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**THE PROCESSES OF THE HUNGARIAN CEREAL SECTOR – WITH
SPECIAL REGARD TO THE WHEAT AND MAIZE SECTOR – AFTER THE
ACCESSION OF HUNGARY TO THE EUROPEAN UNION**

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1. INTRODUCTION

1.1. The Significance and Actuality of the Topic

„No race can prosper until it learns that there is as much dignity in tilling a field as in writing a poem.”

(Booker T. Washington)

The accession to the European Union was a milestone for Hungary and caused important changes in the cereal sector. By means of the accession to the EU, Hungary became a member state of the Community having 450 million consumers, which is one of the biggest cereal markets around the world. The regulations and subsidy system related to the cereal sector have been changed, the cereal intervention system came into force, and many trade barriers came to an end. These changes had a significant effect on the profitability of the cereal sector as well. The four years taken since the accession to the EU is a short period with regard to the speciality of the agriculture. But it is long enough to esteem the effect of the EU-accession on the cereal sector (with special regard to the wheat and maize sector) in Hungary. It is difficult to rule out the fluctuation in the harvested products caused by the variability of weather conditions but we can draw conclusions from certain factors regarding the direction and the degree of changes. The knowledge of these processes may give a point of reference to the market players functioning successfully in the future. The above-mentioned factors present **the actuality of my topic**.

The cereal sector of Hungary (in particular the wheat and maize market) deserves attention not only compared to the cereal sector of the EU but to that of the World as well. There is cereal harvested on 3 million hectares in Hungary which is 0.4% of the 700 million hectares harvested area of the world and 5% of the EU's 60 million hectares cereal growing area. Hungary contributes with 13 million tons to the total 2 billion tons cereal production of the world. The Hungarian cereal production amounts 4% of the EU-27's production, which is 270 million tons. The cereal yield in Hungary is above that of the world and nearly the same as that of the EU-27. Wheat and maize are the most important cereals in Hungary. The significance of Hungary in wheat and maize production of the world is bigger than in the cereal production of the world. The share of Hungary in the wheat and maize harvested area of the world is less than 1%, but the share in the wheat and maize production is 1-1%. The contribution of Hungary to the wheat harvested area and production of the EU-27 is 4-4%. The significance of Hungary in the maize production of the EU-27 is bigger, 12% in the area and in the production as well. The importance of Hungary in the cereal market of the world is bigger than that in the production. 1-1% of the cereal and wheat export but 2% of the maize export around the world starts from Hungary. Hungary's share in the cereal and wheat export of the EU-27 is 4-4% and 12% in the maize export. Hungary is well placed in the ranking list of the cereal exporter countries in the world thanks due to the intense concentration. Hungary is the 16th cereal, 12th wheat and 7th maize exporter country of the world. The above-mentioned figures demonstrate well the position of Hungary in the cereal market of the world and EU-27. Hungary is a small market player in the world considering the harvested area, the production and the export. But it is a medium-sized market player in the EU-27 in view of the cereal and wheat market meanwhile it is an important market player in the maize market of the EU-27. The significance of the Hungarian cereal sector is demonstrated not only by its share in the EU-27's and the world's cereal sector but by its share in the Hungarian agriculture. The share of the cereal sector in the value of output of the Hungarian agriculture is 20%. The cereal sector gives 20% of the total agricultural export and external trade balance. **The share of the Hungarian wheat, maize and cereal sector in that of the world and the EU, and its role in the Hungarian agriculture demonstrate well the significance of the topic.**

Hungary had the opportunity to make decisions referring to the agriculture and cereal sector by oneself –considering certain external factors- before the EU-accession. Hungary made decisions -concerning subsidies- independently from the other member states. Experts presumed before 2004 that the cereal sector is one of the beneficiaries of the EU-accession, the cereal intervention and direct payments give an extra value to the sector and the CAP makes sure the sale and the profitability of cereals.

The accession to the EU caused many novelty for the cereal sector. Deep researches are necessary to judge the positive and negative effects of the EU-accession. I formulate my objects in the interest of exploration whether happened changes in the Hungarian cereal market -in particular wheat and maize market- after the EU-accession, and if yes what kind of changes were these. The Hungarian wheat and maize harvested area and production cover 90% of the cereal harvested area and production. Based on this fact the results of researches in the wheat and maize sector are applicable to the total Hungarian cereal sector. I aspire to get objective results about the processes in the cereal sector.

1.2. Objectives

My aim was to demonstrate **the position of the Hungarian cereal sector –with special regard to the wheat and maize sector- within the cereal market of the world and the EU.** If we know the processes of the cereal market in the world and in the EU, than we are able to know much better the Hungarian cereal market and its processes.

I aspire to study and demonstrate wide-ranging aspect of the processes and changes **in the Hungarian cereal particularly wheat and maize market.** I intend to outline the status and regarding rules of the cereal market before the EU-accession, and esteem the changes after that. I focused on the changes in the regulation, production, consumption, trade and financial conditions and on the causes of these changes. My purpose was to study and demonstrate these changes and to esteem their effects.

I intend to demonstrate my results and the processes of the Hungarian cereal, especially wheat and maize market after the EU accession by means of answering the next seven question:

- Had the EU-accession any effect on the Hungarian wheat and maize sowing area and production?
- Did happen any changes in the Hungarian wheat and maize consumption since the EU-accession?
- Did the EU-accession produce any effect on the cereal export of Hungary? Did Hungary successfully integrated in the common cereal market?
- Had the EU-accession any effect on the fluctuation of the producer-procurement prices of wheat and maize and on their price-ratio in Hungary?
- Have the returns, costs and income of the cereal production changed in Hungary?
- Did the Hungarian cereal producers changed the timing of wheat and maize sale?
- How much extra returns did the players of the Hungarian wheat and maize market realize?

