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DETERMINE THE KEY FACTORS OF THE AGRARIAN ECONOMIC GROWTH IN THE 21TH CENTURY IN HUNGARY

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Key words: economic growth, agriculture, influence, subsidy, EU.

CONCLUSIONS

Economic growth is the top economic and political priority of world leaders. Countries with significant rate of development are higher ranked and serve as models for the developing countries and for the economies in transition.

As an EU member, Hungary needs to close up the gap also in case of the agriculture. After analysing the period 1994-2004 the major factor among supports influencing growth is investment subsidies ahead of current flow supports such as Supports to reduce the cost of agricultural production.

Irrespective of the alternating periods, the gradients established in the statistical analyses and the results from the study of elasticity along the period justify one of the basic tenets of modern economics: in order to achieve the bigger growth, the funds in the form of investments have multiple effects compared to current flow subsidies. In other words, support for the agricultural sector is more effective in the form of investments.

Growth formulas for the agricultural sector might be possible with several different approaches and methods; the ones presented in this study are sketches of some of the alternatives. The aim of the research was to identify tendencies and factors that characterise and justify changes in the sector. In the future, agricultural models could arrive at conclusions with well-founded practical implications, which could set agriculture on a path of growth once again. The analysis of the data in the coming years, including the next study of the impact of EU membership, could trace the importance and impact of the factors.

Reflecting on the way to the future, investments will continue to have a decisive effect on growth in agriculture. Agricultural output cannot be kept up successfully with the present infrastructure. In order to catch up with the average of the sector in the EU, growth in the GDP through improving efficiency and productivity would be essential, as the present stagnation is due to the low levels in these factors. In order to achieve this aim of increasing the effectiveness, several improvements are necessary: better technology, more favourable basis of production, advances in agrotechnology, hygiene and crop protection, as well as the concentration of land. These aspects should be the priorities for investments and projects. Furthermore, better infrastructure, transportation capacities, maintenance, information and data exchange are necessary for increased efficiency. This direction can be seen in case of 2005 and 2006 and suppose to be continued. As a member of the EU, Hungary faces a fiercer competition in the market, and further being left behind in the field of agriculture has a negative effect on the economy overall.

ABSTRACT

Economic growth is the top economic and political priority of world leaders. Countries with significant rate of development are higher ranked and serve as models for the developing countries. Researching the Economic Growth is one of the oldest disciplines within economics, so it is surprising that the number of growth models focusing on the individual sectors such as the agriculture is relatively low, although the complexity of economic processes would call for the analysis of the sub-areas of the economy as well. Agriculture has always played a significant role in the economic growth of Hungary. Despite the recent decline, the importance of the sector cannot be overlooked or downplayed. The aim of my research is to observe the economic growth of agriculture in Hungary in the 21th century. Analysing the period 1994-2004 and 2000-2005 separately for identifying the major factors influencing growth, calculating their relative weight in the changes and characterising in depth their role. A statistical programme named SPSS was used for the analyses.

INTRODUCTION

The 20th century witnessed spectacular and significant changes in world economy. The structural and employment makeup of former times transformed rapidly, and agriculture lost its leading role. Structural change was the result of the differences in the pace of development across the sectors of economy. Research in growth theory became focused on the differing patterns of development, changes across countries and its reasons, seeking for answers to the emerging problems of the modern era, and outlining possible paths of development for the future. Researching growth models is one of the oldest disciplines within economics, so there is abundant background literature on the topics of analysing the factors of development and growth models. In the light of this, it is surprising that the number of growth models focusing on the individual sectors themselves is relatively low both in the home and international literature, although the complexity of economic processes would call for it. Owing to the natural circumstances, agriculture has always played a significant role in the economic growth of Hungary. Despite the recent decline, the importance of the sector cannot be overlooked or downplayed. Moreover, in connection with the EU access and membership, this sector is in the spotlight again although the relatively low added GDP of the whole economy.

MATERIAL AND METHODS

Economic growth is an extremely complex phenomenon; it poses considerable difficulties for the analyses. The literature identifies four main problems about generating calculations

(1) selecting the period of reference;
(2) defining factors;
(3) creating the relevant database;
(4) adjusting the set of preconditions.

