APSTRACT

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SCIENTIFIC PAPERS

PROBLEMS WITH THE APPLICATION OF CONVENTIONAL FINANCIAL RATIOS IN CORPORATE RISK MEASUREMENT

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Abstract: One of the enterprises' biggest fears is a potential bankruptcy situation. This is the reason there are a lot of people who try to anticipate it. To be aware of the actual and expected future situation of a company is in the interest of all those who are related. This topic has come to the fore after the economic and financial crisis of 2008. Companies, their creditors and internal stakeholders should be aware of the liquidity and solvency situation of a given company, because its deterioration can cause serious problems for all of them. During the financial analysis of companies, the problem of liquidity indicators showing bad signals can often be experienced, although there is no visible sign of difficulty in their operation. In other cases, the situation is just the opposite, i.e. liquidity ratios are adequate, but still, the business faces payment issues. How could it happen? The purpose of this study is to present indicators which can measure more accurately and reliably the actual liquidity position of a company.

Keywords: liquidity, adjusted liquidity, risk, cash conversion cycle, net working capital

Introduction

The economic crisis evolved from the international financial crisis highlighted the need of risk management. In the past years and recently, almost every company – either big or small – had the bitter experience of the crisis and its aftermath. There are numerous companies in worse conditions than before. Some of them bankrupted some of them are still fighting for survival. Companies and creditors and potential investors, e. g. venture capital investors (Nagy, 2004) should be aware of their own and their clients' liquidity position, because its deterioration can cause serious difficulties for both of them. Internal stakeholders also want to be aware of the current liquidity situation, because their present and future positions are also largely affected. Based on the above-mentioned problems, there is a strong and increasing demand for solutions that can forecast default risks in advance. Different financial indicators and models can be used for the forecasts. So far, numerous financial indicators have been developed and there are different prediction models, too (Chorafas 2002).

Traditional financial ratios cannot be emphasized enough to be used very cautiously. We should keep in mind that their signals can show the opposite of the actual situation. We also need to know that an accurate forecast can only be done by combining different ratios, and by developing complex forecasting models.

As a result of the uncertainties emerged and came to the fore in the economy, risk measurement and risk management have an ever greater role in corporate governance. Risk measurement has easier and also more complicated methods that the management can use to get indications of risks and whether it is growing or not.

Risk

According to Bélyácz (2004): 'Risk and uncertainty are two of the most controversial phenomena. Both of them affect business decisions, this has not ever been subject of debate, …' In economics, the principle of 'No risk, no reward' is well-known. This is of particular importance in the corporate sector. In the last few years, corporate operational risks can be concluded to be significantly increased due to several components. As a result of the crisis, Hungarian small and medium-sized enterprises had to face liquidity problems. These factors confirm the necessity of risk management and draw attention to that it is not a simple issue. A myriad of books and scientific articles deal with risk, but we can state that the definition of risk is not completely clarified. By this definition of risk we mean the possibility of an event to happen which is unfavorable and cannot be fully predicted in advance. We can also say that, risk means the chance of an unfavorable outcome.

Knight (2009)[1] in his study distinguishes risk and uncertainty which still spark debates to date. There are people accepting Knight's views, and there are others who don't. According to Tarnóczi and Fenyves (2010) uncertainty in one of the components of risk, accepting the increasingly spreading – and in environmental protection modeling relatively widely used – view (Molak 1997; Cullen and Frey 1999), that risk has two components: uncertainty and variability. As for Wilson and Shlyakhter (Molak 1997), this approach of risk is quickly spreading and getting widely accepted. Different authors state that uncertainty is related to the lack of information, knowledge and incognizance and it can be reduced by gaining access to more information and, cognition and knowledge. (In practice leaders of organizations would think the same, according to Bácsné's (2011) Change Management Studies, in which she asked profit orientated companies' leaders about that.) Variability means the heterogeneity of values in time and space and is in connection with the organization. It follows from this that variability cannot be reduced by more information, knowledge or cognition.

Wilson and Shlyakhter said (Molak 1997)[2] uncertainty can be defined by probability distribution and variability by frequency distribution. Vose (2008) splits risk up into the mentioned two exact elements, but he defines variability as a special case of uncertainty and calls them together total uncertainty. According to Tarnóczi and Fenyves (2010) not the risk and uncertainty should be differentiated by measurability, but the risk itself could be defined measurable and non-measurable. This kind of risk split up is an important aspect of decision making because it requires different management approaches.

Economic risk has a different interpretation of domestic and international literature. There are several types (financial, legal/regulatory, operative, reputation risks) differentiated. In the context of the financial crisis, financial risk gains more and more importance both theoretically and practically. Thomson (2005) defines the financial risk group as a group of risks generating value. That is, if a company appreciates in value as the result of risk taking, we talk about financial risks. In a company's life cycle, financial risk is inevitable. It is hard to define an economic activity in which some type of financial risk is not included. Distribution, purchase, production, investment, borrowing, all of them are areas where some type of financial risk included. Both domestic- and international literature mention more components of financial risk, including market risk, liquidity risk and credit risk.

To define liquidity risk, first the definition of liquidity has to be clarified. The term liquidity means that a company is capable to fulfill its obligations due (Murphy 2008). Horcher (2005) meant by liquidity the financial capabilities of a company to pay its current liabilities. According to him, the company faces liquidity risks, when its liquid assets are not enough for daily operations. This situation largely affects the company's growth potential (Horcher 2005). The lack of cash and cash equivalent assets manifests in a way that the time the receivables and current liabilities' payments are not synchronized. Practically, that means the accounts payable should be paid earlier than the accounts receivable is due. This difference in time between cash inflow and outflow can cause temporary payment difficulties. The liquidity position of a company can be consolidated by items from both sides of its balance sheet. On the assets side, more options are possible to adjust liquidity position. On the one hand, asset maturity dates can be mentioned, on the other, cash flowing from the sales. On the sources side of the balance sheet, attention should be paid on fall due dates of liabilities, credit structures and the sensibility of those two (Kulcsár, 2013). Liquidity risk has a double interpretation in English scientific literature. It means both surplus and shortage of cash. According to Lore and Borodovsky (2000), surplus of cash can also cause problems, but in my opinion, it is less significant than illiquidity. Actually, when a company has a surplus of cash and does not use it optimally (e.g.: keep it in bank deposits or invested in tangible, intangible or financial assets), it misses potential yields.

Working capital management – liquidity management and cash conversion cycle

Companies have to deal with ratios and company features much more thoroughly than they did before to be aware of their position, to know their financing facilities using their internal sources, to better utilize their own resources available. Ensuring internal sources at an appropriate level and continuous funding of company operations are topics closely linked to working capital management. Another reason of its importance these days – in conjunction with the previous – is that, nowadays companies work with ever longer payment periods, which means significantly longer term trade credits[3] than before. Companies should be able to finance those longer timeframes.

Working capital management

Working capital is crucial to determine a company's short-term financial status. Significant changes in working capital provide important information to the stakeholders. It is especially true for net working capital. Working capital analysis is one of the methods of credit rating and it can also help to understand the normal business cycle of a given company.

Tarnóczi and Fenyves (2011) defined the terms of working capital and net working capital because in domestic (and seldom in international) literature there are various interpretations of these definitions[4]. *Working capital (it is also*

[1]The unaltered issue of the book published in 1921.

[2]The volume contains studies of different authors.

[3]By trade credit we mean credits the company gives during the sale of a product or service.

[4]I think it is important to differentiate working capital (gross working capital) and net working capital, because it makes easier to use them as measurement tools, and last, but not least the 'net' expression can be better understood.

called as gross working capital) is the cash of the company that are invested in cash, accounts receivables, inventories and other current assets. Conventionally, working capital means a company's investment in current assets, which are expected to be converted to cash in less than a year.

An important indicator related to working capital management is *net working capital which can be defined as the difference of current assets and current liabilities of the company*, i.e. the part of current assets that is not covered by current liabilities. Net working capital can be considered as netting gross working capital *(Figure 1).* From a different point of view, *net working capital means the part of current assets that are financed from long-term financial assets or shareholders' equity, i.e. financed from long-term sources.*

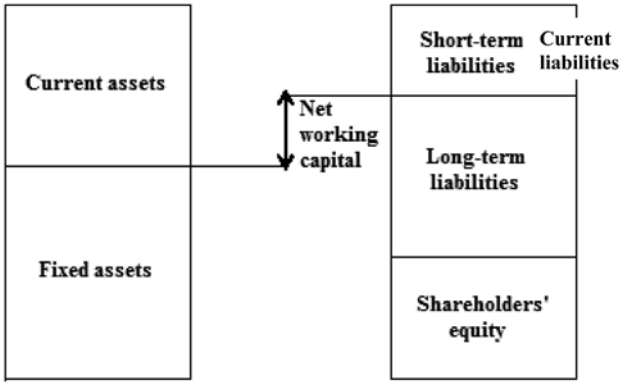

Figure 1: Net working capital

Net working capital can be split up in two: *net working capital need* and *net liquid balance*. Net working capital need is the sum of inventories and accounts receivables reduced by current liabilities excluding liabilities on bills and long-term loan payments due. Net liquid balance is the sum of cash and marketable securities reduced by bills and long-term loan payments due. We can calculate *sales to net working capital ratio* by dividing net working capital with sales. If the ratio has a high value, it shows a relatively high net working capital need compared to the level of sales. We need to keep monitoring working capital need continuously to know whether we have enough sources to cover operating expenses. Working capital related analyses cannot be separated from liquidity management and cash conversion cycle introduced in the following paragraphs because we can only get answer to the question if the company has adequate and sufficiently effective working capital management by the complex analysis of these three.