2. MATERIALS AND METHODS

In accordance with the rule of the Ph.D. school there are two main chapters in my dissertation beyond the introduction and conclusions. These two chapters are the survey of the scientific literature and the results.

Where I mention “cereal” there I investigate the whole cereal sector (wheat maize, barley, rye etc all together). But I investigate some processes (e.g. producer-procurement price, sale practice) based on the single type of cereals in order the better recognition. In the last-mentioned case I investigated the wheat and maize market. We can conclude to the whole cereal market from these results.

I reviewed and analyzed the scientific literature, collected and processed data, applied statistical calculations, model calculation and SWOT-analysis.

1. The Review and the Analysis of the scientific literature

I reviewed and analyzed the scientific literature in order to understand the processes of the cereal sector. I applied first of all the studies of the Agricultural Economics Research Institute (AKI), the OECD, EUROQUALITY and EC DG AGRI and I completed this with the opinion of Hungarian and foreign specialists. I outlined the changes in the regulation based on the review of the relevant laws.

2. Data collection

I collected statistical data from the database of the AKI, FAOSTAT, Hungarian Central Statistical Office (KSH), Hungarian Central Bank (MNB).

I used mainly data of the period 1990-2006 for the analysis of the harvested area, production, export, import, prices. This way I was able to investigate a longer period and esteem the processes of the cereal market after 2004 with the knowledge of former trends.

3. Data Process and Analysis

I processed, classified and analysed these data by Microsoft Excel. I created figures to present the progresses and trends. I used MINITAB for Windows to explore the connections between the single factors.

4. The Statistical Methods

I used statistical methods to prove the producer-procurement price increasing effect of the EU-accession on the Hungarian wheat and maize market. I used Microsoft Excel and Minitab Release 12 for Windows to the calculation. I reviewed some relevant scientific literature (HARNOS edit. 1993, KEMÉNY – DEÁK 1998, STATSOFT, INC. 2007) and used correlation and regression analysis to the calculation. The general purpose of correlation and regression analysis is to learn more about the relationship between two or more variables. First of all I determined the vital few dimensions, which have effects on the Hungarian cereal prices. Than I created a linear equation using data before the EU-accession. After this I calculated the wheat and maize price in Hungary using the values of the independent variables after 2004 presumed the omission of the EU-accession. I considered the difference between the prices calculated this way and the actual prices as the producer-procurement price increasing effect of the EU-accession. I esteemed the results on the basis of the above-mentioned scientific literature. I summarize the most important knowledge

necessary to esteem my result in what follows. Correlation coefficients can range from -1.00 to +1.00. The value of -1.00 represents a perfect negative correlation while a value of +1.00 represents a perfect positive correlation. A value of 0.00 represents a lack of correlation. I used the variables of the correlation matrix as the independent variables (x_1, x_2, \dots, x_n) of the linear equation (form: $y = b_0 + b_1x_1 + \dots + b_nx_n$). I tried to create the equation which fits the best to the Hungarian wheat and maize producer-procurement prices. The goal of linear regression procedures is to fit a line through the points, so that the squared deviations of the observed points from that line are minimized. The Student's t distribution (T) demonstrates the significance of the independent variables. Those variables are significant where P is small or T is high. The *R-square* value is an indicator of how well the model fits the data. The smaller the variability of the residual values around the regression line relative to the overall variability, the better is our prediction. R-sq adjusted is for degrees of freedom. If a variable is added to an equation, R-sq will get larger even if the added variable is of no real value. To compensate for this, Minitab also prints R-sq (adj). This is an approximately unbiased estimate of the population R-sq, and is calculated by the formula.

Another significant conclusion of my researches is that it is not adequate to use calendar year data during the investigation of market prices. I created an average from the monthly data for the marketing year (July/June for wheat and October/September for maize). I discounted this marketing year average prices to the year 1990. I calculated with the prices in Euro of 17 countries in case of wheat, and 10 countries in case of maize and the minimum, maximum and average prices of the EU-15 during the analysis of price increasing effect of the EU-accession through European prices. I used the data of EUROSTAT of the period 1993-2006.

5. Model calculation

Model calculation is necessary to the scientific recognition (HUZSVAI et al. (2005)). Natural and agricultural processes are very complex, thus simply methods are not adequate. The aim of the model is the demonstration and study of the original phenomenon.

I build a model to study the effect of the EU-accession on the Hungarian wheat and maize market. I determine the extra income due to the accession. I determine the amount of direct payments, the amount of the difference in the producer-procurement prices, the extra income and extra storage fee of the intervention in Hungary. I demonstrate the sources and the beneficiaries of these amounts as well. I investigate the wheat and maize market data in 1990-2007 separated and summarize the results after this. I calculated the extra income pro hectare and pro ton as well. I used the data of the AKI, MVH and KSH to the calculation. I made my calculations and model with Microsoft Excel.

6. SWOT-analysis

I complete my result with SWOT-analysis. SWOT is an abbreviation for Strengths, Weakness, Opportunities, Threats. The SWOT-strategy tries to find the agreement between the environment and the internal resources (ROÓZ (2007)).

The SWOT-matrix of the Hungarian cereal sector summarizes the results of my investigations. Analysis and estimation of experts are used to the SWOT-matrix. It is necessary to define the 8-10 most significant factors and their effects and put them in the boxes of SWOT-matrix (ROÓZ (2007)). My aim was with the creation of the SWOT-matrix, to spotlight on the strengths, weakness, opportunities, threats of the Hungarian cereal market and to demonstrate what adequate and what necessary to change is.

3. RESULTS

I summarize the results of my research in the following.

