, but we can not often condemn it because of its conduct.

**The behaviour of the donor country can be different, when it gives aid:**
- The behaviour is ideal in that case when the need appears, the donor country gives aid, and it does not distort commercial intercourse, but serves as alleviating famine.
- The behaviour can be good, if it gives financial aid - recently this form has become more an more general -. In this case the donor country can not be charged with that he uses food aid for decreasing its food surpluses, as financial aid is not in connection with surpluses in most of the case.
- The behaviour can be adequate when the donor country gives goods as aid, but in this case the suspicion of easing its own surpluses emerges again. We can neighter expect the donor country to endanger his own food-supply by selling his products as food aid that corresponds exactly to his own needs, nor we can expect to produce exclusively for food aid. The donor countries can give aid, if they can afford it. In this case surpluses remain that can be used for giving aid, which is a useful instrument for avoiding crisis. The donor countries are from the developed part of the world. Their crises would result further deterioration of the economic situation of the countries in need. Easy to understand that the issue of the food aid come to the front both when surpluses appear and starvation emerges.
- The behaviour can be selfish, if the donor country considers food aid just as an intrument of the alleviation of its surpluses and tries to neglect the interest of the country in need and the other participants of the market, so it becomes a trade monopolist in free market.
- Malicious the behaviour of the donor country if it treats the country in need as a possible competitor, and ruins its production (e.g. the economy of the country facing crisis will get damaged for a long time in consequence of the burden of loan recovery owing to the irresponsible or malevolent granting of credit from the donor country). The behaviour can be even worse if the „donor" country utilizing the „business" opportunity, trample over the poor country with the aim of getting even more market share and reaching entire dominating position in the market.

For the donor country, enforcing its trade interests is a permanent motive power. There are only some periodic possibilities to give aid by reducing surpluses, when surpluses appear and icrease. The appearance of humanitarian need does not depend on the state of the donor country (whether there is food surplus or not at that time), the financial aid can be applied much freely, so the donor country can enforce better its interests too. What type of aid is better finally? I systematized the advantages and the disadvantages of the food and financial aid; I summarize some theoretical results of my work as follows.

Before applying financial or commodity aid the donor country should examine its consequences - advantages and disadvanteges of their use - :

**The advantages of the financial aid:**
- As it is not in close relation to food stocks, the donor country can't be accused of using aid in order to reduce its food surplus.

- It is a flexible instrument: countries in need can use it for what they consider necessary.
- The remittance of money is faster, than commodity aid.
- The application of finacal aid - mainly when the donor country is wealthy enough - helps to use commodity aid later, thus helps to get rid of surpluses, and to find new markets as well.

**The disadvantages of the financial aid:**
- The application of financial aid, however, is faster (as written earlier), because after the remittance of money, the time that is necessary for getting food will increase the duration of the arrival of the food aid, so it results loss of time.
- As it is a really flexible instrument, the danger of using it as a tool of corruption will grow.
- It may be against the trade interests of the not so wealthy countries, because they can't apply this kind of instrument of food aid so easily. Countries using financial aid can participate easier in the competition for new markets, than the countries who may posess surpluses, but they are less rich (like Hungary), so they will lag behind in the competition and may loose they markets, contrary to wealthier counries.
- Applying financial aid, food surpluses will remain in the donor country that may be the source of further serious problems. In the view that surpluses decrease generally, the before mentioned side effect is eased while using financial aid becoming widespread.

**The advantages of the commodity aid:**
- It is a prompt direct support, as there is no need to spend time with purchasing, than in case of financial aid.
- It is a less flexible instrument in the corruption, as it is hard to be used for other purposes than to consume it.
- Vanishing surpluses by using commodity aid we can prevent crises caused by overproduction.

**The disadvantages of the commodity aid:**
- It serves obviously the interests of the donor country, as it decreases its surpluses. Regarding the utilization of financial aid independently of time, the financial aid can serve trade interests as well.
- Above all, it reflects the possibilities of the donor countries, not the demands of the receiving/host country, thus its use is less flexible.
- Assembling and forwarding to the country in need requires more time, than handling financial aid, because the country in need usually has difficulties in infrastructure and distribution too.
- In the receiving country goods coming back to the markets may disturb the prices not only in domestic but foreign markets too, mainly if these goods will be exported.
- Giving food aid so long, it may hinder the national market to strengthen.

