

**University doctoral (PhD) dissertation abstract**

**THE ECONOMIC AND SOCIAL ANALYSIS  
OF TOBACCO SECTOR**

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## **1. THE OBJECTIVES OF THE RESEARCH**

Due to the effects of the economic and political change of system, the privatisation, the accession to the EU, Hungarian agriculture has gone through significant changes in the last two decades. Before we joined the European Union several studies had dealt with the prospect of the Hungarian agriculture and within this the prospect of tobacco cultivation. Before the accession to EU tobacco producers had prepared for the introduction of the income subsidy and quota system used in the EU, which meant that the subsidy was determined by the variety groups and they supported the creation of production groups, as well. After the accession though the new member states did not enjoy equal rights with the old member states. The subsidy system which basically determined the income of tobacco growing was changed in 2004 during the reform changes made in the Common Agrarian Policy (CAP). These were made necessary by internal and external causes; tobacco regulation was not in accordance with the reformed agrarian policy and with the sustainability aims of Gothenburg. The aim of the introduction of the reform was to decouple tobacco premiums from production though at the same time the Committee made it possible that within the member states some of the subsidy could be related to production. The new top-up system was introduced in 2007. This subsidy system was introduced in the 15 EU member states in 2006 the effect of which was that a huge proportion of farmers gave up tobacco growing: there was a 70-80% decrease in Greece and Belgium and 45% in Portugal.

Because of the continuous changes of the economic and regulatory environment the employees of the sector have to plan and maintain cultivation and adapt to the changing market needs within continuously changing circumstances. Consequently, they have to face several new challenges and besides the problems which are present in other sectors, too – like market price competition, continuous change of subsidy systems, strong WTO pressure – their position is made even more difficult by the constantly strengthening global anti-smoking campaign.

Due to the changes the area of tobacco cultivation and in parallel the harvested crop have been decreasing steadily for the last two decades in Hungary. This causes significant problems in the processing sector since the decline of capacity usage through the increase of the average fix costs leads to the increase of specific costs. The further decline in production would lead to the ruin of processors and possible closures. This would endanger the existence of the sector and would cause several undesired economic and social effects on the one hand

the employee of the tobacco sector and on the other hand among the regions and small areas affected by the sector.

The short summary of the current situation as written above is the support to the actuality of my thesis and justifies my targets that is to prove the economic and social necessity of maintaining tobacco cultivation. To accomplish these targets I composed general and specific objectives and established three hypotheses the pertinence of which I wish to prove during my research.

The **general objective** of my research is none other but is to prove the economic and social necessity of maintaining tobacco cultivation.

The related sub-objectives can be defined as:

1. The determination of the result and effectiveness of tobacco cultivation with the subsidy levels that adapt to the change of subsidy system using a complex economic analysis.
2. The determination of the economic status of the national producers who have left tobacco production since the EU accession.
3. The determination of the role of the tobacco sector in the budget and rural development with special attention to its role in employment.

My **special objectives** which are related to the general objectives serve the purpose to give scientifically based answers to my questions. The questions that have come up in connection with my research topic are the following:

1. How do the expenditure, cost, income and result of the cultivation change in different subsidy systems?
2. What is characteristic to the efficiency of the production before and after the change of the regulatory system?
3. Whether those producers who had left tobacco production were able to continue their agricultural activities or they had to look for other source of income?
4. What is the opinion of those producers who have turned from tobacco production to other field of agriculture about other forms of agriculture?
5. How did the producers' standard of living changed after they had finished tobacco production?
6. What kind of consequences can be drawn from the examination of the status of past tobacco producers to those producers who are still in tobacco production?

7. What is characteristic to the budget relations and employment status of the persons of the tobacco sector?
8. How do the loss of income source of the state budget and the emerging extra expenses in case the sector ceases to exist.

In accordance with the general objectives I established the following three **hypotheses**:

1. The planned subsidy system of tobacco cultivation endangers the maintenance of tobacco cultivation thus the persons of the sector could give up their activities.
2. In the last 5-10 years those producers who gave up tobacco production did not manage to stay in the agricultural sector; those producers who continued their activities in a different sector live and produce in worse conditions.
3. To maintain the current subsidy level of tobacco production means a lesser burden to the state than the termination of the production since the lost incomes and the emerging extra costs would supersede the current level of subsidy.

## **2. PRELIMINARIES AND THE UTILIZED METHODS**

The backgrounds of the research and the applied methods are presented according to the articulation of the main objectives. I would like to point out here that my research did not cover the trade of tobacco products and the incomes and expenses connected to it. The reason is that it evolves on a global level which is independent of the local tobacco production thus the retail and wholesale trade of tobacco products would probably remain the same.

### **2.1. The determination of the result and efficiency of tobacco cultivation in line with the subsidy levels adjusting to the change of subsidy systems using a complex economic calculation**

To answer the questions raised in the objectives I used primary and secondary research. First, I found it necessary to make economic research of tobacco cultivation as the basis of the sector. The cost-income situation of tobacco cultivation – float bed transplants separately for Virginia tobacco and for Burnley tobacco – was analysed by the business management modelling based on production survey imagining a 4-hectare tobacco production farm at different subsidy levels. The model I made was designed for a 4-hectare production size because currently in Hungary the average size of tobacco production is 4 hectares and on top of that the exploitation of the curing chamber in the case of Virginia tobacco is optimal at that production size. The determination of the results of the model farm was made on the basis of an operative plan which I made with the help of planning papers created at the Economy School of the University of Debrecen CAAES. To collect the necessary input data for the making of the model I designed a questionnaire which collects the data of tobacco production following the technological steps, precisely defining the necessary live- and mechanical labor, the used own and purchased materials, the amounts and the input prices. I acquired all data within a personal consultation. Besides these I relied on the data of the National Association of Hungarian Tobacco Producers (MADOSZ). The average purchase prices were provided by a tobacco fermenting firm that has a leading role in the Hungarian market. To get a more precise understanding of the data I used the the financial and book-keeping records of the particular firms. Based on the collected data I planned the production-technology to be applied and the most important technical parameters that can be reached by this which define the necessary inputs and the yields that can be reached. After the estimation of the sales prices and the yields we can calculate the expected income in the sector and then by taking into account other incomes (subsidy) the production value. The production-technology determines

the material, labour and mechanical needs of the sector. After their natural planning with the use of the current prices I determined the necessary costs. For the model I have taken into account the costs of the invested materials (curing chamber, irrigation system) connected to tobacco cultivation. Having examined the different types of costs I determined the production costs and from certain categories of production value and costs the main income categories, as well. I have made the plan dynamical with references with the help of Microsoft Excel which enabled it to make a sensitivity examination of the model. The aim of sensitivity examinations is to determine in what extent the inaccuracies of the planning and the emerging changes influence the results of the investment-economical calculations. With its result we can determine the „ceteris paribus” result change as the effect of the 1% change of the given variable. By simulating scenarios connected to different economic situations the model can be run again and again. In my thesis I examined the changes of the following factors:

- output price change;
- input price change in two cases (wage and material cost)
- yield level change

To analyse the result of the model farm I used cost-benefit analysis which includes the examination of the composition and standard of natural inputs and production costs as well as a detailed analysis of the result and effectiveness of the production. Finally, calculating with the results I got I examined if the 4-hectare model farm can support an average four-member family. To determine this I correlated the received results with the Hungarian Central Statistical Office's data of breadline values and the real annual consumption expenses of a single person in the household.