(1) When choosing the suitable timeframe for developing an analysis, it had to be considered that the circumstances affecting agriculture in Hungary were quite different each year. Furthermore, the categories used in the relevant Hungarian and EU statistics in some case were not identical clearly. It is important to note that 2004. was a different year due to the EU accession. Happened to be once affected actions do not calculate later plus many expected aids arrived only in the following year. This present paper observed a longer period 1994-2004 but concentrates more on the period before and after EU membership: *2000-2005*.

(2) As for the problem of selecting and defining the factors to be taken into consideration, the main issue is that economic growth is influenced simultaneously by a very large number of factors; therefore, integrating all of them within the scope of a single study is virtually hopeless. Due to my previous researches in this topic, the given paper only concentrates on the affect of the capital: the *investments* and the *different supports* of the sector.

(3) For compiling the *database*, only the relevant figures in the agricultural sector were taken into consideration. Using data from the *Agricultural Statistical Yearbooks* and the databases of the *Central Statistical Office* (KSH) and the *Tax and Revenues Office* (APEH). Thus, the data are from reliable and uniform sources, and use the same frame of reference throughout.

(4) Statistical programme SPSS was used in order to analyse the relationships between the factors and for quantifying their role. In the first step, *correlations* were calculated to survey the network of relationships between the factors. Subsequently, several methods of *regression* were used to map the exact shape and strength of the relationships.

DISCUSSION

As for the changes in GDP are compared in the EU-15 and in Hungary it is clear that the national economy as a whole catching up (the total GDP growth is much higher than in the EU average) but agriculture lagging behind is confirmed. Only in some individual years could overpass the figure due to excellent weather, but overall the total number is below it.

So *the main question is how to improve the GDP growth in the agricultural sector to close up the gap to the EU*. Moreover, other bad affect can be seen in connection with it. Hungary has managed to keep up a positive trade balance in agriculture (it is on the increase slightly calculated in euros), but it is decreasingly capable of compensating for the increasing negative trade balance of the economy as a whole. And the lack of GDP is growing.

RESULTS

The starting point to set up the components of GDP was to justify the factors of it. Based on my previous researches in this given paper, the observed variables were:

- Current flow supports to enterprises such as
  - Supports to reduce the cost of agricultural production;
  - Market access supports.
- Target supports of investment.
- Investments.

For the factor analysis, the numerical values were compared across the years and the changes taken into consideration.

The following table shows the figures in the observed period. Analyses also were made for a longer period to compare the affect of the changes within the support structure.

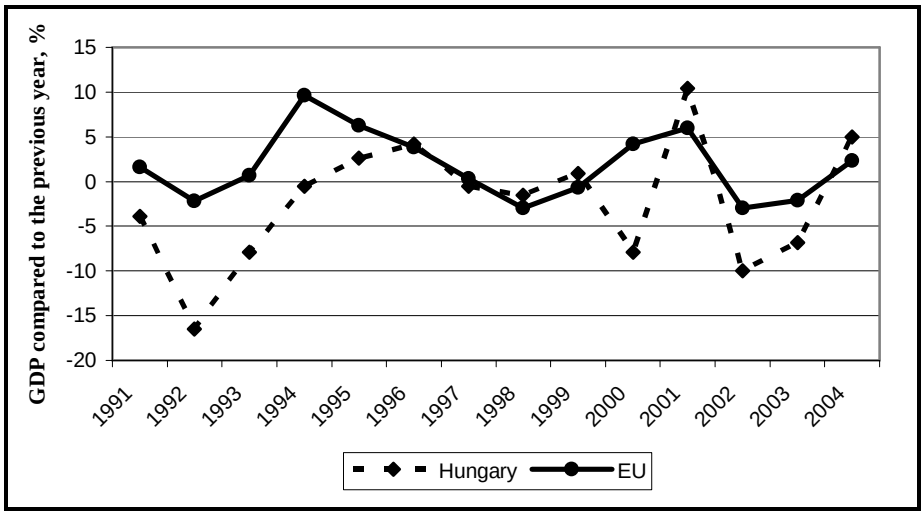
In 2004 much more support of investment and investment was distributed but it is important to note that more than a half of it was used for buying new trucks. However, in the future these great output parameters of the machines will not be used economically and effectively due to the small average size of the farms.