The cereal sector has significance within the Hungarian agriculture. The role of the cereal sector within the Hungarian agriculture is indicated by its contribution to the agricultural output, export and land-use. The accession of Hungary to the European Union caused important changes in the cereal sector. By means of the accession to the EU, Hungary became a member state of the Community having 450 million consumers, which is one of the biggest cereal markets around the world. The regulations and subsidy system related to the cereal sector have been changed, the cereal intervention system came into force, and many trade barriers came to an end. These changes had an effect on the profitability of the cereal sector as well. On the base of the above-mentioned factors I attach significance to the analysis of the processes in the Hungarian cereal sector (in particular the wheat and maize market) after the EU-accession. The knowledge of these processes may give a point of reference to the market players functioning successfully in the future.

I studied the scientific literature to understand the processes in the cereal sector. On the base of the relevant rules I outlined the changes in the regulation. I used the data of Hungarian Agricultural Economics Research Institute (AKI), FAOSTAT, EUROSTAT, Hungarian Central Statistical Office (KSH) and Hungarian Central Bank (MNB). I applied statistical methods to prove the effect of the EU-accession on the market prices. I demonstrated through a model calculation the extra income of the cereal sector referable to the EU accession. I completed my results with the SWOT analysis of the cereal sector.

I pointed out on the base of my analysis that the related rules changed significantly in Hungary. The rules related to the agriculture and rural development in the EU came into force in Hungary in 2004, so national rules contrasted with that became invalid. Hungary had some derogation of law meanwhile there is a transition in direct payments.

I focused in my study on the analysis of the Hungarian wheat and maize production, consumption, external trade and income. My researches resulted in that the sown area of wheat and maize in Hungary was stabilized about the turn of the millennium and there were no changes in the structure of sown area. On the other hand the contribution of maize to the total cereal production has risen meanwhile the share of wheat has fallen. The cause of this shift is the favourable weather condition. The decrease of the domestic cereal consumption continued after 2004, but the rate of the loss reduced. The structure of the external markets for the Hungarian wheat and maize has changed. The share of the export to the EU-15 in the total cereal export of Hungary increased significantly after the EU-accession. This fact proves that the Hungarian cereal is competitive in bigger distance after the fall of the trade barriers. In this period the Hungarian producer-procurement prices got closer to the prices of the EU-15. I esteem this changes that the integration of Hungary to the cereal market of the EU has started. The export was driven by the carrying away of the internal surplus and market players did not aimed to satisfy purposefully and systematically the demand of the regions having shortage in cereals. The income of the cereal production changed significantly. The value of wheat and maize production per hectare has jumped up since 2004. The main cause of this is the direct payments. The income per hectare has risen significantly because of the jumping up of production value and the moderated increase of production costs.

I created a model calculation to demonstrate the extra income of the players in the Hungarian wheat and maize market after the EU-accession. The amount of the extra income during the period of 2004-2007 was HUF 360 billion i.e. HUF 40,000 per hectare each year. Three factors caused these extra income. These factors are the direct payments, the price increasing effect of the EU-accession and the intervention system. The sources of this extra income are the budget of the EU and Hungary and the consumers, meanwhile the beneficiaries of this extra income are the cereal producers, the cereal traders and the store-operators.

My study includes conclusions and suggestions. I mean that market players could obtain more extra income if they would be able to get to the markets having higher prices through the liquidation of logistic difficulties and the more purposive satisfaction of the market demands. Furthermore cereal producers could improve their income through the careful timing of the sale of their product. Producers sold 70 percent of the wheat and maize sold in the marketing years in the first three months after harvest in the period of 2004-2007, similarly to the practice before the EU-accession.

The stable high income caused by the cereal CMO is able to establish the profitable wheat and maize farming in the next years. Because of this producers are able to prepare for the challenges caused by the increase of the production costs, the decrease of the real cereal producer-procurement prices, the new and old competitors.

In the end I esteem my researches so that I was able to demonstrate the main processes of the Hungarian wheat and maize market after the EU-accession and to create conclusions applicable in the practice. It is workable to conclude the processes of the whole Hungarian cereal market based on my results, as wheat and maize almost totally cover the whole Hungarian cereal market.

4. NEW AND RECENT SCIENTIFIC RESULTS

Considering the objectives formulated in the introduction I summarize my new and recent scientific results of my researches in what follows:

- The wheat and maize sowing area was equalized after the millennium. The structure of the cereal sowing area did not change after the EU-accession.
- The Hungarian cereal consumption decreased after the EU-accession following the trend before that, but it slowed down.
- The share of the EU-15 within the target countries of the Hungarian cereal export increased to 60% from 27% after the EU-accession. This fact proves that the Hungarian cereal is competitive in bigger distance after the fall of the trade barriers. In this period the Hungarian producer-procurement prices got closer to the prices of the EU-15. I esteem these changes that the integration of Hungary to the cereal market of the EU has started.
- Wheat started to become cheaper compared to maize long before the EU-accession. Wheat was many times by 40-50% more expensive than maize before 2000, but after this the market players priced wheat only by 20-30% over the maize. The price equalizing effect of the intervention is well observable in the intervention period of 2005 and 2006. In the years after that the intervention was not an alternate distributing channel and the price of wheat was above that of maize by 20-30% again.
- The value of wheat and maize production per hectare has jumped up since 2004. The main cause of this is the direct payments. The income per hectare has risen significantly because of the jumping up of production value and the moderated increase of production costs. The income per hectare of wheat and maize was equal on the average of 1999-2003. But the income of maize was by 50% above that of wheat on the average of the period 2004-2007.
- The players of the wheat and maize market obtained HUF 130 billion and HUF 100 billion in 2004 and 2005 and HUF 60-60 billion in 2006 and 2007 extra income. These amount to HUF 40,000 per hectare in the first two years and HUF 30,000 per hectare in 2006 and 2007, which is 20-40% of the returns per hectare. This extra income is equal with HUF 5,000-9,000 per ton. The total extra income of the period 2004-2007 is HUF 360 billion. Cereal producers realized the most of it (HUF 290 billion) as direct payments and the price increasing effect of the EU-accession. The main beneficiaries of the remaining HUF 70 billion are the cereal traders and the store-operators and only a small part of it streamed to the wheat and maize producers.
- Producers sold 70% of the wheat and maize sold in the marketing year in the first three months after harvest in the period of 2004-2007, similarly to the practice before the EU-accession.