## **2.2. The assessment of the situation of those who left tobacco production**

For the justification of my second hypothesis I have made a so-called „follow-up examination” among those tobacco producers who have given up tobacco production in recent years and have left the sector. This examination was also based on primary data acquisition. I have made a standardised questionnaire for the research. By decoding the data I received from the questionnaire I have formed and processed a database with the help of Microsoft SPSS 15.0 for Windows programme. The unit number of the sample was 122, so that was the number of past tobacco producers who were questioned. The sample was chosen by a simple random sample taking and can be considered representative because the survey involved more than 20% of the target group. The questionnaires were filled in personally with the help of the agronomists of the Nyírség Tobacco production Group in the area of Hajdú-Bihar and

Szabolcs-Szatmár-Bereg counties. I used both open and closed question types in the questionnaire. The variables present in the questionnaire were mostly ordinal and nominal measure levels and there was also a three-scale type of variable. Since in the result of my questionnaire survey certain questions did not show normality I uniformly decided to use non-parameter methods when comparing the averages of two or more samples. I used Kruskal-Wallis analysis for this. Then I made Kaplan-Meier survival analysis. By applying this method I tried to show how big the risk is in the case of a producer that after certain time spent in production he would give up tobacco production and agricultural activity. By using the results of the survival curves I also applied the Cox-like parameter analysis in order to explain with different issues the risk of giving up production. The proof of certain results of the questionnaire were supported by economic calculations, as well.

### **2.3. The determination of the role of tobacco sector in budget and rural development**

To justify my third hypothesis I also used primary and secondary research, too. As a part of this I designed a data collection form for all organisations that participate in the tobacco sector from the production of the biological base to the secondary processing. My aim was to collect all basic data which have direct effects on employment and livelihood. I used the 2009 reports of the companies concerned as a data source and I analysed those lines which are connected to the budget payments. I examined those revenues which directly affect the budget and for this I used the following items:

- corporation tax
- local business tax
- Value added tax (VAT)
- Employer's contributions
- Employee's contributions

With the help of this we can show the payments to the state of the companies present in the sector (in the forms of different taxes and contributions). By summarising the data we can measure the maintenance and budget balance of the tobacco sector.

### 3. THE MAJOR FINDINGS OF THE THESIS

The main findings of the examinations within the dissertation are presented according to the targets

#### **3.1 The determination of the result and effectiveness of tobacco cultivation with the subsidy levels that adapt to the change of subsidy system using a complex economic analysis.**

On the basis of the results of the 4-hectare model farm I determined the structure of the cultivation costs of tobacco production (Virginia and Burley). Considering plough-land cultures tobacco constitutes a special sector from different perspectives. It is justified by the standard and composition of production costs. Its specific production cost exceeds 1 million HUF. We have found differences between the production costs of the two different tobacco types which is caused by the different cultivation technology specifically caused by the differences in tobacco curing. The Virginia type tobacco (flue cured) is cured artificially in curing chambers while Burley is cured in a natural way (light air cured) in tobacco barns after manual sewing. In the case of other sectors of plant cultivation the majority of costs – in some cases even 80% - are material costs. In the case of tobacco cultivation it makes up about 30% of the total cost, in the model farm with Virginia type tobacco it makes up about 35%, while in the case of Burley tobacco it is about 20%. The composition of material costs in Virginia tobacco cultivation is shown by Figure 1.

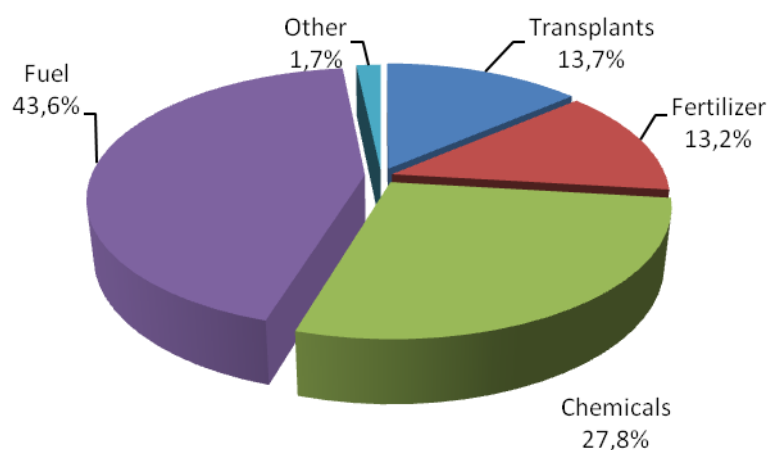


Figure 1. **The distribution of material costs of Virginia tobacco**

Source: own calculation and illustration



A considerable part of the production cost is made up by the personal costs because the labor-need of tobacco is exceptionally high. Its value per hectare exceeds 1000 man-hours. The basis of the social role of tobacco cultivation is that it needs primarily unskilled work so it offers a living for the local unskilled labor force. The rate of personal costs in the model farm in the two tobacco types varied between 37-55%.

We can find considerable differences between the yields of tobacco production. In the model farm with the proposed cultivation technology a 1.8-2.0 t/ha yield can be achieved but nowadays the national result falls behind significantly. On the one hand it is caused by the regulatory system of the EU and on the other by the relatively low purchase prices which in their present form do not urge the producers to raise production and neither to harvest all of the cultivated tobacco.

In the examination I analysed in details the structure of the gross production value of the model farm as well as the composition of income and other incomes which have no yield content (in this model only the used subsidy). In the case of tobacco, as I have already articulated, three-quarters of the production value comes from subsidy because of the peculiarity of the regulatory and subsidy system. Since our EU accession the regulatory system and with it the level of subsidy have changed considerably. This has a fundamental effect on the results of tobacco production. Since the preparation for the accession there were three different versions of the regulatory system of tobacco production. During my research I calculated the results of the model farm with all three subsidy levels and then I evaluated and compared the received results.