If we interpret working capital and net working capital as described above, then *working capital management* includes financing and managing current assets and controlling current liabilities of the company. Working capital management was originally appeared as a conventional financial controlling activity created for managerial purposes, to control the levels of current assets and current liabilities. Planning and controlling current assets usually requires the same, in some cases more proficiency and diligence, than dealing with fixed assets. Working capital management has a double purpose:

- to minimize the time period between utilizing initial inputs of materials and resources during the operational process and the final payment of goods and services obtained by customers, and
- to finance the most efficient assets primarily by optimizing the return on the capital invested.

One of the key elements of working capital management is liquidity management, that is, to maintain a company's ability to pay continuously because in the short-term, it ensures the company to stay afloat and in the long-term it justifies the its progress. Elimination of liquidity can cause a company ceased to exist *(Chorafas 2002)*. Accordingly, one of the most important corporate financial risks, the non-payment or default risk is related to liquidity management. Basically, the main tasks of liquidity management are to minimize risks, or we might as well say the development of an optimal financial structure.

Liquidity management

The effective liquidity management – beyond securing their survival – helps companies to reach higher profitability by reducing their input needs. Furthermore, it grants strategic advantages in the economically difficult time periods. In general, traditional liquidity ratios are used to measure the company's ability to pay *(Table 1).*

Table 1: Traditional liquidity ratios

Current ratio	Quick ratio	Cash ratio
$\frac{\textit{Current assets}}{\textit{Current liabilities}}$	$\frac{\textit{Current assets} - \textit{Inventories}}{\textit{Current liabilities}}$	$\frac{\text{Cash + Securities}}{\text{Current liabilities}}$

If we look into the formula of the current ratio, an obvious correlation can be found with the net working capital. The current ratio is also called working capital ratio. As a result of this correlation, if the company meets the required level of current ratio, the net working capital will be positive. We can also conclude that current ratio should not be less than 1 to have a positive net working capital ratio. Current ratio was formerly called as a 2:1 ratio indicator, but these days its value between 1.3–1.7 is acceptable – depending on the sector. If the lower bound of this ratio is concerned, one can conclude that at least 30% of current assets have to be financed by long-term sources. This is the evidence that net working capital can be used as a liquidity indicator, i.e. inadequate net working capital shows illiquidity risk of a company.

With positive net working capital we can assume that the company will be able to comply with its obligations during the fiscal year, it is solvent. This is not necessarily always true, because net working capital – just like current ratio – is not the most accurate indicator to determine liquidity, because only cash and short-term investments (securities) are truly liquid assets. High net working capital can be a result of highly invested accounts receivable (as a result of customers' delayed payments or non-payments) and/or because of increased

inventories. Logically, due diligence is needed during the interpretation of liquidity ratios. Changes in net working capital ratio can be a result not only of changes in current assets and current liabilities, but shareholders' equity, long-term liabilities and fixed assets also affect.

Therefore, it is worth considering and calculating with all three indicators, because this is the only way to avoid bad decisions and to be aware of the company's liquidity risk. In my opinion, cash ratio is the most important to calculate a company's liquidity position. Normally this ratio does not have a minimal threshold level, but I think – considering the method it is calculated – the 0.25–0.3 level is acceptable. It means the company could pay 25–30% of its current liabilities immediately.

Traditional liquidity ratios should be also noted not being accurate in all cases. It comes from the basic characteristics of financial statements. They do not always show a true picture regarding the liquidity of a company, overestimation and underestimation can also occur. Liquidity ratios would be important to follow precisely but this would require companies to close accounting records monthly or quarterly.

Liquidity ratios *(Table 1)* do not focus on cash-flow timing and synchronicity sufficiently. As cash outflows and inflows are usually not synchronized, insufficient attention on timing could mean handicaps in liquidity analysis. The cash conversion cycle, knowledge of cash cycle and its analysis can help to solve these problems.

Cash conversion cycle

Essentially, the definition of cash conversion cycle covers almost the whole field of working capital management, including inventory-, receivables- and debt management, but it is also closely related to funds management. If we want to shortly define the principle of cash conversion, we could summarize it as the following: get the money other companies owe you as soon as possible and try to delay the payments due as long as possible *(Nobanee and AlHajjar 2009)*. It is quite obvious, that everybody knows this and it is also clear that it is not that simple. There are a lot of factors affecting its implementation. However, everybody has to deliberate on it and conclude whether one has done everything he possibly could to comply with this principle. The shortening of cash conversion cycle results in releasing cash which free cash can be invested in different areas. However, a bad cycle shortening can also cause problems: inventory shortages and loss of customers who buy on trade credit can result in decreased profitability.

It is very important to note that cash conversion cycle is one of the tools to measure liquidity. Its essence is the measurement of the difference between cash inflow and outflow and additional funding requirements. The conventional cash conversion cycle also has weaknesses. It does not assign the proper amounts of working capital required to the days of conversion periods, nor does it express the effects of liquidity on profitability.

Admitted receivables and inventory turnover ratios are better indicators for liquidity management in the operating cycle. The definition of operating cycle acknowledges that the financial costs of production and the products' sales revenue are neither instant nor synchronized. The cumulated turnover period (days) of inventories and liabilities of a company sets the length of the operating cycle *(Figure 2)*.

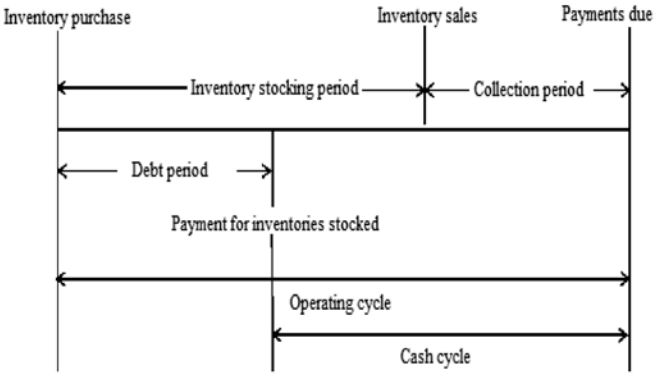

Figure 2: Cash conversion cycle

The operating cycle starts with the purchasing of raw materials and services that are used up during the process of production along with semi-finished and unfinished products to become finished ones. Operating cycles can largely differ company by company. Operating cycle has two parts. The first is the so called *inventory stocking period*, which lasts from the purchase of resources needed for the production till the sales of the resulting products and services. The second part is the so called *collection period*, which lasts from the sale of products on credit until the money is received.

A simple extension of the concept of operating cycle leads to the *cash conversion cycle* (cash cycle), which can be defined as the time period from the payment of raw material and service purchases and lasts until the company is paid for finished and sold products and services. These activities create a network of cash inflows and outflows. These flows are not synchronized and uncertain. They are not synchronized, for example, because the time of payment of raw materials and services differs from the time the company receives money for its products sold. They are uncertain, because future sales and costs cannot be precisely predicted. In conclusion, the operating cycle is the period of time that is needed for inventory stocking, product sales and cash collection.

In essence, operating cycle shows how a product moves between current asset accounts. Step by step, the product gets closer to become cash, or we could also say it gets ahead in the liquidity preference.

Nor cash-flows and other events are synchronized. The period of days we have not paid for the inventories received is called *debt period*. If the company sells some of its inventory later on but does not receive cash for it instantly, it has to manage the financing from somewhere else (cash cycle). *Cash cycle* measures how long (how many days) the cash assets of a company are tied in the production and product sales periods. According to this definition, *cash cycle is the difference between operating cycle and debt period*. Figure 2 shows that short-term of financial management is needed

for the interval between cash inflows and outflows, which are related to the length of the operating cycle and the debt period. The gap between short-term money inflows and outflows can be filled by loans or by holding liquid reserves (cash or marketable securities). In other words, the gap can be reduced by shortening inventory stocking-, collection- and payment periods *(Ross et al., 2008)*.

Based on the above mentioned the question arises whether there is a chance to develop an optimal cash conversion cycle. Optimal cash conversion cycle can only be calculated if we are able to define the optimal size of its components. To determine the optimal sizes, we can use Economic Order Quantities (EOQ) applied in inventory management *(Ross et al. 2008)*. Using this model we can define the optimal inventory stocking- and collection period, which together equates the optimal operating period. After calculating the optimal debt period we can get to the optimal cash cycle, too. To compile such a model we need the combined use of econometric and optimizing models.