The donor country should select the adequate type of the aid taking above all humanitarian purposes into consideration in harmony with the overall advantages, and after this it should decrease the other harms of the crisis regarding economic changes and interests.

The general disadvantages of aid (these may be advantages of the other type of aid) can lead to crises. Economic crisis is the hotbed of corruption, these notions are closely linked together. Important task is to set the corruption back and to advance the stabilization of the economy during the application of aid, as the unusual circulation of money cause disturbance in world trade that may advance that the crisis takes a turn for the worse and that may result automatically the continuation of giving food aid.

The adequate combination of advantages and disadvantages will hopefully give the best solution that can support efficiently the achievement of humanitarian and ecomomic purposes contemporaneously.

## 1.2. The activity of organisations and countries that are involved in giving food aid

The following international organisations and programs are engaged in the work of giving food aid: WTO, UNO-FAO (Food and Agriculture Organisation), WFP (World Food Program), IFAD (International Fund for Agricultural Development), UNDP (United Nations Development Programme), WB (World Bank), UNICEF (United Nations International Children's Emergency Fund), UNESCO (United Nations Educational, Scientific, and Cultural Organization), ILO (International Labour Organisation), WHO (World Health Organisation).

Beyond and beside public assistance, several NGOs (non-government organisations) participate in providing aid, which arm in arm with state organizations try to fight against food insecurity and struggle for appropriate food supply.

The participants of conference of the **FAO** in July 2002 scrutinized the realization, the accomplishment of the goals that were set on the former meeting in 1996, and they fixed the tasks of the following period. The realization of the vast goals for the previous 6 years, however, was far from complete, the latest objectives for the following years are also quite remarkable. The main goal of the World Food Program is to halve the world hunger for 2015.

The regulation of the **WTO** determined the allowed tools in providing food aid up to 2000. There has not been made new regulation so far. New round was set off after the Ministerial Conference in Kathar. Until the launch of the new regulation predicted finishing by 2005, the former regulation will remain valid. During the negotiations participants pay distinguished attention to the moderation of the role of the continuous export subsidies and the questions of the efficiency of financial aid (the decrease of the importance of financial aid, may reduce the effectiveness of handling and of the distribution and purchase).

The poorest countries are dependent on the subsidized so low-priced imports of foodstuffs. Because of the WTO regulation which ordered the reduction of the subsidized exports, the loss of these poor countries are compensated by giving this countries food aid and subsidy that helps to develop the national agriculture, and give the possibility of applying for credit of the IMF and the World Bank. Unfortunately it occurs often that aid, credits originating from international organizations (IMF, WB) serve to cover the credits from trade companies and banks originating from the developed part of the world as well. *Therefore the role of the subsidized country degrades to a tool that serves the flow or exchange of money between the participants (from the taxpayers to business enterprises) of*

*the developed world, so only a little part of the money (invested in aid) transforms indeed into real value in the needy country.*

The **United States** is pioneering in providing food aid for a long time, and it sperheads the drive between the countries, which partake of the international activity for helping needy countries. The food aids from the USA in the 1950's were generally known that served the reduction of the grain surpluses. The volume and share of the food shipments from the total exports decreased from the 1960's. The tendency with a little fluctuation lasts nowadays also. The USA contributed to ease the food insecurity in Russia after 1998 with wheat and meat. Russia in 1998-2000 received commodities from the USA worth about 1.1 billion USD – 409 million for commodities, 180 million for transportation and 520 million trade credit to purchase products (corn, meat, and soybean) from the USA (Russia: issues and analysis, 2001). In 1999 Russia asked the USA for additional food aid, primarily animal feed rather than than foodstuffs.

**The EU** provided food aid packages in large quantities from the 1960's. The system of the food aid of the EU related to more, than 30 countries. The ECHO (European Office for Emergency Humanitarian Aid) fulfils the duty of the EU to provide support for country in need from its establishment in 1992.