5. CONCLUSIONS AND SUGGESTIONS

5.1. Conclusions

I created conclusions applicable in the practice, which can help market players to prepare for the challenges of the future and to understand the occurrence of the past. Considering the objectives formulated in the introduction I summarize the conclusions and suggestions of my researches in what follows:

1. Had the EU-accession any effect on the Hungarian wheat and maize sowing area and production?

- The wheat and maize sowing area was equalized after the millennium and both of them amount about 1.1 million hectares since then. The structure of the cereal sowing area was stabilized long before the EU-accession it did not changed after the EU-accession.
- On the other hand the contribution of maize to the total cereal production has risen meanwhile the share of wheat has fallen. The cause of this shift is that the yield of maize fluctuates much better than that of wheat depending on the weather conditions. The yield of maize is higher in favourable weather condition. If weather conditions are favourable the total quantity of the harvested maize in Hungary exceeds that of wheat considerably even so the harvested areas are equal. If weather conditions are less favourable the harvested quantities are nearly equal.

2. Did happen any changes in the Hungarian wheat and maize consumption since the EU-accession?

- The decrease of the domestic cereal consumption continued after 2004, but the rate of the loss reduced.
- The domestic wheat consumption was stable without trend effect after the EU-accession. The cause of this stability is that the food and the feed consumption of wheat changed in the contrary direction in the extreme years.
- The fall of the domestic maize consumption for feed caused the reduction of the domestic cereal consumption. But its effect was compensated to a certain extent by the dynamic increase of the food consumption of maize.

3. Did the EU-accession produce any effect on the cereal export of Hungary? Did Hungary successfully integrated in the common cereal market?

- The export stock of cereals increased after the EU-accession because of the extremely high harvested quantity and the unbroken decrease of the domestic consumption. The share of the export to the EU-15 in the total cereal export of Hungary increased significantly at the expense of the export to the EU-10 and third countries. The share of the export to the EU-15 increased from 27% to 60% meanwhile that to the EU-10 and third countries decreased from 20% to 12% respectively from 39% to 20%. The cereal export of Hungary to the neighbouring countries (Bosnia, Romania, Slovenia) decreased significantly. This fact proves that the Hungarian cereal is competitive in bigger distance after the fall of the trade barriers.
- The medium-sized export markets has bigger and bigger share in the total Hungarian cereal export, meanwhile the role of the large and small export markets decreased. I esteem this diversification as a favourable change, because Hungary depends in a less degree from the actual import demand of certain large cereal importer countries.

- The producer-procurement price of wheat and maize decreased in the E-15 but increased in Hungary between 1990 and 2007. The producer-procurement price of wheat in Hungary has been above the minimum of that in the EU-15 since 2003. In case of maize this has been the same since 2004. The trend in the producer-procurement price of wheat and maize in Hungary correspond to the price trend in the EU-15 after 2004. The price differences in the EU-15 decreased significantly.
- I esteem the changes of the export markets and the producer-procurement prices so that the integration of Hungary to the cereal market of the EU has started. But there are many challenges as the producer-procurement prices in Hungary are about only the minimum of that in the EU-15. Furthermore a significant quantity of the cereal export stock was transferred to the intervention stores instead of export.

4. Had the EU-accession any effect on the fluctuation of the producer-procurement prices of wheat and maize and on their price-ratio in Hungary?

- The fluctuation of the producer procurement price of wheat in the marketing year decreased slightly meanwhile that of maize increased. So the fluctuation of prices in the marketing year is important at present as well, so it is worth to store the cereals and sell it long after the harvest.
- The difference between the producer procurement price of wheat and maize decreases usually in the period of July-September. In certain marketing years wheat was cheaper than maize in the mentioned period. There was no change after the EU-accession in this respect.
- The ratio of the producer-procurement price of wheat/maize started to decrease long before the EU-accession. Wheat was many time by 40-50% more expensive than maize before 2000, but after this the market players priced wheat only by 20-30% over the maize. The mechanism which prevented the breaking away of the producer-procurement price of wheat from that of maize does not work any more because of the abolition of the maize intervention.

5. Have the returns, costs and income of the cereal production changed in Hungary?

- The decrease of the real value of gross production per hectare of cereals stopped around the EU-accession. The yields of cereals fluctuated in a wider interval than the returns per hectare. The cause of this is that the producer-procurement price decreases the fluctuation of the returns caused by the changes of the yields.
- The returns of wheat per hectare was higher in the years with lower yields than in the years with higher yields. There is no similar connection in the returns of maize. One likely cause of this is that market players are willing to pay a much higher price for breadwheat in the years with low harvested quantity. But maize is a feed cereal so it is easier to substitute that, so the price of maize do not increase in such a degree like that of breadwheat.
- The value of gross production of wheat and maize per hectare has jumped up since 2004. The cause of this is direct payments first of all. The degree of growth in the cost of production per hectare has increased. But that degree of growth in the cost of production per ton has decreased since 2004. This means, that it is not obvious that the production costs increased after the EU-accession. The income of cereal production per hectare has increased significantly due to the jumping up of the value of the gross production and the moderated rise of the cost. Thus the profitability of the cereal production is very high compared to other agricultural activities. The profit ratio to the value of gross production of the wheat and maize production is about 20% after 2004 and this is far above that in the previous period.

- The income of wheat and maize per hectare was equal before 2004. But the income of maize per hectare was higher by 50% than that of wheat after the EU-accession. There were two years in which wheat production would have effected loss after 2004 but maize production would have been profitable in each year without direct payment. The cause of the difference in the income of wheat and maize is that the returns of maize per hectare was 1,5 times higher due to the higher yields than that of wheat meanwhile the difference in the production costs was much less.