The **first**, initial level of subsidy was calculated by taking into account the SAPS + TOP UP subsidy system which was valid at the time of the accession. With this version the producer would have been entitled for 100% of the EU subsidy sum in 2010. Another reason of the outstanding result is that the purchase price is much higher than the original which is due to the decreasing subsidy caused by the change of regulatory environment. It is probable that with the original subsidy intensity the purchase price would have been defined at a lower amount in 2010. In accordance with the changing of subsidy system – the **second version** of my calculation – I calculated the achievable values with the SPS system which was determined during the 2004 changes of CAP reforms. The subsidy ratio coupled to production is the maximum 60% and the ratio decoupled from production is 40%. This means that 60% of the above written original subsidy intensity would only be received if the producers

continue their tobacco production activity to be entitled to use the subsidy and if they meet the requirements. In this case the production value decreases in such level that it just covers the production costs (1261 thousand HUF per hectare). If the producer decides to stop production he is entitled to the subsidy decoupled from production thus he could reach a much higher result. In the **third version** I made my calculation with the currently used subsidy levels. In that subsidy intensity I show the current SAPS + TOP UP system with the use of restructuring subsidy. (Table 1. and Table 2.)

*Table 1: The results of Virginia production*

<b>The results of Virginia production by the original SAPS + TOP UP subsidy system</b>				
<b>Denomination</b>	<b>Unit</b>	<b>Sector total</b>	<b>Value per hectare</b>	<b>Rate (%)</b>
TOTAL YIELD	t	7,3	1,825	
saled yield	t	7,3	1,825	
unit price	k HUF/t	280	-	
REVENUES	k HUF	2044,0	511,0	24,1
Other revenues	k HUF	6436,8	1609,2	75,9
SAPS + TOP UP	k HUF	6436,8	1609,2	
<b>PRODUCTION VALUE</b>	<b>k HUF</b>	<b>8480,8</b>	<b>2120,2</b>	<b>100,0</b>
<b>Results with the SPS system with coulpe options</b>				
TOTAL YIELD	t	7,3	1,825	
saled yield	t	7,3	1,825	
unit price	k HUF/t	280	-	
REVENUES	k HUF	2044,0	511,0	38,9
Other revenues		3 218,40	804,6	61,1
SAPS	k HUF	132,8	33,2	2,5
SPS coupled	k HUF	1851,2	462,8	35,2
SPS decoupled	k HUF	1234,4	308,6	23,4
<b>PRODUCTION VALUE</b>	<b>k HUF</b>	<b>5 262,40</b>	<b>1 315,60</b>	<b>100</b>
<b>Results with the current SAPS + TOP UP system with the use of restructuring subsidy</b>				
TOTAL YIELD	t	7,3	1,825	
saled yield	t	7,3	1,825	
unit price	k HUF/t	280	-	
REVENUES	k HUF	2044,0	511,0	24
Other revenues		<b>6 480,00</b>	<b>1 620,00</b>	<b>76</b>
SAPS+TOP UP	k HUF	2 268,00	567	26,6
Restructurong subsidy	k HUF	4 212,00	1 053,00	49,4
<b>PRODUCTION VALUE</b>	<b>k HUF</b>	<b>8 524,00</b>	<b>2 131,00</b>	<b>100</b>

Source: own calculation

In the case of Burley both the subsidy intensity and the purchase price are about 20% lower than with Virginia tobacco. It is caused by the lower quality of the tobacco. The results here show a similar picture to that of Virginia.

*Table 2: The results of Virginia production*

<b>The results of Burley production by the original SAPS + TOP UP subsidy system</b>				
<b>Denomination</b>	<b>Unit</b>	<b>Sector total</b>	<b>Value per hectare</b>	<b>Rate (%)</b>
TOTAL YIELD	t	7,3	1,825	
saled yield	t	7,3	1,825	
unit price	k HUF/t	280	-	
REVENUES	k HUF	2044,0	511,0	24,1
Other revenues	k HUF	6436,8	1609,2	75,9
SAPS + TOP UP	k HUF	6436,8	1609,2	
<b>PRODUCTION VALUE</b>	<b>k HUF</b>	<b>8480,8</b>	<b>2120,2</b>	<b>100,0</b>
<b>Results with the SPS system with coulpe options</b>				
TOTAL YIELD	t	7,3	1,825	
saled yield	t	7,3	1,825	
unit price	k HUF/t	280	-	
REVENUES	k HUF	2044,0	511,0	38,9
Other revenues	k HUF	3 218,40	804,6	61,1
SAPS	k HUF	132,8	33,2	2,5
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<b>PRODUCTION VALUE</b>	<b>k HUF</b>	<b>5 262,40</b>	<b>1 315,60</b>	<b>100</b>
<b>Results with the current SAPS + TOP UP system with the use of restructuring subsidy</b>				
TOTAL YIELD	t	7,3	1,825	
saled yield	t	7,3	1,825	
unit price	k HUF/t	280	-	
REVENUES	k HUF	2044,0	511,0	24
Other revenues	k HUF	<b>6 480,00</b>	<b>1 620,00</b>	<b>76</b>
SAPS+TOP UP	k HUF	2 268,00	567	26,6
Restructurong subsidy	k HUF	4 212,00	1 053,00	49,4
<b>PRODUCTION VALUE</b>	<b>k HUF</b>	<b>8 524,00</b>	<b>2 131,00</b>	<b>100</b>

Source: own calculation

During my calculations according to the economic levels I calculated several result categories. Besides the result finally I calculated those indicators which can determine the efficiency of tobacco production the best (Table 3. and 4.)