It supported the catering of the refugees after the Chechnyan crisis with 23 million Euro, and gave assistance to Belarus, Moldavia, and Ukraine, wich countries got serious structural crises, with 2,8 million Euro. The EU packages to Russia contained mainly wheat and meet too, amounted to 470 million USD.

The objections of the EU on the WTO meetings to the practice of the food aid shipments of the USA forwarded to Russia are similar to Hungary's objections to the EU and the USA. The attitude of the EU to the effects of food aid from the USA to Russia is similar than the Hungarian approach, because in consequence of the aid of the USA to Russia, the EU encountered difficulties in developing trade relations and exporting its products to Russia, so it deteriorated the problem of the overproduction in the EU. And what is more surpluses hinder the improvement of our export to the EU.

**Hungary** has offered food aid packages (mainly fruit jam, canned beef, worth about 110 thousand dollars per year) through the UNO forwarded chiefly to Jemen since the 1970's. The commodity aid has been being replaced gradually by financial aid, worth about 65 thousand dollars per year.

The Court of Auditors special report in the EU in 2000 found that the EU assistance in solving the problem of food insecurity in Russia after the crises didn't prooved to be successful. *The reason for the inefficiency of the EU consignments was partly that the EU examined, although, carefully the distribution of the packages, but it ignored the examination of the use of the shipments.* For example, a part of the aid was placed at such a high price in order to safeguard commercial imports from the EU that much of it had to be placed in storage for a number of months. **The issue of the food shipments are more commercial, than humanitarian.** It is important that the EU was who drew up that critique.

## 2. International economic crisis and the changes of Hungary's market relations

The worry emerged generally that the importance of the food aid shipments doesn't increase indeed at the time when food insecurity arises because of the crisis but when

surpluses appear. Surpluses emerge not only at that time when the production is badly controlled, but when demand backed and the purchasing power of the population weakened. These two notions are characteristic of those crises that are responsible also for the growth of surpluses and the surpluses are responsible for - through the declining prices – the development of the crises.

Three regions were shocked by the recession in the nineties:
1. **The countries in Latin America** have serious economic problems for a long time. The crash of the stock exchange in Mexico and the following crisis in Brazil has got the most serious effects. For example the Stock Market's index diminished more than 50% in Brazil in 1998.
2. The crisis caused the most serious loss, in the third part of the nineties, in the newly industrialized **South-Asian countries** (Thailand, South-Korea, Indonesia, the Philippine Islands, Malaya, Singapore, Taiwan and Formosa). Right after the crises the first reaction of foreign investors was the withdrawal of enormous quantity of money from these markets.
3. From the point of view of Hungary, the **crisis in Russia** in 1998 was the gravest effect on our economy and within it on our agricultural export. These crises are attached closely to the crisis in Asia.
4. In addition to this, the recession in the USA, the introduction of the Euro, and the early weakness of the new currency, and its strong improvement after, affected to the trend of the world trade.

## 2.1. Economic changes in Russia and in the NIS

The overall decrease was typical in 1998: the GDP decreased by 4,6%, the industrial production by 5,2%, the agricultural production by 12,3%, the incomes decreased by 20%, and the deficit increased by 5%. The declining tendency of the consumption could not be prevented by the increase of import because of the very reason that the general insolvency emerged. The deficit of the foreign trade with the deterioration of the balance of payment on current account led to financial slump. The business failure that followed the financial crisis of 1998 continued to deteriorate our relations (with the NIS) which have a continuous worsening tendency from the nineties, too.

The capital intensive countries come to the front in our eastern markets following without delay the crisis. At this time these developed wealthy countries came to the front in Russia thanks to the tools (credits, state guarantees, subsidies, humanitarian freights and state financed aids) for helping to keep the export at the former high level in the midst of the crisis. These countries having a strong wealthy hinterland could offer unusual terms of payment (e.g. payment date) for the foreign broker. The problem is not only that we lost these markets during the period of the crisis but our fellow competitors acquired good positions for a long time in contrast with us: the traders of Western Europe and of the USA (chicken came from the USA, pig in big quantity came from Holland and Denmark).