Modified indicators (adjusted liquidity index and modified cash conversion cycle)

Adjusted liquidity index

Liquidity ratios are closely related to bankruptcy situations but they do not sufficiently take into account how long their components are tied to the operation of the company. However, the time it is tied or it is working can substantially affect how quickly a company can fulfill its payment obligations and it also alters the of liquidity ratios values, too. To solve this problem, the components of current assets and current liabilities should be adjusted first, and these numbers should be used during liquidity calculations. The balance sheet items used during liquidity calculations should be adjusted by the time those are in the operating cycle, what conventional liquidity ratios ignore. An adjusting factor (1) has to be calculated for each item to be adjusted. By multiplying the item with the adjusting factor we get the adjusted value:

$$\text{Adjusting factor} = 1 - \frac{1}{\text{turnover rate of an asset or source}} \quad (1)$$

In case of current assets only inventories and accounts receivables are adjusted. In short-term liabilities, liabilities of bills and current portion of long-term debt should not be adjusted. After the adjustment, we can calculate the values of the adjusted current assets and adjusted current liabilities which we can use to calculate the adjusted liquidity ratio (2):

$$\text{Adjusted liquidity ratio} = \frac{\text{adjusted current assets}}{\text{adjusted current liabilities}} \quad (2)$$

This ratio (2) can be improved by increasing the turnover ratio of inventories and accounts receivables and decreasing the turnover ratio of current liabilities, i.e. by improving the asset- and resource management of a company. This indicator can have a higher or lower value than the liquidity ratio has. However, if a company manages its current assets and current liabilities efficiently, then the value of the adjusted liquidity ratio will be higher than the liquidity ratio. *(Gangadhar 2003)*.

By using the adjusted current assets and current liabilities, the rest of the liquidity ratios can also be calculated.

Liquidity indicators are also closely related to the cash conversion cycle, because its main components are inventory stocking periods, collection periods and debt periods. We can also conclude that by increasing the adjusted liquidity ratio, cash conversion cycle will be shorter, which ultimately leads to more effective cash management.

Modified cash conversion cycle

The weakness of conventional cash cycle is that it cannot properly express the days of a conversion period in net working capital need, which is measured in cash. On the top of that, the model does not distinguish the sales in cash and credit properly. This can cause problems for example in cases when two companies have the same claiming period but a different proportion of sales is in credit. In the conventional model both companies have the same cash cycle but in reality the one that sold products in cash payment will have a better position to pay its obligations in time. As a result, it will be able to get the majority of its sales revenue faster and more safely than the other *(Matz and Neu 2007)*.

The conventional cash cycle model does not deal with the impact of profitability on liquidity. The model only calculates the difference between the resources used for generating operating income and the revenue received. It does not take into account that the revenue gained will be higher than the expenses by the margin of profit. As the profit is a surplus of sources to cover expenses, profitability can be deemed as a total company liquidity supporting factor. It is clear from the foregoing that the gross return on sales profitability and the "sales on credit/total sales" ratio should be included in the cash cycle model. The resulting adjusted cash cycle model can be used to calculate net working capital which is defined in monetary terms, i.e. to determine the amount of net working capital in cash required for operation.

In conclusion, the modified cash cycle can be calculated by adjusting inventory stocking periods by gross return on sales profitability (3) and the modified collection period by adjusting collection period with the proportion of sales on credit (4):

$$\text{adjusted stocking period} = \text{stocking period} * (1 - \text{gross return on sales}) \quad (3)$$

$$\text{adjusted collection period} = \text{collection period} * \text{proportion of sales on credit} \quad (4)$$

In formula (3) in the numerator to calculate gross return on sales there is the difference between sales and expenses of products sold and it does not include other incomes and company operation related expenses.

Materials and method of analysis

Risk and liquidity have a prominent role in a business's operation, as follows in case of an agricultural business too, so that liquidity was analysed as a risk factor based on the data of the chosen agricultural companies' annual reports. Database of the investigation has been chosen in a way that a relatively high number of companies are present in the given agricultural field, which provides a sufficient number of data for the analysis. The analysed companies are selected out of the Hungarian agricultural companies whose main activity is denoted *"Growing of cereals and other crops n.e.c"*. Selection of companies was taken place in OPTEN company information system and the analysed data, data of the annual reports, were downloaded from the Electronic Annual Report's Portal (e-beszamolo), where the substantial part of data are available in „html"[5] format. Data of the agricultural company's annual reports were collected in a period of 5 years, from 2008 to 2012. In Hungary altogether 1700 companies denoted the mentioned activity as their main professional activity. The analysed sample's scope was reduced based on two criteria: firstly, the amount of revenue, secondly, the number of employees. Accordingly, the analysis only involved companies having revenue of 100 million Forints or more and at least 10 employees. Out of the selected 1700 companies, 1290 did not satisfy the two conditions and the annual reports of 180 companies were only available in a "pdf" format. Out of the 230 annual reports 101 were subtracted from the sample, because they were abridged annual reports. The data of the remaining 129 companies were analysed with the help of the box plot chart and 47 companies having extreme data were also eliminated from the sample. This way the annual report of 82 companies provided the actually processed sample, which accounted for 4,82% of the total companies dealing with *"Growing of cereals and other crops n.e.c"*. The analysis carried out was built on R Statistics, as a solver program. In R Statistics contains packages (modules), which were necessary for the analysis. R Statistics is an open-source software having countless options for analysis, representation and modelling, and it can be linked to Excel spreadsheet program, by which it is easier to handle databases.

Liquidity analysis based on agricultural companies

The analysis regarding trends of liquidity ratio and adjusted liquidity ratio will be presented. Based on the calculations, 82 companies analysed show a high volatile image concerning homogeneity. Analysing statistical characteristics of the ratios, it is apparent, that the value of standard deviation is growing in all four examined areas; ratios' relative standard deviation is over 60% in every case.

In the examined 5 years values of liquidity ratio and adjusted liquidity ratio regarding 82 agricultural companies were classified in 8 categories. Table 2 shows the defined categories.

Table 2: Categories defining classification of liquidity ratios

Category	Value
1.	< 1
2.	1–2
3.	2–3
4.	3–4
5.	4–6
6.	6–8
7.	8–10
8.	10–

Table 3 indicates an allocation among categories after the correction. In case of liquidity ratio companies belonged to the category 1 represented 10–12% of the total, while in case of the adjusted liquidity ratio the same value is 20–22%. It demonstrates that after the allocation among each category adjusted liquidity ratios have lower values, so that the companies' liquidity has deteriorated. In case of both liquidity ratio and adjusted liquidity ratio considering the first 4 category together, in all the examined 5 years; approximately 70% fell into this category in 2008, but this value was only about 50% in 2012. Looking at the last two categories, we can also discover the growth of the rate of liquidity ratio in this second category. Overall, we can conclude that the allocation took place in a way, that the ratio of the businesses having lower liquidity worsened, while the businesses having high liquidity improved their results.

It is also confirmed by the result of the descriptive statistics *(Tables 3 and 4).* During the comparison of the statistical characteristics of liquidity ratio and adjusted liquidity ratio, it is observed, that the indicators below the average is lower, while the indicators above the average is higher in case of adjusted liquidity ratio.

Analysing the values of average *(Tables 3 and 4),* it can be noticed that the values of adjusted liquidity ratio are higher, the liquidity of businesses improved, and the difference between the two ratios are growing over the examined time.

Table 3: The values of liquidity ratios' statistical characteristics

	2008	2009	2010	2011	2012
Minimum	0,37	0,33	0,27	0,50	0,61
1st quartile	1,48	1,36	1,56	1,55	1,84
Median	2,66	2,37	3,12	3,30	4,02
Average	4,55	4,56	6,39	5,95	7,50
3st quartile	4,22	5,24	6,13	7,71	7,23
Maximum	37,15	32,05	94,46	44,26	90,42
Standard deviation	6,16	5,92	11,64	7,22	12,89

[5] „html" format allows a faster, programmed recovery of data and also the building table forms, while in case of „pdf" format data should be recorded again.