Table 3: Main indicators of Virginia production (2009)

	original SAPS+TOP UP		SPS system		current SAPS+TOP UP + restructuring subsidy	
Denomination	Sector total	Value per hectare	Sector total	Value per hectare	Sector total	Value per hectare
Revenues	2 044 kHUF	511 kHUF/ha	2 044 kHUF	511 kHUF/ha	2 044 kHUF	511 kHUF/ha
Production value	8 481 kHUF	2 120 kHUF/ha	5 262 kHUF	1 316 kHUF/ha	8 524 kHUF	2 131 kHUF/ha
Production costs	5 040 kHUF	1 260 kHUF/ha	5 040 kHUF	1 260 kHUF/ha	5 608 kHUF	1 402 kHUF/ha
<b>Net income</b>	<b>3 440 kHUF</b>	<b>860 kHUF/ha</b>	<b>222 kHUF</b>	<b>55 kHUF/ha</b>	<b>2 916 kHUF</b>	<b>729 kHUF/ha</b>
Gross Value	4 655 kHUF	1 164 kHUF/ha	1 436 kHUF	359 kHUF/ha	4 158 kHUF	1 039 kHUF/ha
Standard Gross Margin	3 702 kHUF	925 kHUF/ha	483 kHUF	121 kHUF/ha	3 204 kHUF	801 kHUF/ha
Labour input (mech.)	348 hours	87 hours	348 hours	87 hours	348 hours	87 hours
Labour input (living)	3 020 hours	755 hours	3 020 hours	755 hours	4 000 hours	1 000 hours
Labour input (total)	3 368 hours	842 hours	3 368 hours	842 hours	4 348 hours	1 087 hours
<b>Indicators</b>						
Rate of income	168 %		10,9 %		142,7 %	
Return on total costs	68 %		4,4 %		51,9 %	
Cost level	59 %		95,8 %		65,8 %	
Income level	40 %		4,2 %		34,2 %	
Production value per working hours	2 517,8 HUF/h		1 562,3 HUF/h		1 960,4 HUF/h	
Revenues per working hours	606,8 HUF/h		606,8 HUF/h		470,1 HUF/h	
Net income per working hours	1 021,4 HUF/h		65,9 HUF/h		670,6 HUF/h	
Unit production costs	691 HUF/kg		691 HUF/kg		768,2 HUF/kg	

Source: own calculation

Table 4: Main indicators of Burley production (2009)

	original SAPS+TOP UP		SPS system		current SAPS+TOP UP + restructuring subsidy	
Denomination	Sector total	Value per hectare	Sector total	Value per hectare	Sector total	Value per hectare
Revenues	1 752 kHUF	438 kHUF/ha	1 752 kHUF	438 kHUF/ha	1 752 kHUF	438 kHUF/ha
Production value	6 893 kHUF	1 723 kHUF/ha	4 322 kHUF	1 081 kHUF/ha	6 936 kHUF	1 734 kHUF/ha
Production costs	4 988 kHUF	1 247 kHUF/ha	4 988 kHUF	1 247 kHUF/ha	4 988 kHUF	1 247 kHUF/ha
<b>Net income</b>	<b>1 904 kHUF</b>	<b>475 kHUF/ha</b>	<b>- 666 kHUF</b>	<b>- 166 kHUF/ha</b>	<b>1 947 kHUF</b>	<b>487 kHUF/ha</b>
Gross Value	3 117 kHUF	778 kHUF/ha	546 kHUF	137 kHUF/ha	3 160 kHUF	790 kHUF/ha
Standard Gross Margin	2 163 kHUF	541 kHUF/ha	- 407 kHUF	- 102 kHUF/ha	2 206 kHUF	552 kHUF/ha
Labour input (mech.)	348 hours	87 hours	348 hours	87 hours	348 hours	87 hours
Labour input (living)	4 173 hours	1 043 hours	4 173 hours	1 043 hours	4 173 hours	1 043 hours
Labour input (total)	4 521 hours	1 130 hours	4 521 hours	1 130 hours	4 521 hours	1 130 hours
<b>Indicators</b>						
Rate of income	108,7 %		- 38,1 %		111,2 %	
Return on total costs	38,1 %		- 13,4 %		38,9 %	
Cost level	72,4 %		115,5 %		72,0 %	
Income level	27,6 %		- 15,5 %		28,0 %	
Production value per working hours	1 524,6 HUF/h		956,1 HUF/h		1 534,2 HUF/h	
Revenues per working hours	387,5 HUF/h		387,5 HUF/h		387,5 HUF/h	
Net income per working hours	421,2 HUF/h		- 147,3 HUF/h		430,7 HUF/h	
Unit production costs	683,3 HUF/kg		683,3 HUF/kg		683,3 HUF/kg	

Source: own calculation

From the indicated result categories two worth mentioning. The first one is the gross value that is connected to the direct income production of the sector, the second one is the net income which we get after deducting the general costs.

Besides the displayed efficiency indicators several other efficiency indicators can be constituted from the data. I constituted several other sophistication and efficiency indicators related to the model farm, from which I would point out a few. The work need indicators show how much worktime is needed to reach a result. In tobacco production, already with the Virginia production this is an exceptionally high value, 755 hours per hectare and with Burley the manual work need is 1043 hours. On the basis of the detailed table in the appendix it can be assessed that for the production of 1 ton of product more than 410 hours is needed. The income for one working hour exceeds 1000 HUF.

From the cost-effective indicators the most important is the overhead which shows the cost needs which is close to 700 HUF per kilogramm with both types. This is considerably higher than the purchase price. We can say that without the subsidy to compensate the costs the current purchase prices should be raised by 250% which is three times more than the current world market prices. Another cost-effective indicator is the cost level. This shows what cost is needed for the production value of 100 HUF. This is 60 HUF in the case of Virginia and 70 HUF in the case of Burley in our model farm.

Finally I would point out two from the income categories cost ratio profitability and cost level respectively. The cost ratio profitability on a basic level is 68% while the cost level exceeds 40% so from 100 HUF production value we can realize 40 HUF income.

By defining the subsidy level in SPS system the production value and through this the results and efficiency are strongly modified. The result shows a positive value but its extent is far from the the level achieved by the original subsidy and also from the income that can be achieved after giving up production.

In the last part of the table we can see the results that can be achieved with the current subsidy environment. The change of production costs is visible in the cost ratio indicators and in the level of overhead. Looking at the results and efficiency we receive similar values as in the first calculation method.

Having examined the results of tobacco production I did the sensitivity examination, too. I examined four of the indicators that effect the result: yield change, price change (affecting the material and personal costs) and the output price change. I examined three scenarios in all factors; pessimistic, realistic and optimistic respectively. In the realistic situation the yield and the prices match the currently valid case which is in my model. In the pessimistic scenario I calculated with more unfavourable values while in the optimistic with more favourable values. In the case of yields and output (purchase) prices the change is significant compared to the realistic version because I did not use percentage difference but I calculated with the extremas that occur in the European Union. In the case of input prices I assumed two significant things, the change of personal type cost and material type cost, I assumed a 10% change in both negative and positive direction compared to the realistic scenario. (Table 5.)