6. Did the Hungarian cereal producers changed the timing of wheat and maize sale?

- The producer-procurement price fluctuate significantly in the marketing year so the timing of cereal sales influences importantly how much returns and income cereal producers realize. There were no changes after the EU-accession in the timing of cereal sales. 70 percent of the wheat and maize sold in the marketing years was bought up in the first three months after harvest in the period of 2004-2007. This is similar to the practice before the EU-accession. So cereal traders and users realize the profit caused by the rise of the prices. Cereal traders buy up cereal directly after harvest and export it later during the marketing year so realizing profit from the rise of the cereal price. The timing of sale is determined by the stores capacity, the market contacts, the liquidity and the habit of cereal producers.

7. How much extra returns did the players of the Hungarian wheat and maize market realize?

- The players of the wheat and maize market obtained HUF 130 billion and HUF 100 billion in 2004 and 2005 and HUF 60-60 billion in 2006 and 2007 extra income. These amount to HUF 40,000 per hectare in the first two years and HUF 30,000 per hectare in 2006 and 2007. This extra income is equal with HUF 5,000-9,000 per ton, which is 20-40% of the returns per hectare. The total extra income of the period 2004-2007 is HUF 360 billion. Cereal producers realized the most of it (HUF 290 billion) as direct payments and the price increasing effect of the EU-accession. The main beneficiaries of the remaining HUF 70 billion are the cereal traders and the store-operators and only a small part of it streamed to the wheat and maize producers.
- The above-mentioned amounts were financed from three sources. The most of it (HUF 217 billion) was financed by the common budget of the EU as SAPS, extra income of the intervention sale and partly the intervention storage fee. The top up, and the rest of the intervention storage fee was paid by the Hungarian national budget (HUF 117 billion). Consumers sponsored the extra income of market players caused by the higher market prices after the EU-accession (HUF 28 billion). The amounts paid by the EU were twice bigger than that financed by the Hungarian budget in each year. Consumer paid 23% of the extra income in 2004, but 0% in any other years.

A further conclusion of my researches is that linear regression is not the adequate method to create a function on the description of Hungarian producer-procurement cereal prices by the cereal production and consumption (i.e. supply and demand) of some country groups. But it is possible to create a function with linear regression to describe Hungarian producer-procurement cereal prices based on the prices in some European countries. The probability of the function for maize is better than that for wheat. The cause of this is that maize market is more homogeneous than wheat market. There are submarkets regarding the quality in the wheat market. Thus you must pay attention on these submarkets if you investigate wheat prices. Another significant conclusion of my researches is that it is not adequate to use calendar year data during the investigation of market prices and export-import data. It is necessary to create an average from the monthly data for the marketing year

(July/June for wheat and October/September for maize). But this is sometimes difficult because data in the adequate dissociation are sometimes not available.

5.2.Suggestions

The climate, the tradition of cereal production in Hungary and the fact that Hungary is a member state of the EU, one of the biggest cereal markets around the world, provide an opportunity for development in the Hungarian cereal sector.

Forecasts say that the food consumption in Europe does not exceed any more, so we have to prepare for the gradation of the competition. It is necessary to focus on the domestic and external demand. The production must be driven by the market demands and not by the available input factors.

The domestic producer-procurement prices are closely to the minimum prices of the EU-15. It would be possible to realize a rise in the income if we would be able to reach the markets with higher prices. To reach this aim it is necessary to solve the logistical difficulty, and to satisfy more advisedly the market demands. I suggest further researches to find the factors determining the Hungarian cereal producer-procurement prices and the connections between these factors. Knowing these factors and connections can help market players to calculate their income.

I suggest the producers to choose the time of sale more circumspectly. They can realize extra income by the sell of their products in more portion. Producers need stores and alternative distribution channels to achieve this objective. Producers are able to improve their purchase and sale method by increasing cooperation (producer groups) and by the alternate distributing channels (cereal stock exchange, Gabonet). Producers can improve their position in trade talks and can decrease their dependence from the local cereal traders and processors. Further investigations are necessary to answer the question why the producers did not change the timing of sale. Before answering the question we have to take into account the growth in the storage capacity of producers, the liquidity of producers, furthermore their distribution opportunity and connections.

The direct payments, the subsidies to investment, the cereal intervention and the huge common market make sure the distribution of cereals and the income of the production. All conditions are available to establish the profitable farming in the following years or decade. This is true even so if Hungarian farmers get less direct payments than the farmers of the EU-15. On the other hand the Hungarian cereal sector must prepare for the challenges of the future caused by the decrease of market protection, the abandon of intervention, the increase of agricultural land prices, rent and production costs, the decrease of cereal real price, the extension of GMO products, the increase of production in countries with huge potential (Ukraine, Romania). The stable high income in the last and the following years is a good basis for these preparations.

I think it is questionable if it is necessary to subsidise the cereal sector with HUF 20 billion each year from the national budget meanwhile it gets HUF 40 billions direct payments each years from the budget of the EU. I suggest to considering the redistribution of this amount in the other less subsidised sectors of the agriculture taking into account the conditions of the CAP.

Four marketing years passed since the accession of Hungary to the EU. I suggest to investigating some years later if my conclusions are acceptable knowing the occurrences of a longer period.

I was not able to investigate all aspects of the cereal market. So I suggest further investigations such as the processes of cereals beyond wheat and maize, the effects of changes in

the regulations on the prices and production (in Hungary and in the EU-27) and the changes in the quality parameters of cereals.