Hungary could not afford to provide export credit guarantees; export-credit insurance amounted to billions of Forints by taking the foreign-credit risk upon itself, and the genuine risk takers: the companies who are usually in great need of capital couldn't take the risk of the unstable market of Russia.

Barters might remain, but the government of Russia limited its application, because of the fear that easily disposed sources of energy and easily marketable raw materials may leave the country within the framework of barter.

The EU becomes more and more important for us, with its certainly solvent, but really demanding market. This trend is backed up by the agreements on trade liberalization as well. After joining the EU, Russia will be for us an extra-EU trading partner that may bring us new trade barriers, thus its importance may sink further. After we join the EU we hope, we get higher subsidies that help us to find, close to our competitors, segments in the market of Russia.

## 2.2. Economic changes in Hungary

There was a lot of change that influenced the evolution of the competiviteness of our export in the last years (Hegedűs, Csáki, Losoncz 2002). The bandwidth of the **forint** was expanded in May 2002, which allowed the higher fluctuation of the currency within band, and caused the improvement of the Forint that reduced the competitiveness of our export. So our economic policy did not aim at improving our export competitiveness by its measures, but it tried to offset the export income shortfall by means of the increase of inner consumption and the improvement of the inner use and demand. The wage-level augmentation aimed at increasing the inner consumption was partly successful, but it was not able to compensate export income deficiency.

The continuous crises of the agriculture, the uncertainty of the production issued from the chronic lack of capital, the lack of consistent agricultural strategy are the main impediments of the increase of our export. These factors determine definitely the competitive position of the commodity reserves too.

As oil price doubled at the beginning of 2000, it influenced strongly the trend of our export. Beyond international crises the changes of the oil price contributed to the beginning recession of the USA at the end of 2000, which strengthen the isolative economic policy, and hindered the development of international relations. As the EU markets limited mainly to the inner market, our export possibilities declined simultaneously.

The results of the increase of oil prices were different in Russia: the sufficit of the balance of payment improved solvency of Russia that encouraged the export to Russia, when Russia became wheat exporter too. The decrease of the USD rate, the continuous recession can be the source of further serious problems that may be one of the main reason for the continuation of food aid shipments.

The isolation policy of our main competitors in the Russian market, the weakening possibilities on our main market (on the EU), the hopeful signs from Russia, the improvement of solvency, raise hope in getting back our positions in the Russian market.

Unfortunatelly, our little oil production and strong business relations with our competitors determine that with the EU and the USA we are companion in misfortune. We should now redirect our export to Russia, but the lack of capital is the main factor that hinders us to do it now. The lack of capital is also the cause of our economic policy's inelasticity that prevents us to do the appropriate changes during the time of the crisis.

Hungarian economy react immediately on the negative changes of economy (Russian crises), but to make use of the favourable opportunity, our capital intensiveness is very weak, thus our flexibility poor as well.

2.2.1. The effects of the Russian crisis on the Hungarian agricultural trade

The other more direct side effect of the aid is that our export to Russia plunged drastically in 1998.

Our export to Russia suffered the negative effects of the crisis. We have been able to export only a portion of our former quantity to Russia so far. Economic indices show that the situation in our eastern markets is improving: the economy seems to strengthen, the inflation of the currency decreased and the GDP increased by 4% in Russia and in the NIS countries in 2000. The development continued in 2001: the GDP increased more than 5%, and the improvement is believed to be long-lasting in Russia.

Because of our deficiency in funds economy we can not serve the goals of our agricultural trade strategy with food aid shipments. The Russian economy shows the signs of improvement, however, this favourable trend is not mirrored in the positive changes of our export. The reason for this sad phenomenon is partly that the commitment of our trade is really significant to the EU and our export to Russia has been already permanent for 3 or 4 years.

The spectacular development of the Hungarian economy in the last years of the nineties, has moderated, and it is likely that we can not expect a remarkable improvement in consequence of the changes of our and the international economy. The trend of our trade to Russia can be seen on the table 1.