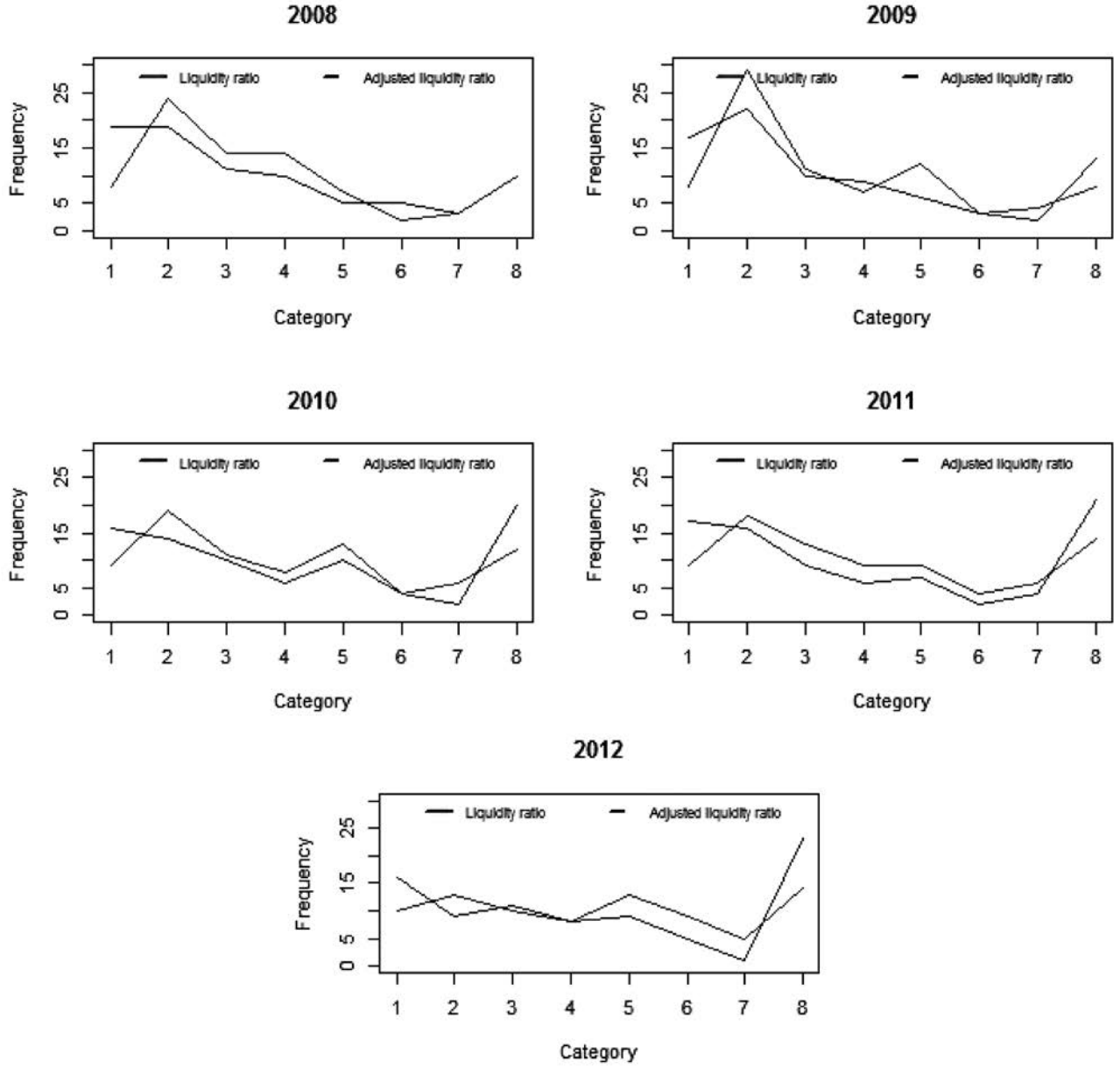

Figure 3: Changes in the values of liquidity ratio and adjusted liquidity ratio (2008–2012)

Table 4: The values of adjusted liquidity ratios' statistical characteristics

	2008	2009	2010	2011	2012
Minimum	–0,42	–3,35	–13,85	–66,58	0,11
1st quartile	1,18	1,15	1,17	1,23	1,38
Median	2,25	2,17	3,13	2,93	3,55
Average	5,46	5,19	8,97	8,19	15,92
3st quartile	5,62	5,54	9,48	10,03	11,33
Maximum	47,99	37,30	147,40	70,74	227,00
Standard deviation	8,60	7,62	18,52	16,32	36,22

Table 4 demonstrates that there are negative values in 4 years regarding the minimum of adjusted liquidity ratio. Adjusted liquidity ratio can have a negative value, if the turnover ratio of the items to be adjusted (inventories, accounts receivable, current liabilities) has a value lower than 1. *Tables 5 and 6* indicate that there are values below 1 concerning the turnover ratio of inventories and accounts receivable.

Table 5: The values of the inventory's turnover ratios' statistical characteristics

	2008	2009	2010	2011	2012
Minimum	0,67	0,59	1,06	0,54	0,83
1st quartile	1,85	1,75	2,14	1,92	1,93
Median	2,88	2,83	3,31	2,87	3,05
Average	3,48	3,74	4,02	3,46	3,88
3st quartile	4,21	4,55	4,56	4,71	5,19
Maximum	17,65	14,86	19,99	12,09	26,67
Standard deviation	2,64	3,00	3,04	2,15	3,40

The value of turnover ratio under 1 refers to effectiveness problems of the companies' working capital management. Because high value of turnover ratio is one of the indicators assessing the company's effective working capital management. At the same time, the average of adjusted liquidity ratios *(Tables 3 and 4)* showed a higher value than the average of the liquidity ratio in every year, which means that in general the companies' working capital management is effective. Even though there are inefficient and efficient businesses included in the sample, the rise tipped the scale for the latter one.

Table 6: The values of the accounts receivables' turnover ratio statistical characteristics

	2008	2009	2010	2011	2012
Minimum	0,75	0,59	0,44	0,36	1,40
1st quartile	3,73	3,52	3,89	3,12	3,17
Median	5,24	5,19	6,32	5,40	5,16
Average	7,30	7,36	9,51	7,59	9,97
3st quartile	8,11	9,70	11,52	8,32	8,01
Maximum	47,63	39,53	58,42	61,06	259,80
Standard deviation	6,58	6,56	9,94	8,39	28,59

Conclusion

The companies, their creditors and internal stakeholders should be all aware of the given company's liquidity, which can be analysed by different liquidity ratios. Conventional liquidity ratios do not consider properly how long are the assets tied in companies operation, which largely affects the value of the liquidity ratios. As for the results of the adjusted liquidity ratio, based on the analysis, I conclude that the values of companies having lower liquidity worsened, while companies fell into higher categories improved their liquidity.

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A MULTI-DIMENSIONAL ETHICAL APPROACH TO ACCOUNTING AND REPORTING PRACTICES

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Abstract: Purpose – The purpose of this research is to find out the multi-dimensional ethical approach to accounting and reporting practices going on in India and abroad. What has been the shift in Reporting Practices by Indian companies? What drives the Indian companies to report on the non-financial matters?

Design/methodology/approach – This paper mainly focuses on the inclusion of Non-Financial Matters in the Corporate Annual Reports. An Empirical Survey was carried out and the questionnaires were administered to 122 respondents comprising of 75 academicians and 47 chartered accountants. This paper compares the perceptions of academicians and accounting professionals on the ethical reporting practices of the Indian companies.

Findings – The results were tested using the t-test analysis. The research suggests that more companies should report on their environmental, social, and corporate governance performance and find a way to express them in their Annual Reports and the reporting of data regarding the carbon emissions, energy use, pollution, impact on the local economy, etc., should be made mandatory for companies.

Research limitations/implications – The research included respondents who are currently living in Delhi. For more generalized opinion nationwide survey can be carried out. Another important category of stakeholder for judging the usability of Corporate Annual Reports could be the Institutional Investors.

Practical implications – The results of this study would help the policy makers in framing the guidelines for standardized annual reports, synergizing social and business interest needs on top priority. Corporate philanthropy needs to transform into the realm of core business and corporate social responsibility. Integrated reporting could pave the way for synthesizing financial and non-financial reporting into one form and give a holistic view of companies' strategies to its stakeholders incorporating new dimensions of IFRS.

Social implications – More emphasis on Non-financial matters will certainly contribute in making the corporates more responsible to the society, environment, and to the future generations.

Key words: Corporate Annual Reports, Sustainability Reporting, Environmental Reporting, Multi-dimensional ethical reporting, Integrated Reporting

Businesses are now operating in an "age of transparency". Demands for greater information on corporations' activities come from all sectors of society, including shareholders, consumers, communities, special interest groups, and governments. Under a New Governance perspective, disclosure of corporations' performance information is necessary to ensure accountability and to provide information that allows stakeholder participants to identify best practices and learn from the experiences of various corporations. In more recent years, growing social (e.g., poverty, deteriorating social equality, and corruption) and environmental (e.g., carbon emissions, water usage, and waste) concerns have pressured companies towards a more systematic treatment of sustainability reporting; through reporting, the firm would disclose how it is utilizing, developing (or depleting) and more generally affecting human capital and natural resources. Furthermore, due to several high-profile corporate scandals and the recent global financial crisis, there has been a general sense of disbelief regarding companies' ability to self-improve and a belief that existing company disclosures tell a partial story regarding past corporate performance and future prospects. The global economic fallout and rising concern with sustainable growth and climate change has spawned a new breed of ethical investors. They are urging companies to report on the environmental and social costs of their operations and improve corporate governance.

Ethical approach to accounting and reporting

A business or company is considered to be ethical only if it tries to reach a trade-off between its economic objectives and its social obligations, such as obligations to the society where it exists and operates; to its people for whom it pursues

economic goals; to the environment, from where it takes its resources; and the like (Rituparna, 1999) . The dramatic collapse of some big corporates such as Enron, WorldCom or the well-known auditing firm Anderson in the US and Satyam Software Services in India showed that even successful companies could ultimately come to grief, if their managers did not practice the basic principles of honesty and integrity. Even though code of conduct or a set of values cannot prevent unethical activity by top management completely, but they can at least act as a means of detecting such activity before it is too late (Sharma, 2011). A company should possess a number of divergent qualities to be accountable to its society. In the literature, at least four corporate virtues can be found.