*Table 5: Variables wich effect the results of the tobacco production*

<b>Variables in Virginia production</b>			
<b>Variables</b>	<b>Optimistic</b>	<b>Realistic</b>	<b>Pessimistic</b>
Yield (t/ha)	2,700	1,825	1,450
Price (k HUF/t)	540	280	216
Personal costs (k HUF/ha)	542	603	663
Material costs (k HUF/ha)	395	439	482
<b>Variables in Burley production</b>			
<b>Variables</b>	<b>Optimistic</b>	<b>Realistic</b>	<b>Pessimistic</b>
Yield (t/ha)	3,00	1,825	1,450
Price (k HUF/t)	500	240	190
Personal costs (k HUF/ha)	609	677	745
Material costs (k HUF/ha)	229	254	280

Source: own calculation

In the worst case when all variables turn out in a pessimistic way the Virginia production value is 7.733 thousands HUF (henceforth: k HUF) in the model farm while the income will be 1.684k HUF. This means 400k HUF income on every hectare. In the case of Burley the production value is 6.286k HUF the income is 902k HUF. This means a 225-425k HUF income per hectare.

It is visible that not even a drastic change in production issues, in certain cases more than 200% of the value, has any effect on the production to cause a negative result. Its reason is the current outstanding subsidy sum. If the subsidy ceases production is only profitable if at least 3 out of the 4 variables changes in an optimistic way and maximum 1 takes a realistic value. Obviously the available income would be of a much smaller magnitude than that of the one increased with the subsidy so even in the most favourable case we would realise around 160-350k HUF profit. In case there are two variables at a realistic value the result of the production in both types would be negative.

On the basis of the economic examination of tobacco production it can be stated that my first hypothesis: *„The planned subsidy system of tobacco cultivation endangers the maintenance of tobacco cultivation thus the producers could give up their activities”* referring to tobacco cultivation is proven.

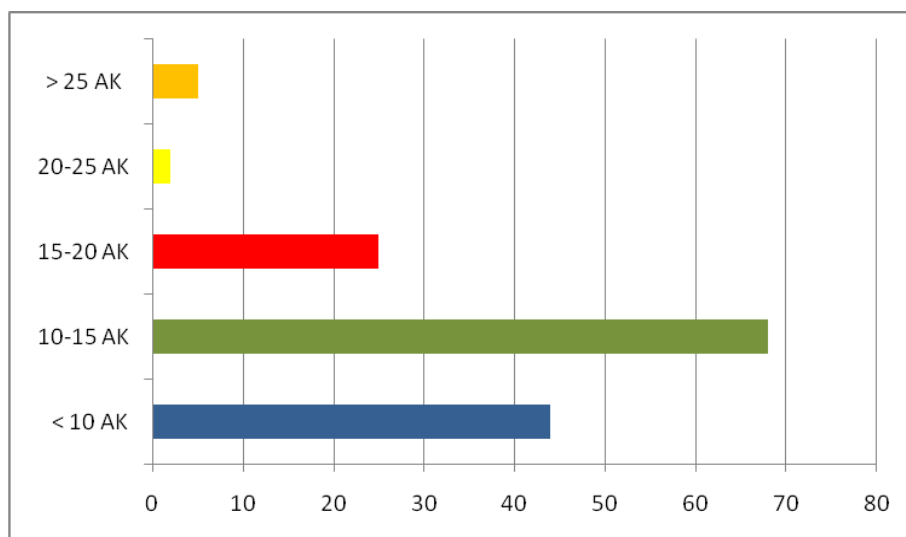
### **3.2 The assessment of the situation of those who left tobacco production**

My second objective was to find out what happened to those producers who had given up tobacco production in Hungary. Whether they stayed in agriculture or continued their activities in different sectors? I was searching for answers to how the affected producers evaluate their present situation compared to the period they spent in tobacco production. Also if they have a basis for comparison how they evaluate those crop production sectors compared to tobacco production.

My research showed that the producers I asked produced tobacco for an average of 19 years, the scattering was between 1 and 56 years. 65% of the people questioned continued the family tradition in the sector, 12% of them got acquainted with tobacco production at their workplaces while 23% took up tobacco production because of acquaintance's suggestion or other circumstances affected them. One quarter of the people interviewed gave the mistrust towards the EU regulatory and subsidy system as the reason for giving up tobacco production as well as its lack of transparency. This was followed by a 40% ratio of those who gave it up because of illness and old age, these two often correlate. We can conclude from this that tobacco producers considering their age represent the elderly age group which means that ageing is characteristic of the sector. We can mention other reasons as well such as low profitability (8%) and high production risk (7%). The producers questioned cultivated tobacco on an average area of 2.7 hectares, the smallest being 0.3 hectare while the biggest was



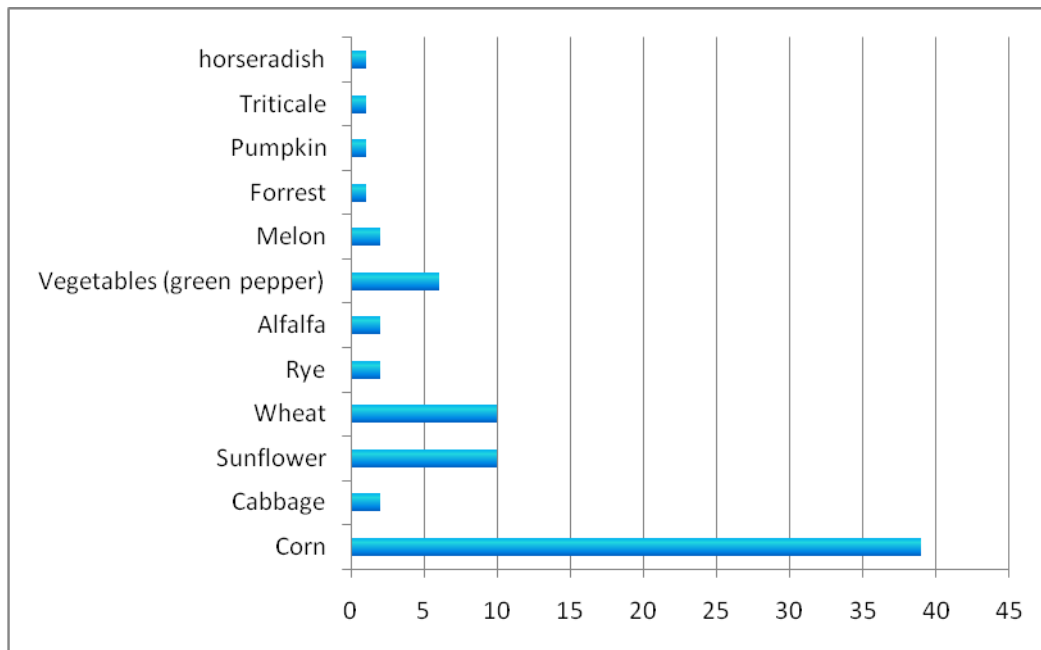
35 hectares. Almost 62 % of the respondents cultivated an area less than 1 hectare. The quality of the cultivated area is shown on Figure 2.