Table 1

**The tendency of the Hungarian agricultural trade to Russia 1994-2001, Thousands of USD**

|  | **Exports** | **Imports** | **Balance** |
|---|---|---|---|
| 1994 | 337 574 | 2 994 | 334 581 |
| 1995 | 405 030 | 3 325 | 401 705 |
| 1996 | 325 570 | 2 374 | 323 196 |
| 1997 | 434 910 | 4 508 | 430 402 |
| 1998 | 317 104 | 4 054 | 313 050 |
| 1999 | **147 023** | 2 979 | **144 044** |
| 2000 | **163 690** | 3 959 | **159 731** |
| 2001 | **159 102** | **5 035** | **154 067** |
| 2002 | **166 640** | **2 420** | **164 200** |

Source: AKII, 2003

Right after the crisis our export to Russia slumped drastically. The crisis itself (through the decline of the inner consumption, the overall insolvency) and that our fellow competitors acquired better positions, than us, contributed to the remained low level even after the Russian economy got back to normal.

Although the decrease of our export started only in September, the degree of the slump has reached 28% of the 1997's by the end of 1998. In 1999 our export to Russia decreased by 54%. The volume of the export was about 160 million USD in the last few years and there was a modest increase in our export in 2002 too. The monthly tendency of our total export and the trend of our export to Russia can be seen on the chart 1. and chart 2.

The income from exports of pigmeat decreased significantly, from 37 to 3.5 million USD during the period of 1997-2001, the exports of poultry meat decreased from 13 to 0.5 million USD, and the sausage and salami exports declined as well. Russia took up 7% of our total poultry exports in 1998 (14 million USD), that was the 50% of the 1998's, that decreased to 3 million USD in 2002.

The export of vegetables and fruits decreased to 13%, and it still fall behind with 25% in 2001 compared to 1997. This sector remained, however, the most important one in our expot to Russia: our export amounted to 96 million USD in 2002. The importance of pigmeat and colza oil diminished, but that decrease was compensated by the improvement of soured and tinned vegetable exports.
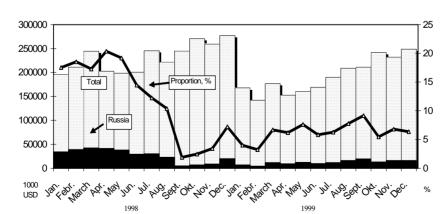
Therefore, we obviously have to examine the question how the increase of food aid shipments from our competitors to Russia affect the decrease of our export (and how the decrease of our export affects the increase of the shipments of food aid).
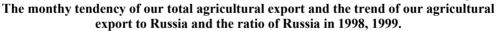
The share of cereals is really significant in food aid. Our cereal crops exports declined, however, by 80% from 1997 to 1998, the volume slowly reaches the degree that of the pre-crises. The exports volume of meat remained modest: it only took up 15% in 2001 of the 1997's. The trend of the animal and vegetable fats, the animal food products, the beverages, the alcohol and the vinegar exports is similar to that of the the meat, their share was 8%, 11% and 7%.

The volume of our imports has been at a low level for a long time, it was 3% of the exports and 0.2% of the total imports in 2002: 2,5 million USD. Nevertheless, the modest development until 2001 can be related to the improvement of the Russian production and the growth of international competiviteness, the development of the inner market, and the state of our decreasingly competive market. We do not have to be afraid of significant increase in import, as the volume of import is really modest, even after the increase in 2002. In our imports animal feed has important role.

The crises affected mainly our exports products, while the small imports was not affected significantly.
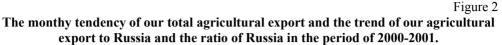
Figure 1

**The monthy tendency of our total agricultural export and the trend of our agricultural export to Russia and the ratio of Russia in 1998, 1999.**
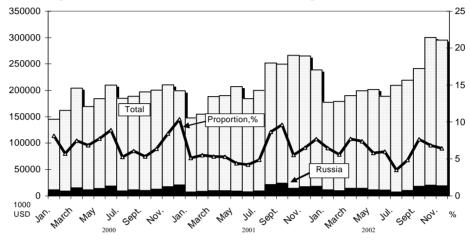


Source: AKII, 2002

Monthly statistics show that our export to Russia improved in the second half of 2001, and the increase occured again in the end of 2002, after a slight decrease in the first half of the year.