1. *The reliable company.* According to Cadbury (1987), Openness, is the best way to unarm stakeholders who are wary of a company's aims or actions. Needless to say, the reliability of a company will be called into question should stakeholders discover that the company withheld relevant and potentially harmful information from them (Cormier and Gordon, 2001).
2. *The responsible and accountable company.* Freedom implies responsibility; and responsibility implies accountability; and accountability implies transparency. Corporate social responsibility implies corporate social accounting and *vice versa*.
3. *The company with integrity.* The integrity of the company is also sometimes taken as starting point. Petrick and Quinn (1997) contend that by keeping stakeholders informed, a company asserts its authenticity and integrity. Hiding information on important and relevant matters from stakeholders is undesirable as it impairs the integrity of the company.
4. *The truthful company.* Some scholars advance truthfulness as an important virtue. Solomon (1993), is of the view that honesty is the first rectitude of conduct of business. Honesty provides stakeholders access to the facts on matters that interest them. A truthful company is open and transparent to the public.

Ethical reporting gives the result in following ways: 1. Improved functioning of the market. 2. Reduction of socially unacceptable behavior. 3. Contribution to the resolution of social problems.

Introduction – Corporate Annual Reports (CARs) & their significance as communication medium

The aim of accounting is to communicate economic message on the result of business decision to the users from time to time. Thus corporate reporting is total communication system between a company and users. Company Annual Report is a significant medium of corporate reporting today, although information about a company's affairs can be communicated through other media also e.g., prospectus, financial press release, interim report, media news about company, and personal contact with company officials. Despite the existence of different sources of information, the annual report is regarded as the most important source of information about a company's affairs. All groups have access to it; their attitudes may be influenced by it. Its importance looms large not only in company-shareholder relations but also in company-society relations.

The traditional formal communication vehicle between a publically listed entity and its interested constituencies is the **Corporate Annual Report**. Nowadays CARs are carrying more and more information and the intention is to present this in such a way that it satisfies the relevant economic needs of various stakeholders.

The bulk size of annual reports is reflecting the growing disclosures and details that annual reports convey, e.g. the Infosys annual report of 1995–96 contained 96 pages and the one for the 2009–10 had 166 pages (including Sustainability report). If we look in company to company basis, by and large in physical/ quantum terms, the disclosure has probably on an average doubled over the last ten years. The Annual Reports generally, contained a director's report, the auditor's report, the financial statements- Balance Sheet, Profit and Loss Account and Schedules along with certain additional information required by the companies Act like statement of particulars of employees, quantitative data regarding production, turnover and statement regarding energy conservation measures, and so on.

Shift in disclosure patterns of CARs

If we compare that with today's disclosures, both statutory and voluntary, we find a major shift- a change for the better.

The primary reasons for this change are:

- The growing number of stakeholders is now interested in using the annual report.
- The changing/growing expectations of users-stakeholders, and
- The requirements of newer legislations.

Some companies show CSR Report, Sustainability Report separate and most make a section in their Annual Report for these matters. The amount of information disclosed by MNEs in corporate reports has expanded considerably in recent years. The major source of pressure for increased disclosure has been the financial and investment community. Both MNEs and standard setting bodies in countries with well-developed securities markets, such as the United States, the United Kingdom, France, Germany, and Japan, have been concerned primarily with responding to pressures from this direction. There has also been something of an explosion in the demand for information by a wide range of other participant groups including governments, trade unions, employees, and the general public.

Studies reveal that internationally listed MNEs tend to disclose more information voluntarily. There were a significant negative association between disclosure and inflation, possibly owing to the higher inflation levels in emerging markets. At the same time, disclosure was significantly positively associated

with market capitalization, number of foreign listings, dividends, and the use of a large multinational auditor.

Disclosure behavior may also be explained by different attitudes and practices relating to corruption. If corruption hinders economic development, then it may also hinder financial reporting transparency due to the secretive nature of the corrupt activity itself.

La Porta et al. (1998) include corruption as one of the negative enforcement variables. They demonstrate a negative relationship between corruption and accounting standards: the higher the level of corruption in a country, the poorer the quality of its accounting.

Following is the list of contents of Annual Report of a Company. Though there are not stringent patterns to be followed, as far as non-financial information is concerned, these items are generally found in Annual Reports of reputed companies, which are leaders in all respects.

Contents of a Standard Annual Report of a Progressive Company

Theme: This part covers a new idea which communicates the ethos, vision and setting of the company, its team and its associates and shares this in text and pictures bringing the company and its image live in the minds of the readers.

The year at a glance, Letter to the shareholders, Awards for excellence, CEO and CFO certification, Directors' report- Directors' responsibility statement, Particulars and information pursuant to Company's Act 1956- on conservation of Energy, R & D, Foreign Exchange, particulars of employees, etc., Auditors' certificate on Corporate Governance, Financial statement- Indian (GAAP), Management's discussion and analysis of financial condition and results of operations. Auditors' report, Balance Sheet, Profit and Loss Statement, Cash Flow Statement, Schedules, Balance Sheet abstract and company's general business profile, Consolidated Financial Statement- Indian GAAP. Risk Management Report, Corporate Governance Report, Additional Information, Shareholder Information, Share-price Chart, Selective Data, Ratio Analysis, Statutory Obligations, Human Resource Accounting, Brand Valuation, Balance Sheet (including intangible assets), Current-cost-adjusted financial statements, Intangible assets score sheet, Economic Value Added (EVA) Statement. Management Structure, Charitable initiatives, Report on Environment, Health, & Safety.

Literature review

This review examines the disclosure practices adopted by various corporates and the factors governing such changes. Mastrandonas and Strife (1992) find that stakeholders demand disclosure of company's environmental information because of the magnitude of liabilities and cost associated with environmental issues. They say that corporate should consider using environmental annual reports to communicate with their stakeholder and that will foster their partnership.(Kolk and Pinske 2011) analyzed to what extent corporate governance has become integrated in MNEs' disclosure practices on CSR. Based on an analysis of CSR reporting of Fortune Global 250 companies, findings show that more than half of them has a separate corporate governance section in their CSR report and/ or explicitly links corporate governance and CSR issues. It was found that MNEs which disclose information on a wider variety of social and environmental issues and frame CSR with a focus on internal issues are more inclined to integrate corporate governance in their CSR reporting. (Madhani 2011) The annual reports of twenty (20) Indian corporate entities for the financial year 2007-08 were taken as sample. The sample company includes ten (10) public sector companies and equal number of private sector companies. The study has revealed that corporate entities have put some efforts to preserve the environment. Out of sample companies 75% (7 public and 8private) of them disclosed that they have put emphasis on reduction of emission of greenhouse gases from their industrial plants. Again, 60% of the sample companies have undertaken afforestation drive as trees can contribute important role for the protection of environment and maintaining ecological balance by sinking carbon dioxide and generating oxygen. 65% of the sample (7 public and 6 private) companies have adopted policy of reduction in uses of natural resources, reuse of such resources and recycling of the used resources.

(Murthy, 2008) study conducted on 16 top software firms in India concluded that human resource category was most frequently reported attributes followed by community development activities and environmental activities was least reported. The annual reports in the sample were analyzed in order to quantify the voluntarily disclosed corporate social information using the content analysis technique .The study was sector specific and covered only software firms. (Choi and Mueller, 2007) Corporate operations, for the most part, concern themselves with production processes and technological innovation. These activities, however, do not take place in a social vacuum and corporations both domestic and multinational are being called upon to account for social responsibilities that transcend purely "bottom line" concerns. Social responsibility disclosures are an integral feature of this behavioral phenomenon.

Finally, corporations should recognize in self-interest the importance of anticipating public opinion on matters of social concern. A reputation of being an enlightened employer with a sincere regard for environmental responsibilities translates directly into future economic dividends such as low levels of industrial disputes and favorable government relations. (Jones, 2010) Companies could provide a statement of their corporate philosophy towards the environment in the annual report or stand-alone environmental reports. In particular, identifying any threats they recognize and, in particular, whether their business activities potentially contribute to those threats. Whether the company recognizes a duty to act and what in broad terms it intends to do. A statement of its attitude to sustainable development and how it

operationalizes sustainable development should be the part of its communication with its stakeholders. Compliance with a clear comprehensive set of time-series performance indicators either internally devised or externally such as the GRI. These should embrace, inter alia, targets on water, waste, recycling, energy, pollution, biodiversity and, in particular, given the current concerns with climate change comprehensive details of air emissions, particularly tonnes of carbon dioxide (Daske and Gebhardt, 2006). The mandatory adoption of IFRS has been motivated by the need to ensure greater comparability and a higher transparency and quality of financial reporting across the EU member states. The perceived disclosure quality has increased significantly for companies applying internationally recognized accounting standards, particularly IFRS, both statistically and economically. It does not hold only for firms which have voluntarily adopted IFRS or U.S. GAAP, but also for those which mandatorily adopted such standards in response to requirements by the German Stock Exchange for specific market segments.

(Pramanik, 2008) Protecting the environment is the social responsibility and commitment of corporations towards the society. It is believed that corporation is responsible for the environmental crisis and so they should pay for this (cost-benefit trade off). However, reporting is mostly guided by standards, guidelines, etc., and, we do not have any standards designed for such disclosure. So, such reporting is still voluntary that has no specific format and style. Voluntary disclosure generally leads to non-disclosure and mandatory disclosure leads to nominal disclosure. Thus, environmental disclosure should have both type of orientation, as it is a question of life and sustainability. The level, extent, and style of disclosure are not satisfactory at all in any respect. The professionals and respective regulatory authorities should come forward with stricter standards and guidelines to this issue that is the demand of time. (Dhar and Mitra, 2010) reviewed annual reports of 100 companies randomly selected out of BSE 500 index. CSR disclosure items were handpicked from the annual reports and an un-weighted disclosure index was conducted. The study used content analysis and the Overall Corporate Social Responsibility Disclosure Scores were calculated. The study found that there is scope for improvement in corporate social reporting practices in India. Although, a few companies have started to publish separate sustainability or corporate social report, there is lack of objective and informative reporting as demonstrated by this survey. (Firoz , 2010) This research paper made a critical appraisal of the contemporary environmental accounting literature and examined whether IFRS can contribute towards monitoring and protection of environment. The study concluded that the organizations are required to enhance the scope of environmental financial reporting from the present reporting practices as recognition and measurement of environmental benefits, environmental costs, environmental assets, and environmental liabilities.