**Figure 2.: The quality (average golden crown value) of the tobacco cultivating areas of the respondents (2009)**

Source: own data gathering and illustration

Considering employment more than half of the respondents (70 respondents) produced tobacco based on family labour while the other half of the respondents used temporary outside labour to solve production. Production based on outside labour only was not present among the respondents. The research showed that after giving up tobacco production 55% of the producers stayed in agriculture with activities in other sectors. More than one-fifth (22%) of the respondents have sold, 15% have rented out the area and 8% of them had their lease expired. Those producers who turned to cultivating other crop chose mainly grain production. Close to 70% of the respondents cultivate corn, the others mostly cultivate cereal crop and sunflower while vegetable and fruit production are also among those sectors substitute tobacco (Figure 3.).



**Figure 3. The frequency of sectors substituting tobacco production (2009), persons**

Source: own data gathering and illustration

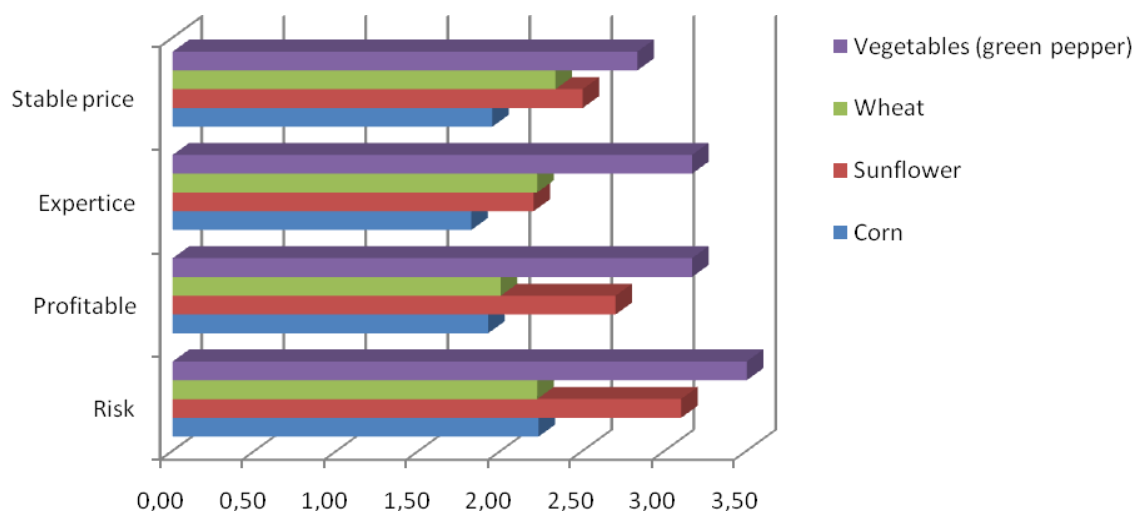
The evaluation of the particular sectors in the light of the respondents' opinion concerning the difference to tobacco production I was able to make only where the unit number made it possible ( $n > 5$ ). It was possible only in the case of four crop production sectors – corn, wheat, sunflower and vegetables (green pepper).

In the questionnaire I examined the following criteria:

- risk
- profitability
- market
- expertise
- contractual relations

I indicated only the significant indicators taking a 5% significance level as a basis. By looking at the results we can say that from the substituting sectors the price of wheat, sunflower and corn is less stable compared to tobacco and from these corn is the least stable while green pepper is similar to tobacco. The same can be said about expertise since the expertise necessary for corn production is relatively smaller while that of green pepper is similar to tobacco and it even exceeds it a bit. When it comes to profitability it is also only green pepper that exceeds the income that can be generated from tobacco production while sunflower, corn and wheat were judged to be less profitable by producers than tobacco production. We can say about the production risk that the cultivation of corn and wheat were judged to be less

risky, sunflower carried the same risk and green pepper was considered riskier a bit than tobacco production by the respondents. (Figure 4.)

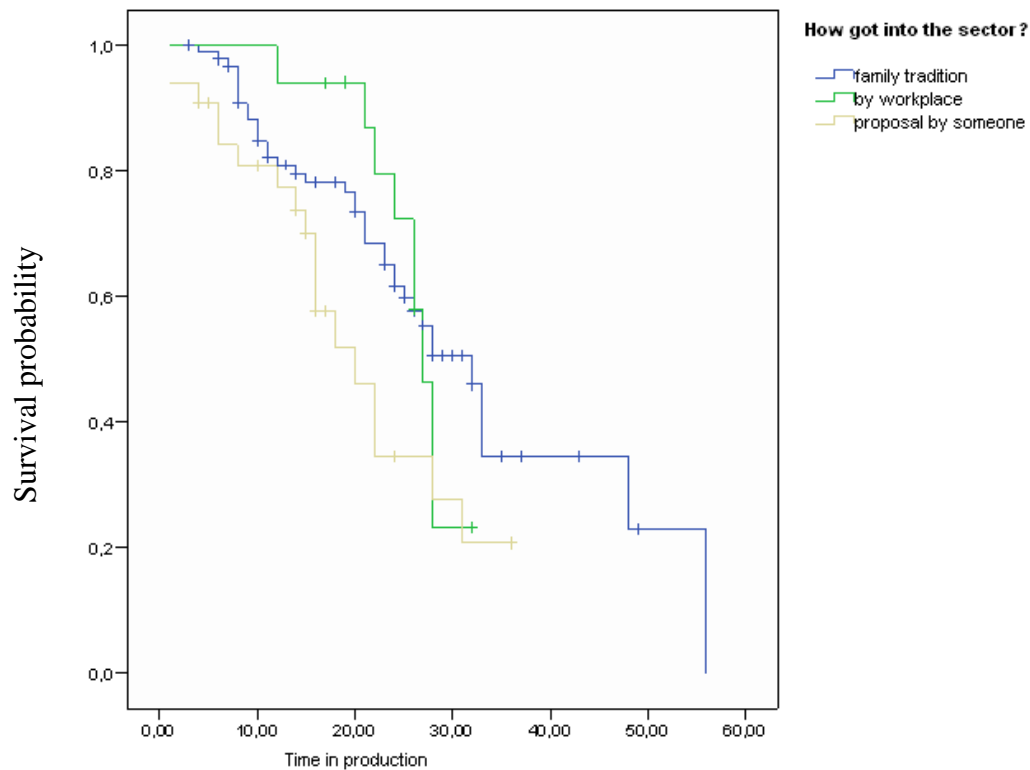


**Figure 4. The evaluation of particular sectors compared to tobacco production (2009)**

Source: own calculation and illustration

The respondents evaluated their current income and standard of living compared to the period they produced tobacco: 48% chose the category „similar”, 33% judge it „worse” and 16% „better” while 1.5% considered it „much worse” and the same number considered their situation „much better”. After evaluating the questionnaires we can say that almost half of the people questioned (48%) would return to tobacco production.