THE LIST OF PUBLICATIONS DIRECTLY AND INDIRECTLY CONNECTED TO THE RESEARCH

SCIENTIFIC ARTICLES

Published in foreign language

1. **Kató N.** – Jancsok Zs. (2006): Does Hungary Have any Interest in the Maintenance of Direct Payments? *Georgikon for Agduculture* 16 (1) 2006, ISSN 0239-1260, 13-33 pp.
2. Jancsok Zs. – **Kató N.** – Nógrádi J. – CSeke Z. (2008): The Questionable Necessity of Changing Maize Intervention, *Bulletin of the Szent Istvan University*, 2008., ISSN 1586-4502., 195-203 pp.

Published in Hungarian

1. **Kató N.** — Jancsok Zs. — Nógrádi J. (2006): Az első EU-s intervenció hatása a magyar gabonapiacra modellszámítás alapján, *Gyakorlati Agroforum*, 2006. 17. évfolyam 9. szám, ISSN 1416-0927, 44-46 pp.
2. Rieger L. – Jancsok Zs. – **Kató N.** – Nógrádi J. (2005): Az intervenció gabonafelvásárlás kezdeti tapasztalatai, *Európai Tükör*, 2005. június, X.évf. 6. szám, ISSN 1416-6151, 49-61 pp.
3. Rieger L. – Jancsok Zs. – **Kató N.** – Nógrádi J. (2005): A közraktározás lehetősége az intervencióban, *Gyakorlati Agroforum*, 2005. 16. évfolyam 5. szám, ISSN 1416-0927, 13-16 pp.
4. Rieger L. – Jancsok Zs. – **Kató N.** (2005): Gabonaintervenció – hogyan tovább? *Gyakorlati Agroforum*, 2005. 16. évfolyam 4. szám, ISSN 1416-0927, 44-46 pp.

SCIENTIFIC CONFERENCE PUBLISHED IN CONFERENCE PUBLICATION

Published in foreign language

1. Nógrádi J.- Cseke Z.- **Kató N.**- Jancsok Zs. (2007): Regional developments of intervention-buying in of cereals in Hungary int he first two economics years, 6th International Conference of PhD Students, Miskolc, 12-18 August 2007, ISBN 978-963-661-783 Ö, 307-313 pp.
2. Jancsok Zs. – **Kató N.** (2002): The cereal buying up sistem in the European Union and in Hungary- How can we prepare for accessing?
Gödöllő, 17-18. October, 2002., 2nd International Conference for Young Researchers, Szent István University Gödöllő, ISBN: 963 9483 05 2ö (ISBN 963 9483 06 9), 141-146. pp.
3. Jancsok Zs. – **Kató N.** (2002): The application-opportunity of the intervention system in cereal sector in Hungary before accessing the European Union
XLIV. Georgikon Napok, Nemzetközi, hazai agrárpolitikai és termékpiaci trendek, Keszthely, 2002. szeptember 26-27., (kiadványban abstract, CD-n full paper) 6 p.

4. **Kató N.** - Jancsok Zs. (2002): The overview and the comparison of the cereal buying up system in the European Union and in Hungary
XLIV. Georgikon Napok, Nemzetközi, hazai agrárpolitikai és termékpiazi trendek, Keszthely, 2002. szeptember 26-27., (kiadványban abstract, CD-n full paper) 7 p.
5. **Kató N.** - Jancsok Zs. (2001): The Present and the Future of Corn Market Regulation in Hungary
Gödöllő, 4-5. September, 2001., 1st International Conference for Young Researchers, Szent István University Gödöllő, ISBN: 963 9256 50 1, 158-162 pp.

Published in Hungarian

1. Nógrádi J.- Bánhegyi G.- Cseke Z.- Jancsok Zs. – **Kató N.** (2007): Az euró-forint árfolyam változásainak hatása az intervenció felvásárlásra
II. Pannon Gazdaságtudományi Konferencia, „A fenntartható fejlődés és vidékfejlesztés, II. Agrárpiazi folyamatok és a piacsabályozás eszközrendszere” szekció, Pannon Egyetem, Veszprém, 2007. június 7., full paper, kiadás alatt
2. Nógrádi J.- Cseke Z.- **Kató N.**- Jancsok Zs. (2006): Az intervenció felvásárlás regionális alakulása hazánkban
Fiatal Regionalisták V. Országos Konferenciája, „A regionális fejlődés új tényezői” szekció, Széchenyi István Egyetem, Győr, 2006. november 10-11., abstract
3. Nógrádi J.- Cseke Z.- **Kató N.**- Jancsok Zs. (2006): Az intervenció raktározás alakulása a Nyugat-dunántúli régióban
Fiatal Regionalisták V. Országos Konferenciája, „A regionális fejlődés új tényezői” szekció, Széchenyi István Egyetem, Győr, 2006. november 10-11., abstract
4. **Kató N.** – Jancsok Zs. – Nógrádi J. (2006): Az első EU-s gabonaintervenció egyenlege Magyarországon- modellszámítás alapján
XLVIII. Georgikon Napok, 48th Georgikon Scientific Conference, „Agrárgazdaság, vidék, régiók multifunkcionális feladatok és lehetőségek”, Az EU közös piaca, marketing szekció, Keszthely, 2006. szeptember 21-22., ISBN 963 9639 11 7, (kiadványban abstract, CD-n full paper) 7 p.
5. Nógrádi J. – Cseke Z. – **Kató N.** – Jancsok Zs. (2006): Az intervenció piaci hatásai
XLVIII. Georgikon Napok, 48th Georgikon Scientific Conference, „Agrárgazdaság, vidék, régiók multifunkcionális feladatok és lehetőségek”, Az EU közös piaca, marketing szekció, Keszthely, 2006. szeptember 21-22., ISBN 963 9639 11 7, (kiadványban abstract, CD-n full paper) 5 p.
6. **Kató N.** - Jancsok Zs. (2005): A felvásárlási és élelmiszerárak, valamint az agrárrolló alakulása EU-csatlakozásunkat követően
XLVII. Georgikon Napok és 15. ÖGA találkozó, Közép-Európa mezőgazdasága- lehetőségek és korlátok, Veszprémi Egyetem, Georgikon Mezőgazdaságtudományi Kar, Keszthely, 2005. szeptember 29-30. CD-tár: CD/GN 2005/Teljes anyag FORMÁZOTT/Kató N.doc, (kiadványban abstract, CD-n full paper) 7 p.
7. **Kató N.** - Jancsok Zs. (2003): Magyarország és Európai Unió mezőgazdaságának szerkezeti összehasonlítása
II. Erdei Ferenc Tudományos Konferencia, ISBN 963 7294 46 0 (ISBN 963 7294 48 1), Kecskeméti Főiskola, Kertészeti Főiskolai Kar, Kecskemét, 2003. augusztus 28-29., II. kötet, 193-197. pp.
8. Jancsok Zs. – **Kató N.** (2002): Az intervenció felvásárlás alkalmazásának lehetősége a gabona ágazatban Magyarországon az EU csatlakozásig
XXIX. Óvári Tudományos Napok, Agrártermelés- életminőség, Mosonmagyaróvár, 2002. október 3-4., ISSN 1585-616X, CD-tár: CD:/ Agrárökonomia Szekció/ Jancsok.pdf, (kiadványban abstract, CD-n full paper) 6 p.