(Singh & Vasudeva, 2013) This study underpinned the importance of imparting ethical education to Accounting Professionals. The study pointed out at the role of accounting professionals who failed to report or did not report material manipulations in the financial results of the companies who were found scandalous. An association was found between ethical values of accounting professionals and their choices in ethical dilemmas in their profession. Correlation scores in their study revealed that there is a statistically significant low degree of positive correlation between value assessment ratings and ethical dilemmas in scenarios. The study recommended that the Professional bodies should encourage compliance with ethical reporting practices in accounting by both carrot and stick approach.

Singh et al. (1999 and 2000); Singh (2001, 2002 a & b, and 2003); Singh & Rastogi (2001); and Singh & Goel (2001 & 2007) conducted a number of studies on values of professionals. The studies strongly underlined the importance of building up ethical values of professionals.

Financial vs. Non-Financial Reporting

During the initial phases, when business was organized as sole proprietorship or partnership firms, profit was the dominant barometer of the success of business. Subsequently, with the formation of joint stock companies and the development of stock markets, corporate performance was judged by market capitalization, share price and certain financial ratios such as Earnings per Share (EPS), Return on Equity (ROE), etc. Now in the 21st century, corporate performance will be judged by ***corporate social responsibility*** **(CSR)** whose disclosure will fall under **non-financial reporting**. One of the critical parameters to be evaluated in this context would be the value created by the companies for the society and whether such value creation is going to be sustainable. Just as financial reporting is not only concerned with returns but the risk return trade-off, similarly, non-financial reporting is also about the risks that one creates in the society**.** Following picture shows the various forms of NFR.

Figure 1

Sustainability and its Reporting

Sustainable Development is defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Corporate Sustainability is the ability of the

corporates to maintain economic prosperity in the context of environmental responsibility and social stewardship. It is a business approach that creates long-term stakeholder value by embracing opportunities and managing risks deriving from economic, social, and environmental developments.

Sustainability reporting has become more relevant and important in today's context not only from social or environmental concerns, but because, globally, we have come to realize that our goal is not just growth and profits, but we are looking at inclusive growth. And, if the growth process is not equitable, it cannot be sustainable. If inclusive growth has to be a permanent agenda item in our growth process, then it has to be sustainable. Today, many of world's problems have been attributed to the lack of inclusive growth.

Environmental Reporting

Incorporation of environmental issues into the Corporate Annual Report can be labeled as **Environmental Reporting**. It encompasses voluntary and involuntary disclosure of its activities on the environment. Accounting and Disclosure of environmental aspects have been emerging as **an important dimension of reporting practices**.

A concern for the environment is an indispensable part of our business philosophy. In India we do not have any formal guidelines provided by government or industry so in absence of this, enterprises design their own mechanism and follow certain practices for disclosure. All companies should also ensure that their activities do not adversely affect the environment and the laws relating to the environment should be followed in letter and spirit.

Social Reporting

The corporations cannot act as isolated economic entities with indifferent attitude towards the society. It cannot succeed in a society that suffers from social unrest like economic disparity, inequality and social justice. There is a need to ensure that there is no social discontent and there are adequate provisions for health, education, literacy, etc. Thus, the companies should serve the society to return at least some part of what they have gained.

Studies explain that the structure of reporting has changed considerably over the years. Whereas in the 1990s, most reports focused on environmental indicators only, today, reports tend to be more thorough and bring together economic and social as well as environmental data, or triple line reporting. Elkington (1997) coined the term **"triple bottom line"** to describe social, environmental, and financial accounting.

Advantages of Non-Financial Reporting

There are multiple advantages to both report preparers and report readers. **The advantages to the report preparers are:**

- Tool for increased comparability and reduced cost of sustainability
- Brand and reputation enhancement
- Differentiation in the market place
- Protection from brand erosion due to action of suppliers or competitors
- Fosters innovations in order to make processes environment friendly.

Advantages to the report readers are:

- Useful yardstick to compare the performance
- Means of ensuring corporate governance
- Pathway for long-term discourse with reporting organization.

To sum up:

- Corporate that focus on Sustainability Reporting outperforms their peers in the long run and help in consolidating their market position.
- In view of reliable correlation between business integrity and above average financial performance, NFR demonstrates ongoing business integrity and enhances investor and stakeholder confidence.
- Helps to acquire national and international listing and gain access to otherwise restricted markets.
- Helps to attract finance through transparent relationship with credit providers, improve management systems and employee motivation and customer satisfaction.

All business activities have some environmental and social impact that typically results from subpar and inadequate environmental and social practices, including:

- Over-use and wastage of natural resources
- Environmental deterioration caused by continuing polluting activities
- Constant damage caused by previous polluting practices
- Damage caused by accidents and mishaps
- Use of explosives and other environmentally sensitive materials

All these impacts have ramifications to business. The risks that such impacts create can be legal, financial, and reputational, and companies themselves are increasingly accountable for the effects their portfolios have on the environment and society. **The costs that can be incurred by a business operating without regard to environmental and social issues include:**

- Pollution cleanup costs
- Fines
- Increased waste handling costs
- Costs from damaged assets with reduced value
- Legal claims
- Regulatory delays
- Reduced public regard and reduced sales

Integrated reporting: the need of the hour

Integrated reporting i.e., representation of the **financial** and **non-financial** performance of a company in a single report, doesn't only mean merging **financial** and **sustainability** reports into one report, its true meaning is to link sustainability strategy to business strategy and help the company and its stakeholders identify the non-financial priority areas. Integrated Reporting demonstrates the linkages between an organization's strategy, governance, and financial performance and the social, environmental, and economic context within which it operates. By emphasizing these connections, Integrated Reporting can help business to take more sustainable and viable decisions and will empower investors and other stakeholders to discern how an organization is really operating.

Why have one report?

Releasing one integrated report which illustrates the financial as well non-financial performance of a company is beneficial as it can help:

- demonstrate that the company is serious about incorporating sustainability into its core business
- communicate the impact of a company's operations on environment and community and illustrate a company's commitment to mitigating the effects
- correctly identify ESG related risks and opportunities and help provide a competitive edge over its peers in the long term – in several cases, this can help lower the cost of capital
- a company make informed decisions and improve its overall performance
- identify cost savings by analyzing financial and non-financial metrics together
- increase internal collaboration between different departments and create a more streamlined organization
- increase engagement with internal and external stakeholders through consistent and balanced reporting
- address reputational risk as integrated reporting provides a medium to communicate strategy and identify gaps, thus helping build trust amongst stakeholders
- increase brand value and customer loyalty

Global initiatives in Sustainable Reporting (Development of codes and CR index)

A strong corporate reporting infrastructure is the key to improving transparency, fostering investor confidence, facilitating the mobilization of domestic and international financial resources, and promoting financial stability. Over the last decade, a series of international corporate reporting standards and codes have been developed. The increasing pace of globalization and international economic integration has strongly encouraged the application of such standards and codes worldwide.

International Standards of Accounting and Reporting

The **Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR)** was created by the United Nations Economic and Social Council (ECOSOC) in 1982, and is the only intergovernmental expert body focused on corporate transparency and accounting issues. Hosted by United Nations Conference on Trade and Development, ISAR's work covers a range of financial and non-financial corporate reporting issues. Its mission is to support sustainable economic development and financial stability by contributing to improvements in corporate transparency. UNCTAD hosts the annual session of ISAR at the United Nations headquarters in Geneva. Several hundred experts from more than half of UN member States participate in the annual session in Geneva. Participants include: policymakers, regulators, and representatives from academia, civil society, private industry and various national, regional, and international accountancy organizations.

Over the last two years, UNCTAD's Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR) has been working towards developing a guiding tool on capacity-building for high quality corporate reporting. (UNCTAD, 2008)

Corporate Responsibility Index

The Corporate Responsibility Index (CRI) was designed by Business in the Community (BITC). As a unique movement of 700 member companies, BITC's purpose is to inspire, challenge, engage and support business in continually improving its positive impact on society. The idea of an index was first raised in BITC's 2000 *Winning with Integrity* report. Following this report BITC conducted a survey of UK businesses in 2001, *Investing in the Future*, which identified a need for reliable, standardized information that would enable a company's performance to be compared with that of its peers. On 27 September 2010, the 2011 Corporate Responsibility Index was launched by BITC, in cooperation with the Centre, as a Global Index run by BITC directly from the UK for all participating UK, Australian and New Zealand companies. (www.corporporate-responsibility.com.au/)

UK Experience of CRI

The UK experience of the Corporate Responsibility Index has been highly successful, with 122 businesses participating in its first year in 2002, including ninety-three companies

from the FTSE 350 and fifty-three from the FTSE 100. In the second year 139 companies participated, with an 85% retention rate**.**

CRI in Australia

St James Ethics Centre recognized the need in Australia for a voluntary, business-led Index with sound methodology and focusing upon corporate responsibility. The Ethics Centre was introduced to Business in the Community through Jane Tewson from Pilot light Australia (www.pilotlight.org.au).