After the evaluation of the questionnaire I made a survival analysis from the results of which, because of content barrier, I would point out one detail and that is producers who got into the sector by following family traditions stick to the sector much longer than others. (Figure 5.) This proves the hypothesis that tobacco production is traditionally a „family” sector.



**Figure 5.: The producers' survival curve according to the way they get into tobacco sector**

Source: own calculation

In the sense of research my second hypothesis in my objectives is that: „*Those producers who gave up tobacco production in the last 5-10 years did not manage to stay in the agricultural sector; those producers who continued their activities in a different sector live and produce in worse conditions.*” is only partly proven. Since more than half of those producers who left tobacco production stayed in the agricultural sector but they judged the new sector to be generally riskier, less profitable and less stable than tobacco production.

### **3.3 The determination of the role of the tobacco sector in the budget and rural development**

The cessation of the national tobacco production would have a direct effect on the ventures which serve tobacco production and are built on that since the elimination of production would lead to the cessation of their Hungarian activities. This would have a very unfavourable effect from a rural development point of view mainly on employment and on the taxation of beneficiary settlements (e.g. local business tax).

It is a big challenge to estimate the affected people of the sector because specific data is only available in connection with those employees who are employed by the different firms and this shows only an average statistical number (staff). I made an estimate of the employees of tobacco producers based on an economic model. If we determine the number of workers in tobacco production according to a statistical average calculation then for all the Virginia cultivation about 1500 (1459) workers are needed. In this case 88% of the workers are unskilled, when it comes to Burley tobacco 93% of the needed workers 900 (886) are unskilled. The calculation of the annual statistical average in the case of temporary works does not give a real picture because it supposes a 12-month long continuous work, it only shows that in the case of permanent employment what number of workers could do the given job. In my estimate that would mean a temporary employment of almost 2400 people (Table 6.)

**Table 6.: The main characteristics of the people employed in the tobacco sector (2009)**

<b>Denominator (person)</b>	<b>Producers*</b>	<b>Processors</b>	<b>Total</b>
Number of employees	<b>2345</b>	<b>1407</b>	<b>3752</b>
permanent	224	1308	1532
temporary	2121	99	2220
Skilled workers	281	1315	1596
Unskilled workers	2064	92	2156
Women	1642	553	2195
Men	703	854	1557
Subcontractors		100	100

\* Estimate

Source: own calculation

During the gathering of data I assessed that in case of the cessation of tobacco production the direct workers of the related ventures, about 1500 would become unemployed out of which 23% have higher education and 6% are unskilled workers. At the companies examined 37% of the employees were women. These companies employ a further 100 people at other companies in the scope of outsourced activities (e.g. reception service, pay-roll accounting, cleaning etc.). Those firms which provide these services mainly make up a section of the concerned companies which means that in most cases their only commissioner is the given firm. Thus parallel to the cessation of the firms probably those jobs would be lost, too. To

sum up, close to 4000 annual statistical number of employees' job would be lost. This situation is aggravated by the fact that in production and primary processing the number of temporary workers is significant which means that indirectly the loss of 4000 jobs would affect much more people.

The operational environment of the firms and organisations working in the tobacco sector is indirectly affected by the taxes and contributions paid. By the termination of the sector the state revenues would decrease considerably. I used the 2009 annual balance and result statement of the companies for my analysis. I examined those revenues which directly affect the budget and for this I used the following items:

- corporation tax
- local business tax
- Value added tax (VAT)
- Employer's contributions
- Employee's contributions

The revenues paid to the state in 2009 by the tobacco producers and processors was 33 billion HUF (*Table 7.*)

**Table 7.: The paid taxes and contributions of the persons of the tobacco sector (2009)**

(thousands HUF)

<b>Denominaton</b> (person)	<b>Producers*</b>	<b>Processors</b>	<b>Total</b>
Corporation tax	n.a.	447 578	447 578
Local business tax	2 195	3 048 501	3 050 696
VAT	n.a.	24 658 457	24 658 457
Employer's contributions	824 453	1 608 230	2 432 683
Employee's contributions	749 122	1 580 323	2 329 445
<b>Összesen</b>	<b>1 575 771</b>	<b>31 343 088</b>	<b>32 918 859</b>

\* Estimate

Source: own calculation

Finally I determined all the budget expenses which were used for the subsidy of the tobacco sector and I compared it with the above calculated income. As a result I determined the balance of the payments. (*Table 8.*)

**Table 8.: The national calculation of the subsidy of tobacco production (2009)**

<b>Denomination</b>	<b>Virginia</b>	<b>Burley</b>	<b>Total</b>
Subsidy unit (100% of standard subsidy) (EUR/t)	2 981	2 384	-
Base area (ha)	4 088	1 800	5 888
Yield (t/ha)	1,8	1,8	-
Total subsidy (k Euro)	21 933	7 725	29 657
Total subsidy (k HUF)*	<b>5 921 800</b>	<b>2 085 724</b>	<b>8 007 525</b>

\* Calculated on 270 HUF/Euro exchange rate

Source: own calculation

On the basis of the calculation we can say that if the state would pay the 100% level of the tobacco production subsidy from its own budget then this would be around 8 billion HUF annually. I did not analyse the health care expenses because the social expenses of negative externalias are not taken into consideration in other sectors either. There is a 33 billion HUF income as opposed to a 8 billion HUF expense which means that the balance has a 25 billion HUF surplus revenue. (Table 9.)

**Table 9.: The balance of the state incomes and expenses of the tobacco sector (2009)**

<b>Denomination (k HUF)</b>	
Revenues from tobacco sector	32 918 859
Expense (total subsidy of tobacco sector)	8 007 525
<b>Balance</b>	<b>24 911 334</b>

Source: own calculation

We can state that the reservation of the sector besides the rural development and social factors is highly justified from an economic point of view as well. In this sense my hypothesis which was formed in my objectives that is „To maintain the current subsidy level of tobacco production means a lesser burden to the state than the termination of the production since the lost revenues and the emerging extra costs would supersede the current level of subsidy” is acceptable.