9. Jancsok Zs. – **Kató N.** (2002): Az Európai Unió és Magyarország gabona felvásárlási rendszerének ismertetése és összehasonlító elemzése
XXIX. Óvári Tudományos Napok, Agrártermelés- életminőség, Mosonmagyaróvár, 2002. október 3-4., ISSN 1585-616X, CD-tár: CD:/ Agrárökonómia Szekció/ Jancsok2.pdf, (kiadványban abstract, CD-n full paper) 7 p.
10. Jancsok Zs. – **Kató N.** (2002): Az Európai Unió és Magyarország gabona felvásárlási rendszerének ismertetése és összehasonlító elemzése
Tavaszi Szél 2002, A Fialat Magyar Tudományos Kutatók és Doktoranduszok Hatodik Világtalálkozója, Gödöllő, 2002. április 12-14., abstract
11. Jancsok Zs. - **Kató N.** (2002): A közraktározás gyakorlata az Amerikai Egyesült Államokban és javaslat egyes elemeinek átvételére
Tavaszi Szél 2002, A Fialat Magyar Tudományos Kutatók és Doktoranduszok Hatodik Világtalálkozója, Gödöllő, 2002. április 12-14. abstract
12. **Kató N.** - Jancsok Zs. (2002): Magyarország és az Amerikai Egyesült Államok gabona közraktározási rendszerének összehasonlító elemzése
I. Országos Közgazdaságtudományi Doktorandusz Konferencia, Budapest, MTA, 2002. március 22-24. abstract
13. Jancsok Zs. – **Kató N.** (2001): A közraktári hitel szerepe az agrárfinanszírozásban
VII. Ifjúsági Tudományos Fórum
Veszprémi Egyetem, Georgikon Mezőgazdaságtudományi Kar, Keszthely, 2001. március 29. CD-tár : CD:/ Közgazdaságtan- Agrárközgazdaságtan Szekció, (kiadványban abstract, CD-n full paper) 6 p.
14. Jancsok Zs. – **Kató N.** (2001): A közraktári jegyes finanszírozás új perspektívái
Erdei Ferenc Emlékülés, Tudományos Konferencia, Agrárökonómia I. Szekció, Kecskeméti Főiskola, Kertészeti Főiskolai Kar, Kecskemét, 2001. augusztus 30., 117-122. pp.
15. **Kató N.** - Jancsok Zs. (2001): A gabonapiaci szabályozás az EU csatlakozás tükrében
Erdei Ferenc Emlékülés, Tudományos Konferencia, Marketing Szekció, Kecskeméti Főiskola, Kertészeti Főiskolai Kar, Kecskemét, 2001. augusztus 30., 244-249. pp.

OTHER ARTICLES

1. Jancsok Zs. – **Kató N.** (2001): Kibővítésre kerülnek a búza közraktározásához kapcsolódó támogatások, Pécs, 2001., *AGRONAPLÓ* V. évfolyam 7. szám, ISSN 1417-3255, 44. pp.

OTHER PUBLICATIONS

1. **Kató N.** (2006): A mezőgazdaság gazdasági szerepének alakulása EU csatlakozásunk után „Információs napok az Agropudencia Közhasznú Társaságnál 2006” szakmai program, Előadás, Budapesti Agrárkamara, 1073 Budapest, Dob utca 90., 2006. november 8.
2. **Kató N.** (2006): A 2004/2005-ös gabonaintervenció egyenlege Magyarországon- modellszámítás alapján, „Hogyan gazdálkodjunk sikeresen az EU-ban” szakmai program, Előadás, Budapesti Agrárkamara, 1073 Budapest, Dob utca 90., 2006. szeptember 27.
3. **Kató N.** (2005): A magyar mezőgazdaság teljesítménye az Európai Unió csatlakozásunkat követően, „A gabonaágazat helyzete a XXI. század elején” című szakmai program, Előadás, Budapesti Agrárkamara, 1073 Budapest, Dob utca 90., 2005. december 7.
4. **Kató N.** (2005): A közraktári hitelezés alapjai, „A gabonaágazat helyzete a XXI. század elején” című szakmai program, Előadás, Budapesti Agrárkamara, 1073 Budapest, Dob utca 90., 2005. december 7.