Figure 2

**The monthy tendency of our total agricultural export and the trend of our agricultural export to Russia and the ratio of Russia in the period of 2000-2001.**



Source: AKII, 2003

*The share of Russia in our total agricultural export was 6%, and from our imports was 0,4% in 2001.* The share of Russia from our export was fluctuating (12-14%) to 1998, after this date it declined sharply to 50%, and it seems to become stable on the 6-7% low level. The share of Russia regarding its measurement, proximity, and former share is really insignificant. This can be seen on table 2.

Table 2

**The ratio of Russia to the Hungarian total agricultural trade, 1991-2001, million USD**

| Year | Our total agricultural trade | | | Our agricultural trade to Russia | | | The ratio of Russia, % | | |
|---|---|---|---|---|---|---|---|---|---|
| | Exports | Imports | Balance | Exports | Imports | Balance | Exports | Imports | Balance |
| **1994** | 2307 | 1060 | 1247 | 338 | 3 | 335 | 14,63 | 0,28 | 26,83 |
| **1995** | 2901 | 978 | 1923 | 405 | 3 | 402 | 13,96 | 0,34 | 20,89 |
| **1996** | 2746 | 940 | 1806 | 326 | 2 | 323 | 11,86 | 0,25 | 17,90 |
| **1997** | 2849 | 1087 | 1762 | 435 | 5 | 430 | 15,27 | 0,41 | 24,43 |
| **1998** | 2772 | 1198 | 1574 | 317 | 4 | 313 | 11,44 | 0,34 | 19,89 |
| **1999** | 2310 | 995 | 1315 | 147 | 3 | 144 | 6,36 | 0,30 | 10,95 |
| **2000** | 2256 | 1017 | 1239 | 164 | 4 | 160 | 7,26 | 0,39 | 12,89 |
| **2001** | 2541 | 1132 | 1409 | 159 | 5 | 154 | 6,26 | 0,44 | 10,93 |
| **2002** | 2668 | 1306 | 1362 | 167 | 2 | 165 | 6,25 | 0,14 | 12,11 |

Source: AKII, 2002

*The distribution of the Hungarian agricultural export to main markets* shows, in the table 3, that 90% of our total agricultural export goes to European markets. The eliminated volume of our export owing to Russian crises contributed to the decrease of our total export. Therefore, it also contributed to the improvement of the share of our Central-European and mainly Western-European markets in our total export. The share, just like the volume of our export to Russia halved. We can count on the stabilization of the share of Russia in our export, due to the relatively stable trend and structure of our export. The share of our export to NIS countries (without Russia) in our total export was really fluctuating. Their share decreased significantly, however, the fluctuating trend remained after 1998 too. The share of our export to the NIS countries decreased as a consequence of the weakening trend of our export mainly to Russia and Ukraine. The share of the NIS countries in our export nowadays, is the fifth part of the volume of the 1980's, those share was more than 30%.

Table 3

**The distribution of the Hungarian agricultural export, 1994-2001**

| Year | EU | EFTA | East - Europe (including CEFTA, and Russia) | *CEFTA* | *NIS (including Russia)* | *Russia* | NIS (without Russia) | Other markets |
|------|------|------|------|------|------|------|------|------|
| **1994** | 43,4 | 11,3 | 38,9 | *12,3* | 22,0 | **14,6** | 7,4 | 6,4 |
| **1995** | 43,3 | 2,2 | 39,8 | *14,8* | 25,0 | **13,9** | 11,0 | 14,7 |
| **1996** | 47,4 | 2,0 | 34,8 | *14,6* | 20,0 | **11,9** | 8,1 | 15,8 |
| **1997** | 40,6 | 2,0 | 39,4 | *17,6* | 23,1 | **15,3** | 7,8 | 18,0 |
| **1998** | 43,7 | 2,1 | 39,6 | *19,5* | 16,1 | **11,4** | 4,7 | 14,6 |
| **1999** | 49,6 | 2,0 | 40,3 | *20,5* | 8,9 | **6,4** | 2,5 | 8,0 |
| **2000** | 46,5 | 2,0 | 42,5 | *21,0* | 10,4 | **7,3** | 3,1 | 9,0 |
| **2001** | 48,0 | 2,6 | 41,9 | *21,3* | 8,3 | **6,3** | 2,0 | 8.2 |