#### 4 THE NEW AND NOVEL SCIENTIFIC RESULTS OF THE DISSERTATION

The most important new and modern results of my thesis are the following:

- I made an overall economic examination of tobacco production both in respect of seedling and the cultivation of the two cultivated tobacco types (Virginia and Burley) in Hungary. I calculated the results in respect to several subsidy systems and subsidy levels. On the basis of my calculations **I proved by scientific methods the effects made by the different subsidy systems on the results and the negative result of the possible introduction of the SPS subsidy systems.**
- I elaborated a follow-up questionnaire and made 122 tobacco producers, who gave up tobacco production in the last ten years, fill it in. I consider new and modern result those statements that I made after processing the questionnaires about the period following the termination of tobacco production. During my research I compared the producer judgement of tobacco production and four other plough land cultures (grain, corn, sunflower, vegetables). **I ascertained that compared to tobacco production the production of grain, corn and sunflower are judged to be worse by the producers while the cultivation of vegetables is considered similar.**
- I determined the number and the composition of the employees of the sector and of the directly connected economic persons as well as the measure of the state revenues. **I proved that** the balance of the state payments of the economic persons of the sector and of the sector's subsidy is positive which means that the **reservation of the sector is justified from an economic point of view as well.**



## **5 THE PRACTICAL USE OF THE RESULTS**

Within the field of Hungarian economic research I found the overall examination of the sector a gap-filler, as well as the plant-level economic modelling of the management and the survey made among those tobacco producers who had left the sector. The results of the research help to see the current situation and the future prospects and challenges of the sector and lay out the direction of further research.

My results give guidance for the the decision makers of the field to lay out the development plans of the sector taking into account that the external factors affecting the tobacco sector greatly influence the future of tobacco production.

In the field of education the results of the thesis can be used for the subjects and subject materials of sector economy, the economy of industrial plants and food industry economics. The thesis shows the development of tobacco sector and its present situation thus the results of the examination can be used in several fields of education.

For those present ventures that deal with tobacco production this research can be valuable in a way that it is a lifelike examination of the revenue creating ability of the production at different subsidy levels and the effects made on the results by the changes of certain factors. I also consider it useful that I made a comparison of tobacco production with other plough field cultures.

## **6. PUBLICATIONS IN THE SUBJECT OF THE RESEARCH**

### **Scientific book in Hungarian with a summary in foreign language**

J. Borsos – **B. Bittner** (2004): Fenntartható-e a dohánytermelő körzetekben az ágazat fejlődése? Gazdálkodás, 2004/4 szám, 28-34 p.

**B. Bittner**(2007): Kistérségi vizsgálatok az Észak-Alföld régióban, in.: Agrártudományi Közlemények 2007/26. 158-163p.

**B. Bittner** (2008): A dohányágazat kilátásai az uniós támogatási rendszer változásának tükrében, in: Agrártudományi Közlemények 2008/29 45-51p.

### **Scientific jurnal in foreign language**

**B. Bittner** (2007): Opportunities for the inclusion of less-favored areas in the northern great plain region, Apstract (Applied Studies in Agribusiness and Commerce), 2007 Nr. 59-61 p.

### **Scientific book/issue in Hungarian language**

J. Borsos – **B. Bittner** – A. Mislovics (2006): A dohánykertész mester kézikönyve, Szaktudás Kiadó Ház, Budapest ISBN-13: 978-963-9736-04-7

### **Scientific chapter in Hungarian language**

**B. Bittner** (2006): Válságban a dohányágazat, in: Az agrárinnovációtól a társadalmi aszimmetriáig szerk: Jávör A.- Borsos J. ISBN: 963 9274 95X, Debrecen 229-233 p.

### **Editing Hungarian institutional issue**

**B. Bittner** (ed.) (2007): Ágazatspecifikus innováción alapuló projektek generálása a dohány ágazatban, Debrecen, ISSN: 1588-8665

### **Revised presentation published abroad in foreign language**

**B. Bittner** (2006): Opportunities of the less-favored area's inclusion in Észak-Alföld region, i The 4th Symposium "Natural resources and sustainable development" 933-937p, Oradea

**B. Bittner** (2008): Opportunities of tobacco sector due to changing of Union's subsidy system, International Conference on Applied Economics Proceedings, 799-803 p

J. Borsos - **B. Bittner** – A. Mislovics Kerékgyártó – T. Orosz (2009): Difficulties of diversification and alternative crops to tobacco in the European Union, Aspects and Visions of Applied economics and Informatics International Congress, Debrecen

J. Borsos – **B. Bittner** – A. Kerékgyártóné Mislovics – T. Orosz (2008): Rural areas and tobacco in European Union (31. UNITAB Congress Caceres, Spanyolország)

**B. Bittner** – J. Borsos (2011): Trends in European Tobacco Sector, Second AGRIMBA-AVA Congress 2011, 22-24th June, 2011. Wageningen University, Wageningen, The Netherlands

#### **Revised presentation in Hungarian with a summary in foreign language**

J. Borsos – A. Nábrádi – **B. Bittner** (2005): A társadalmi aszimmetriák feltárása és kezelése közgazdasági és más módszerekkel, III. Erdei Ferenc Tudományos Konferencia kiadványa II kötet 253-257 p.

**B. Bittner** (2006): Társadalmi aszimmetriák a Vásárosnaményi kistérségben, LXVIII. Georgikon Napok, Keszthely

**B. Bittner** (2007): A magyar dohányágazat helyzete és kilátásai, Tradíció és Innováció Konferencia, SZIE Gödöllő 2007. dec. 3-5.

**B. Bittner** (2007): Regionális különbségek okainak vizsgálata az Észak-Alföld régióban, AVA 3 konferencia, Debrecen, 2007. március 20-21.

#### **Publication in Hungarian without any summary in foreign language**

**B. Bittner** (2004): A hazai dohánytermesztés értékelése az Európai Unió csatlakozás kapcsán, Magyar Dohányújság, 2004/1-2 szám, 35-45 p.

J. Borsos – **B. Bittner** (2007): A dohány jövője I. Magyar Mezőgazdaság 2007/42 szám 12-13p.

J. Borsos – **B. Bittner** (2007): A dohány jövője II. Magyar Mezőgazdaság 2007/42 szám 16-17p

**B. Bittner** – A. Kerékgyártóné Mislovics – T. Orosz – J. Borsos (2011):  
A WHO stratégia vs. megélhetés (I.) Magyar Mezőgazdaság 2011/17. szám. 16-17 p.

**B. Bittner** – A. Kerékgyártóné Mislovics – T. Orosz – J. Borsos (2011):  
A WHO stratégia vs. megélhetés (II.) Magyar Mezőgazdaság 2011/18. szám. 16-17 p.