5. **Kató N.** (2005): A közraktározás alapjai, „A gabonaágazat jelene és jövője” című szakmai program, Előadás, Budapesti Agrárkamara, 1073 Budapest, Dob utca 90., 2005. november 9.
6. **Kató N.** (2005): A felvásárlási és élelmiszerárak, valamint az agrárrolló alakulása EU-csatlakozásunkat követően, „A gabonaágazat jelene és jövője” című szakmai program, Előadás, Budapesti Agrárkamara, 1073 Budapest, Dob utca 90., 2005. november 9.
7. Jancsok Zs. – **Kató N.** (2005): Vészesen fogy az idő, Budapest, 2005, *Napi Gazdaság* XV. évfolyam 66. (3894.) szám, ISSN 1217-5501, 15. pp.
8. Jancsok Zs. – **Kató N.** (2001): Van helye a raktárakban a gabonának Magyarországon- Rekordot döntöttek a közraktárak, Budapest, 2001., *Napi Gazdaság* XI. évfolyam 246 (3034.) szám, ISSN 1217-5501, 22. pp.
9. Jancsok Zs. – **Kató N.** (2001): Felfutóban a „raktárjegyes” kölcsönök Magyarországon- A bankok mellett idén már mind a három közraktár is hitelez, Budapest, 2001., *Napi Gazdaság* XI. évfolyam 174 (2962.) szám, ISSN 1217-5501, 6. pp.
10. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2003.):
A magyar gazdaság 2002-ben:
Kató N. (2003): Csökkent a mezőgazdaság hozzáadott értéke 56-62 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.hu/dokk/binary/35/45/17/MG2002Q4.pdf>
11. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2003.):
A magyar gazdaság 2003/1:
Kató N. (2003): Csökkent a mezőgazdaság hozzáadott értéke 51-55 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.hu/dokk/binary/35/45/15/MG2003Q1.pdf>
12. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2003.):
A magyar gazdaság 2003/2:
Kató N. (2003): Mezőgazdaság 31-33 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.hu/dokk/binary/35/45/04/MG2003Q2.pdf>
13. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2003.):
A magyar gazdaság 2003/3:
Kató N. (2003): Mezőgazdaság 31-34 pp.
Gazdasági és Közlekedési Minisztérium honlapja:

14. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2004.):
A magyar gazdaság 2003-ban:
Kató N. (2004): Mezőgazdaság 30-32 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.hu/dokk/binary/35/33/57/MG2003Q4.pdf>

15. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2004.):
A magyar gazdaság 2004/1:
Kató N. (2004): Mezőgazdaság 30-33 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
http://www.gkm.hu/dokk/binary/36/99/16/MG2004q1_final.pdf

16. Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2004.):
A magyar gazdaság 2004/2:
Kató N. (2004): Mezőgazdaság 31-34 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.hu/dokk/binary/44/31/23/mg2004q2.pdf>

17. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2004.):
A magyar gazdaság 2004/3:
Kató N. (2004): Mezőgazdaság 31-33 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
http://www.gkm.hu/dokk/binary/46/22/89/MG_2004Q3.pdf

18. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2005.):
A magyar gazdaság 2004-ben:
Kató N. (2005): Mezőgazdaság 31-33 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
http://www.gkm.gov.hu/data/58898/MG_2004_q4.pdf

19. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2005.):
A magyar gazdaság 2005/1:
Kató N. (2005): Mezőgazdaság 17-18 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.gov.hu/data/81195/2005Q1.pdf>

20. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2005.):
A magyar gazdaság 2005/2:
Kató N. (2005): Mezőgazdaság 17-19 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.gov.hu/data/81195/2005Q1.pdf>
21. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2005.):
A magyar gazdaság 2005/3:
Kató N. (2005): Mezőgazdaság 18-20 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.gov.hu/data/81195/2005Q1.pdf>
22. **Kató N.** (2005): A felvásárlási és élelmiszerárak, valamint az agrárrolló 2005. évi alakulásának elemzése
Gazdasági és Közlekedési Minisztérium honlapja:
http://www.gkm.gov.hu/data/388714/Mg_arak_2005.pdf
23. **Kató N.** (2005): A magyar élelmiszergazdaság külkereskedelmi teljesítményének alakulása, illetve az abban bekövetkezett fő változások EU-csatlakozásunkat követően
Gazdasági és Közlekedési Minisztérium honlapja:
http://www.gkm.gov.hu/data/361319/Mg_kulker_EU_utan__2_.pdf
24. **Kató N.** (2005): A mezőgazdasági felvásárlási árak, az élelmiszerárak és az agrárrolló alakulása 2004-ben
Gazdasági és Közlekedési Minisztérium honlapja:
http://www.gkm.gov.hu/data/111094/Ellelmiszerar_valtozas_netre.pdf
25. A Gazdasági és Közlekedési Minisztérium Közgazdasági Főosztálya (2006.):
A magyar gazdaság 2006/1:
Kató N. (2006): Mezőgazdaság 18-19 pp.
Gazdasági és Közlekedési Minisztérium honlapja:
<http://www.gkm.gov.hu/data/81195/2005Q1.pdf>

REFERENCES

1. Rieger L. – Szőke Gy. (2006): A 2004-2005. évi gabonaintervenció jellemzői Magyarországon, *Európai Tükör*, XI. évfolyam 2. szám, 2006. február, ISSN 1416-6151, 64-78. pp.

2. Cseke Z. - Nógrádi J. (2006): Az intervenciós raktározásban rejlő piaci lehetőségek az agrárgazat számára
XLVIII. Georgikon Napok, 48th Georgikon Scientific Conference, „Agrárgazdaság, vidék, régiók multifunkcionális feladatok és lehetőségek”, Az EU közös piaca, marketing szekció, Keszthely, 2006. szeptember 21-22., ISBN 963 9639 11 7, 6 p.
3. Rieger L.- Szőke Gy (2007): Implications of the Two Super Large Hungarian Cereal Interventions (2004/05 and 2005/06), Agricultural Economics and Transition" Joint IAAE-EAAE, konferencia kiadvány