Resource: ARH, AKII, 2002

Russia, having lost its second most important position in our export, degraded to the fourth position. Russia is preceded by Germany, Italy and Romania. It is an interesting phenomenon that our agricultural trade balance is less positive with the far less developed, so less competitive Russia, than with the EU. Germany takes up 20 percent of our total agricultural export and 40% of our agricultural export to the EU. Other countries are left behind significantly.

Food shipments (coming from the USA and the EU, in form of aid or credit) contributed signifiquantly to the decline of our export. The sad thing is that our export is still half as big as it was in 1997, while wealthier countries reach the level of exportation of 1997 thanks to the positive effect of food aid. Since the level of our exportation is really low for ages, and there is no sign of remarkably positive change in our competitiveness; **the low level of our export to Russia seems to remain constant for a long time.**

The significant drawback in our competitiveness (compared to the Western trade partners of Russia) becoming obvious after the crises. It resulted considerable decrease in our export, and the negative effects for our export and disadvantages for our economy will takes for long time.

Table 4

**The food aid of the USA to Russia 1998-2002**

| Fiscal year | Thousands of USD | Main commodities |
|---|---|---|
| 1998 | 14000 | Wheat, soya bean |
| 1999 | 15900 | cereal crops, soybean |
| 2000 | 97000 | Wheat flour, rice, vegetable oil, soybean, pulses, seeds, meats |
| 2001 | 40234 | .. |
| 2002 | 32642 | .. |

Source:USDA-ERS

Table 4, 5, 6, show the volume of the aid shipments coming from the USA and the EU.

We may expect, after the EU accession that the weakness of our competitiveness compared to the EU may lead slowly to roughly similar results that we had to suffer because of the Russian crisis. The grave deficiency appeared right after the crisis not only in Hungarian export, but in connection to the USA and the EU, as well. It deserves attention that while the USA and the EU reach the pre-crisis level of exportation (90%) at a quick pace, Hungary still struggles for keeping the 50% of the level of the 1997's.

Table 5

**Exports from the USA to Russia**

| Calendar year | Million USD |
|---|---|
| 1997 | 1199 |
| 1998 | 834 |
| 1999 | 728 |
| 2000 | 580 |
| 2001 | 917 |

Source: USDA-ERS

Table 6

**Exports from the EU to Russia**

| Calendar year | Million EUR | Million USD |
|---|---|---|
| 1997 | 5386 | 4749 |
| 1998 | 3879 | 3460 |
| 1999 | 2743 | 2571 |
| 2000 | 2547 | 2756 |
| 2001 | 2883 | 3219 |

Source: EUROSTAT

2.2.2. The effects of Russian crisis in the years after the crisis

The Russian crises make Hungarian export feel the effects of the crises in the short and middle term and in the long run.

**In the short term**: Our export to Russia declined drasticly, after the months following August, 1998. In the beginning export decreased mainly because of general

insolvency, not because of the loss of market owing to food aid packages. The loss was, however significant in the short term, the real effect of the crisis was yet to come in the middle and long term.

**In the middle term**: The attempts to solve the problems of the regions in need after the crises in 1998-2000, were more or less suitable for alleviating successfuly the food insecurity, and for achieving truly humanitarian aims. Hungary could not take part in food aid shipments. On the one hand Russia asked for aid of donor countries referring to food insecurity owing to bad weather conditions, but on the other hand Russia was obliged to purchase food according to its duty towards creditors. We can still experience the disadvantageous effects of that nowadays: new trade relations become firmly rooted after the crisis and they will remain afterwards, when economic situation in Russia recovers and economy starts to develop. We (will) lose these markets because our fellow competitors acquired good positions for a long time in contrast with us.