St James Ethics Centre – CRI

Business in the Community generously agreed to donate the Corporate Responsibility Index under license to St James Ethics Centre to be implemented in Australia with the assistance of *The Sydney Morning Herald* and *The Age*, and supported by Ernst & Young who validated the results until 2008 when PricewaterhouseCoopers took over validation**.**

CRI is expanding

On 27 September 2010, the 2011 Corporate Responsibility Index was launched by BITC, in cooperation with the Centre, as a Global Index run by BITC directly from the UK for all participating UK, Australian, and New Zealand companies.

Key Areas of CRI

The CRI enables companies to assess the extent to which corporate strategy is integrated or translated into responsible practice throughout the organization. The CRI covers the management of four key areas: Community, Environment, Marketplace, and Workplace and finally performance in a range of social and environmental performance and impact areas.

Measurement of CRI

The components of the Index model are weighted as follows:

Section 1: Corporate Strategy – 10% of total score

Section 2: Integration – 22% of total score

Section 3: Management Practice - 26% of total score (includes Community, Environment, Marketplace, and Workplace management sections)

Section 4: Performance and Impact - 36% of total score (includes a choice of Social and Environmental Impact areas)

Section 5: Assurance & Disclosure - 6% of total score

Each management section of Community, Environment, Marketplace, and Workplace is equally weighted, and each of the social and environmental impact areas is also equally weighted.

Global Reporting Initiative (GRI)

The GRI is a network-based organization that pioneered the world's most widely used sustainability reporting framework. GRI is committed to the Framework's continuous improvement and application worldwide. GRI's core goals include the mainstreaming of disclosure on environmental, social, and governance performance. One of the most widely used frameworks for reporting on sustainability is the Global Reporting Initiative's G3 Guidelines. This framework has been used in nearly 7500 reports to report on sustainability worldwide and more than 100 GRI reports have been published by Indian companies so far. Global Reporting Initiative (GRI) is a global initiative to standardize NFR (Non-Financial Reporting) which the institutions adopt and has become the de-facto standard internationally. GRI is a long-term, multi-stakeholder, international process whose mission is to develop and disseminate globally applicable Sustainability Reporting Guidelines. These Guidelines are for voluntary use by organizations for reporting on the economic, social, and environmental dimensions of their activities, products, and services. The aim of the Guidelines is to assist reporting organizations and their stakeholders in articulating and understanding contributions of the reporting organizations to sustainable development. (www.globalreporting.org)

Sustainability Reporting (or Non-Financial Reporting): Indian Scenario

The level of sustainability reporting in India is in its infancy and still evolving. In India, there are various drivers behind the increase in dialogue, discussion, and publication of sustainability reports – drivers that are somewhat different from other parts of the world. For example, pressure from the NGO sector is low in India when compared to other countries. Pressure originates rather from increasing involvement in the global business environment. Many companies issuing CSR corporate communications now actively report on the social dimension as well. For institutions in India one of the primary drivers of their involvement in activities in social and environmental spheres is their **reputation** and **branding.**

There are many reasons for this change in mindset. Foremost is the increasing globalization of business. As more Indian companies expand internationally and acquire interests overseas, demands on transparency from a more "global audience" have put pressure on Indian companies to start reporting on sustainability issues. Within India, there has also been a change in the mindset of stakeholders on matters pertaining to environmental and social responsibility. Recently, government faced public protests and pressure to refuse entry to foreign ships that were brought to India for

decommissioning, as they contained large amounts of asbestos and other harmful substances. While the general public opinion on sustainability issues is still evolving, companies taking the first steps can expect intense public scrutiny, which again highlights the need for transparent reporting on operations. Another significant thrust has been the role of government as a stakeholder. India has stringent laws on labor, environment, health, and safety. Over the past few years the government has become increasingly proactive in addressing enforcement. Intense media attention and scrutiny on corporate social responsibility has also forced the companies to take more cognition of their activities and engagement with stakeholders.

Reporting standards

While currently there are no officially recognized guidelines or reporting standards on sustainability reporting (by accounting or regulatory bodies) in India , there has been an increasing trend amongst companies to publish a variety of information relating to themes such as community, corporate social responsibility, environment, health, and safety. Indian companies, therefore, present diversity in content and format under the overall umbrella of sustainability reporting. Traditionally, while many organizations both in the public and private sector practice some sort of corporate social responsibility programmers, reporting has not been a common practice. A survey conducted in 2003 by "Partners in Change" showed that 70 per cent of the participating companies do not have a CSR policy, but are nevertheless doing "good work". However, over the past few years, there has been an increasing awareness and activity in the CSR field and many companies have started some reporting on sustainability issues, albeit in limited and diverse formats.

Many organizations in India have certified environmental management systems, based on ISO 14001. Consequently, data on environmental indicators are more readily available and many companies have started reporting by issuing environmental reports which also include health and safety data. It is only after this initial phase that companies in general started developing reporting formats that conform to the GRI Guidelines. In accordance with global trends, some Indian companies have also started seeking independent assurance on their sustainability reports.

Reporting under environmental legislation in India

One of the fundamental features of India's ancient philosophy has always been respect for the environment. The Indian Constitution is amongst the few in the world that contains specific provisions on environmental protection. State policy principles explicitly enunciate the national commitment to protect and improve the environment. The national environmental policy framework is the responsibility of the Ministry of Environment and Forests. Implementation is undertaken by the Central Pollution Control Board (CPCB) and the State Pollution Control Board (SPCB) at the Central and state levels respectively. The Department of Environment at the Central level supports the SPCBs. The Environment (Protection) Act of 1986, considered as the "Umbrella Act", was formulated for the protection and improvement of the quality of the environment and prevention, control, and abatement of environmental pollution. The Act is also an "enabling" law, which articulates the essential legislative policy on environmental protection and delegates wide powers to competent authorities to frame necessary rules and regulations.

- In terms of this Act, each covered organization should submit an annual "environmental audit report" (in a prescribed format) to the relevant SPCB.
- Reporting in the environmental statement includes parameters such as water and raw material consumption, pollution generated (along with variations from prescribed standards), quantities and characteristics of hazardous and solid wastes, impact of pollution control measures on conservation of natural resources and on cost of production, and additional investment proposals for environmental protection. At this stage, the statement is not required to be audited. The legal requirement on its preparation and submission helps ensure that data on environmental measures is collated, categorized, and analyzed by all businesses covered under the legislation. Many organizations in India have started to audit these statements internally with a view to improving their environmental performance and as a matter of good practice.

Reporting under the Companies Act in India

The Companies Act in India governs the overall regulation of companies in India and includes sections on disclosure and reporting on various aspects of company operations. Section 134 of the New Companies Act 2013, stipulates that the Board of Directors' Report (attached to every balance-sheet tabled at a company annual general meeting) shall contain information on conservation of energy. The latter is expected to include:

- Energy conservation measures taken;
- Additional investments and proposals, if any, being implemented for reduction of the consumption of energy;
- Impact of the measures taken above for reduction of energy consumption and consequent impact on the cost of production of goods; and
- Total energy consumption and energy consumption per unit of production in respect of specified industries.

Reporting on social matters

Traditionally, there has been a very thin line of demarcation between **socially aware entrepreneurship** and **philanthropy.** Businesses today are becoming more aware

of the business case that social responsibility is not limited to acts of charity and that it requires internalization and systemic expression. In 1980, Tata Steel released a "Report of the Social Audit Committee" which explored whether the company had fulfilled the objective contained in the Articles of Association regarding its social and moral responsibilities to consumers, employees, shareholders, the local community, and society. Since then, there has been a growth and consistent improvements in the quality of reporting of Indian companies. Sustainability reporting in India often starts as a voluntary initiative amidst limited pressure from local NGOs/civic society to publish sustainability reports. Reports are often produced and used for internal purposes. The GRI has been working with the Confederation of Indian Industry (CII) for a better understanding of the Indian context of reporting and ways of applying the international framework standard domestically.

Objectives

Following are the objectives of the study:

- ***The purpose of this research is to find out the practices of accounting and reporting in India.***
- ***What has been the shift in Reporting Practices by Indian companies?***
- ***What drives the Indian companies to report on the non-financial matters?***
- ***This paper mainly focuses on the inclusion of Non-Financial Matters in the Corporate Annual Reports. This paper also compares the views of Academicians and accounting professionals on the ethical reporting practices of the Indian companies.***
- ***The purpose of this study is to determine the extent to which Corporate Annual Reports "CARs", serve the information needs of the users and how far it succeeds in disseminating company's concern about the environmental and social aspects and the efforts made by it in the same directions.***
- ***To see if there is any difference in the opinions of Users of "CARs" and preparers of them with regard to the use of XBRL, motives behind CSD practices, relevance of sustainability reporting etc.***
- ***To study the development of international corporate reporting standards and codes and the Indian scenario.***

Research Methodology

This research is based on primary as well as secondary data. An Empirical Survey was carried out and the structured questionnaires were administered to the participants of survey. Two set of questionnaires were prepared, one for academicians and the other one for accounting professionals. All the respondents in Academician category were from Delhi University. Total 75 academicians from the various colleges (SRCC, Hans Raj College, Hindu College, Shaheed Bhagat Singh College), and Department of Commerce, Delhi School of Economics responded to the questionnaires. In the Accounting Professionals category a total of 47 Chartered Accountants from various firms of Delhi (Ernst & Young, KPMG, Luthra & Luthra, Deloitte India, Interfreight Uganda limited) responded to the questionnaires. The total sample size of usable questionnaires was 122.