Correlation analysis

Due to correlation analysis, the relationship between the dependent factor (GDP) and the independent factors (supports and investments) can be seen (Table 2).

Figure 1

GDP of the agricultural sector in Hungary and in the EU



Source: own calculations based on National database (KSH)

Table 1

Supports and investments in the 21th century in Hungary (million HUF)

	2000	2001	2002	2003	2004
Supports to reduce the cost of agricultural prod.	47,285	86,589	67,645	66,658	60,927
Market access supports	49,549	32,566	44,626	51,862	29,731
Current supports to enterprises	96,834	119,155	112,271	118,521	90,659
Target supports of investment + investments	76,759	92,473	95,888	110,175	202,389
GDP	488,500	562,000	553,100	548,781	666,100

Source: Tax and Revenues Office (APEH)

Table 2

Correlations

Between	Period	Correlation*	Significance**
GDP and Supports to reduce the cost of agricultural production	1994-2004	**0.8340702**	0.001
	2000-2004	0.2270029	0.467
GDP and Market access supports	1994-2004	-0.4323104	0.132
	2000-2004	-0.7722371	0.031
GDP and Current flow supports to enterprises	1994-2004	**0.7269704**	0.011
	2000-2004	-0.3463544	0.550
GDP and Target supports of investment plus investments	1994-2004	**0.9112561**	0.000
	2000-2004	**0.9457889**	0.000

**Pearson correlation ** 2-tailed,*

Source: own calculation, using SPSS

The correlation analysis (with the help of SPSS) revealed that there are significant differences between the two observed periods. The independent variables show strong and clear relationship with the dependent variable. Observing them separately in case of *Supports to reduce the cost of agricultural production* and *Current flow supports to enterprises* the coefficient for GDP was strong (with very good 2-tailed significance, below 1 percent) in the whole period meanwhile in the 21th century there was not. In case of *Market access supports* it happened inverse. So it is evident that the reason of it is the changes within the structure of the *Current flow supports to enterprises.* As for the supports in the agricultural sector, the amount of them (in comparison price) was decreased in the 90's. Within the export supports reduced drastically due to other protection assets stepped in such as guaranteed prices, intervention, production stabilization and quotas. Meanwhile these current supports varied over the years relatively in the same amount in flow price while the investment supports increased. About *Supports of investment* and *investment* the coefficient for GDP was very strong in both observations (R^2 over 0.9 with 0.1 percent of significance). It reflects on a significant fact: with investment supports GDP growth can influence more than in other type of supports. *It means that to increase the GDP on the sector, to close up the gap to the EU and to advance for the export balance of the country, investment supports need to favour ahead of current supports.*

About the difference of the two observed period an important change can be seen. Ahead of the EU accession the structure of supports were drifted towards to support of investment which caused higher correlation in case of 2000-2004. Still in a longer period Current flow supports and Supports to reduce the cost of agricultural production correlates with GDP but mainly in the first part of the observed period. The importance of investment stepped ahead as the EU membership was approaching and actually more support arrived in the sector in this form.

Regression analysis

In order to observe the influence of each factor, regression analysis can help to measure their effects for the period of 1994-2004. Using stepwise method[1] of the statistical programme to create formula of the best regression function. The linear regression analyses show that *the strongest single factor is Supports of investment and investments, accounting for 83% in the change of GDP* as a single variable with significant of 0.000 and excellent t-value (6.638). The other variables show lesser coefficient for GDP with worse significance and t-value. *Market access supports* does not have a direct independent impact on changes in GDP. It is important to note, however, that the lack of relationship point out to a significant fact: as for supporting the export with flow payments, it does not have direct effect on the GDP growth! That's why the amount of it decreased slightly. Analysing the possible versions (linear and different non-linear types), the best linear regression functions showed that economic growth in the given period in Hungary can be summarised in the following formulas (Table 3).