**In the long run**: The question of vital importance is partly that how wealthier countries, (who provided food aid: EU and the USA) could find market, and how we can rekindle the traditionally good trade relations with Russia. We expect that unfortunately it will be difficult to rebuild trade relations.

The products of our competitors from wealthy countries came to the front so much in Russia - thanks to the application of special tools: credits, state guarantees, subsidies, humanitarian freights, state financed aid - that our traders can not even appeal to traditional good trade relations. Our products lag behind not only in reputation in comparison with western products but what is worse, are backward in competitive price too, and in the consumer's decision, however these are the main factors. Nevertheless, the continuous support of trade relations and relations with the consumer is indispensable, just like in case of reminder publicity (which is essential too, if we still count on Russian market), finding new trade partner/customer and establishing new connections is much more difficult and expensive, than reviving old but available contacts. Personal relations, the reputation of Hungarian products fade as time elapses. We may not neglect the relationships of that generation, who promoted successfuly our interests in our eastern markets and that may serve as a basis of our return. We have to provide the background of the presence of Hungarian products with a more powerful and concentrated marketing.

Beside the improvement of trade relations towards the EU, we have to take into account during the development of the agricultural strategy, that although we are backward in capital compared to our competitors, the geographical proximity and the traditional good relationship predestined us to take advantage of the possibilities that is provided by the Russian market.

## Conclusion

The disadvantages of side effects of food aid shipments, which cause distortion in the international trade, on the whole, hopefully will decrease, due to that the overall regulation will be more and more developed, and as a result of the continuous negotiation between the EU and the USA, and the protest of less rich countries. Consequently the importance of food aid packages will be forced back (except in critical (emergency) cases, when their use will inevitable) in solving the problem of food insecurity, so harmful effects originating from the employment of food aid will lessen that helps to the aim of WTO: free and fair trade come true.

The role of food aid shipments will more and more diminish in the decisions that serve the alleviation of food insecurity. This phenomenon may related to the increasingly rigorous regulations (that make the materialization of trade interest more difficult, so business will not show interest in applying food aid, as a tool of trade), or it may related to that donor countries or enterprises found more effective tools, or they found not yet regulated areas, to achieve they goals in the market. It is out of the question, that the decrease of the food insecurity would be the reason for the declining trend of the application of food aid.

The continuous application of aid is favourable *for the donor country (USA, EU)* who supports the country in need, in the long run, since, in this case, apart from the fact that it can reduces also its surpluses, it provides the presence for the representatives of the donor country by the time the recipient country becomes developed enough to be a solvent trade partner. The employment of food aid is in the interest of *the recipient country's (Russia)* only in the short term, until it recovers, because the application of food aid in the long run hinders the development, the growth of the inner market. The application of aid is less advantageous for the country that is not so wealthy, as it was left out from the helping process, because its modest possibilities, so it is condemned to the role of observer of the sad process of the loss of its former markets.

We may hope that after joining the EU, we can take part in the process of providing supports for the less developed countries, thus we will benefit from the advantages of this kind of „charitable" activity. The low level of our initial subsidies in comparison with the present member states of the EU, may fix our competitive backwardness, and freeze our disadvantageous position for a long time, not only in Russia but in the inner market of the EU, as well. The latter case may not be so rapid, and spectacular, than our loss were during the Russian crisis, but regarding its outcome in the long run, it may be even more serious, since our inner market can be also endangered.

Russia has got over the crisis by now, its inner market almost recovered and its competitiveness improved, this is backed up by the fact that our import originating from Russia increased in a modest but determined manner by 2001. It is unlikely that Russia will need food support thus in the near future we have to concentrate on the markets that were obtained by our competitors during the crisis.

Our powerful appearance in the eastern markets would be a great leap forward to reaching the former presence on the Russian market again that provides many possibilities for our agricultural export in the future.

## Acknowledgement

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