Out of different types of observation the best fitting functions include only one

[1] In case of this method each of the independent factors are selected and observed separately and individually; if there is regression with the dependent factor, it remains within the observation, if there is not, it is removed.

factor and a constant value with better significance and t-value than in case of a complex formula or in non-linear regression. Overall, the best-fitting function covers 83% of all change. All this indicates that the remaining variation is due to other factors, most probably indefinable or unquantifiable ones. An important conclusion from this calculation is that the most increase in GDP can be achieved through input in the form of supports of investments plus investments. *Miscellaneous factors* and effects include regulations and other related variables, such as the budget, taxes, foreign trade, the finance sector, the monetary, investment, integration and regional politics, and the degree and direction of state intervention. Furthermore, factors affecting the global economy also belong here, such as recession, natural disasters, and technological improvements. Moreover, in case of agriculture, do not forget the *effect of the weather*. Figure 2 shows the best fitting regression formula and the observed line between GDP and supports of investments and investments.

Table 3

Additional statistical data for linear functions

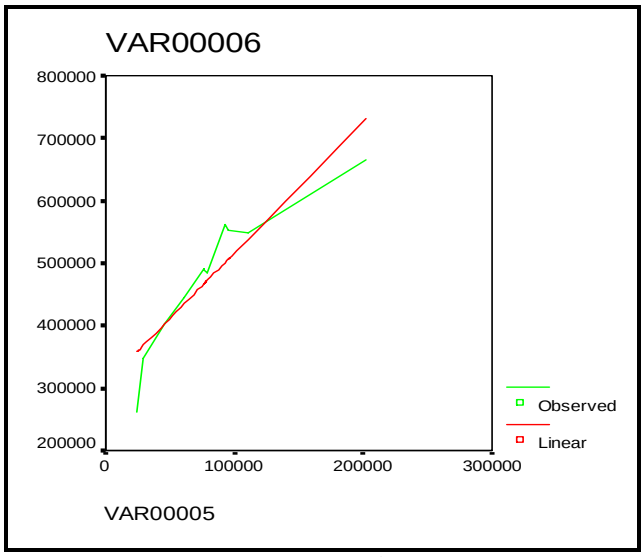
	R^2	Sign.	Functions with two variables
Supports to reduce the cost of agricultural prod. (Sc)	0.696	0.001	GDP = 331308 + 3,52 Sc
Market access supports (Sm)	0.187	0.184	GDP = 735087 – 5,88 Sm
Current flow supports to enterprises (Sf)	0.528	0.046	GDP = 205523 + 3,186 Sf
Target supports of investment plus investments (Si)	**0.830**	**0.000**	**GDP = 306755 + 2,095 Sc**

Source: own calculation, using SPSS

2005 was the first total year as an EU member. Using the previous results, it is interesting to observe the way of the support how they were actually oriented. Table 4 shows the amount of agricultural supports (plan and fact) in 2004-2005 in different distribution structure. 2004 was a relatively different year in case of the EU support not just the effect of the seven months membership.

The real reason of the „missing money" was that many agrarian payments (national support) actually happened in 2005. That's why in the following year much more national support was used as the plan. About the direction of the supports, in 2005 more direct payments had happened which means that the achieved GDP growth could have been more. As an EU member, more agricultural supports are needed to be distributed towards to the investment. Generally with current flow supports only the cost of the production could reduce (or in many cases the loss are compensated) and the effect can feel only in one year. To close up to the EU longer effects are needed so without sufficient investments the sector live up its reserves and step into a non-returnable path. As for the future, the budget plan in *2006* shows this direction. Much more Rural Development payments are progrested such as modernisation, environment protection, AVOP and SAPARD.

Figure 2



*Var 06 – GDP growth, Var 02 – Support of investment plus investment
Source: own calculation, using SPSS

Table 4

Agricultural supports (billion HUF)

	2004	**2005 (Plan)**	**2005 (Fact)**	**2006 (Plan)**
National support	131.0	50.9	157	56.0
Top-up (additional national support add to EU support)	51.7	89.2	154	200.0
SAPS (direct)	10.0	89.3		
SAPARD	14.9	33.6	45	113.0
AVOP				
National Rural Development Plan		44.1	39	
Market supports		20.6	39	3103
Total	207.6	327.7	434	400.3
Plan (2004)	290.3			
Intervention stock			146	

Source: AKI, 2005

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