Judgmental sampling design has been used to identify the individuals who have the required information. Only those who had sound knowledge of Accounting and Annual Reports were chosen for participating in survey. To frame the questions, Annual Reports of BSE SENSEX companies as reported on 06 May 2011 were downloaded and content analysis was conducted on these reports to derive content related information. Most recent reports available that dealt with environmental and/or social issues, health and safety, corporate responsibility, sustainability, social or similar types of CSR related information were collected and made an inter-firm & intra-firm comparison of contents of these reports. These were mostly stand-alone reports published adjacent to the annual financial report. However, there were some firms that had no separate CSR report but a financial report that contained a substantial section on CSR, which were analyzed. Only reports that covered 2009/2010 or later were included. To get the reports websites of the respective companies were browsed. The questions were framed in such a way as to get the maximum idea of the perception of the experts with regard to inclusion of non-financial items in reports and the credibility of corporate annual reports. A 5 point Likert scale has been used to elicit the opinion of respondents about the questions. 1. Strongly Disagree (SD) 2. Disagree (D) 3. Unsure (U) 4. Agree (A) 5. Strongly Agree (SA). The responses given by Academicians were compared with the responses of Accounting Professionals (CAs) using MS Excel, and the difference in their mean score has been tested using the **t-test** analysis after testing normality of distribution and homogeneity of variances. Common statements of the two questionnaires with their mean, median, standard deviation and frequency percentage are shown in table 4 and 5.

Hypotheses

The scores of the two sets of respondents were tested against the following three hypotheses:

HO1: There is no significant difference of opinion between Chartered Accountants and Academicians with regard to making mandatory, "the public disclosure of environmental effects of processes within the organizations". *[Null hypothesis 1]*

HA1: There is a significant difference of opinion between Chartered Accountants and Academicians with regard to making mandatory, "the public disclosure of environmental effects of processes within the organizations". *[Alternate hypothesis1]***HO2:** There is no significant difference of

opinion between Chartered Accountants and Academicians "that public disclosure of company information could lead to a decrease in corrupt practices and may enhance transparency".

[Null hypothesis 2]

HA2: There is a significant difference of opinion between Chartered Accountants and Academicians "that public disclosure of company information could lead to a decrease in corrupt practices and may enhance transparency". *[Alternate hypothesis2]*

HO3: There is no significant difference of opinion between Chartered Accountants and Academicians about "the usefulness of financial reporting in digital form making use of eXtensible Business Reporting Language (XBRL)". *[Null hypothesis 3]*

HA3: There is a significant difference of opinion between Chartered Accountants and Academicians about "the usefulness of financial reporting in digital form making use of eXtensible Business Reporting Language (XBRL)". *[Alternate hypothesis 3]*

These hypotheses have been tested using t-test as data distribution was found to be normal.

Analysis and findings

The following are the results as shown in Table 1 which have been used for testing **Hypothesis 1 (HO1).**

Table 1

Making mandatory the public disclosure of environmental effects of processes within the organizations t-Test:	
	Academicians' view
Mean	4.573
Variance	0.2749
Observations	75
Pooled Variance	0.4833
Hypothesized Mean Difference	0
Df	120
t Stat	5.09
P(T<=t) one-tail	0.00
t Critical one-tail	1.65
P(T<=t) two-tail	0.00
t Critical two-tail	1.979

As from the above result, it can be seen p value is less than 0.05, we reject our null hypothesis. Hence, there is a significant difference of opinion between Chartered Accountants and Academicians with regard to making mandatory, "the public disclosure of environmental effects of processes within the organizations". Academicians are more inclined to make the environmental disclosure mandatory. (Mean score 4.573).

The following are the results which have been used for testing **Hypothesis 2 (HO2).**

Table 2

The public disclosure of company information could lead to a decrease in corrupt practices and may enhance transparency. t-Test:	
	Academicians' view
Mean	4.013
Variance	0.4457
Observations	75
Pooled Variance	0.599
Hypothesized Mean Difference	0
Df	120
t Stat	0.240
P(T<=t) one-tail	0.405
t Critical one-tail	1.657
P(T<=t) two-tail	0.810
t Critical two-tail	1.9799

As from the above result, it can be seen that P value is more than 0.05, so our null hypothesis is not rejected. Hence, there is no significant difference of opinion between Chartered Accountants and Academicians with regard to "public disclosure of company information that it could lead to a decrease in corrupt practices and may enhance transparency". They both have agreed (Mean value apprx. 4) on this statement.

The following are the results which have been used for testing **Hypothesis 3 (HO3).**

Table 3

Usefulness of financial reporting in digital form making use of eXtensible Business Reporting Language (XBRL) t-Test:	
	Academicians 'view
Mean	3.853
Variance	0.5863
Observations	75
Pooled Variance	0.6732
Hypothesized Mean Difference	0
Df	120
t Stat	0.8511
P(T<=t) one-tail	0.1981
t Critical one-tail	1.6576
P(T<=t) two-tail	0.3963
t Critical two-tail	1.9799

As from the above result, it can be seen that P value is more than 0.05, so our null hypothesis is not rejected. Hence, there is no significant difference of opinion between Chartered

Accountants and Academicians with regard to "the usefulness of XBRL in financial reporting". They both have agreed on the role of XBRL.

The following table 4 shows the mean, median, standard deviation of the responses.

Table 4

Statements of the Questionnaire	N Valid	Mean	Median	Std. Deviation
CAR is the primary communication channel	122	4.04	4	0.75
Sustainable Development – not relevant in India	122	2	2	0.98
Report on Carbon emission, energy use, etc. to be made mandatory	122	4.31	4	0.76
Meaning of Social Reporting	122	3.82	4	0.77
Sustainable Report Disclosure-Favorable &Unfavorable results	122	4.21	4	0.65
Ind-AS Rule based or principle based	122	3.09	3	0.87
Use of XBRL in financial reporting	122	3.80	4	0.81
Is meeting clause 49 requirements enough to show "All is Well".	122	3.01	3	1.09
Quality of disclosure in CARs lowers risk premiums.	122	3.36	3	0.86
Additional disclosure requirements just wastage of time and human effort	122	2.26	2	0.95
Global competition has shaped CSD practice.	122	3.65	4	0.73
CARs mainly talk about: Human Resource Activity	122	3.06	3	0.92
CARs mainly talk about: Community Development Activity	122	3.10	3	1.018
CARs mainly talk about: Product and Service Activities	122	3.78	4	0.78
CARs mainly talk about: Environmental Activities of the Organization	122	3.11	3	1.053
More info on environmental activities could add value to the firm	122	4.10	4	0.85
Mandatory disclosure leads to an increase in ethical practices	122	4	4	0.77
Reputation building, the primary motivating factor for companies to go on CSD path	122	3.77	4	0.81
Most CAR's give a window dressing of their image. Highlight positives and hide negatives	122	3.54	4	1.09

Table 5 depicts the frequency of the Likert scale parameters.

Interpretations

The above table shows that most (91%) of the respondents regard the Corporate Annual Reports (CARs) as the primary communication channel. 61% of the respondents have disagreed to the statement that additional disclosure requirements is just wastage of time and human effort, while 23% have strongly disagreed to it. This indicates that disclosure in CARs is the need of the hour. 57% respondents have agreed and 31% have strongly agreed to the statement that more information on environmental activities in CARs could add value to the firm. 57% respondents have agreed and 32% have strongly agreed that **more information on environmental activities could add value to the firm**. Thus it can be concluded that disclosure in the Corporate Annual Reports **increase** the **credibility** of companies and is desirable from society's viewpoint. 49% of the respondents have agreed and 24% have strongly agreed to the statement that "Most CAR's give a window dressing of their image. Highlight positives and hide negatives". So this can be concluded that there is requirement of a proper code on the disclosure of non-financial aspects, which the companies should adhere to.

Conclusions

Governance and transparency are more critical to foreign investors because they don't have the wherewithal to check a company. One of the root causes of the global economic crisis was a lack of transparency, investor greed and poor corporate performance. How companies report, how they tell us about the risk in their company (both financial and non-financial) is the solution.

Professional bodies should encourage ethical reporting and prevent the causes of unethical reporting by various means. Regulatory authorities must put in place effective arrangements for efficient monitoring of regulatory compliance. If the law becomes more punitive for defaulters, it might act as a deterrent to unethical reporting practices. But unless we raise the consciousness level of people in general, we would continue to witness unethical practices. Hence each dimension needs to be tightened and above all moral conscience need to be evolved more amongst people. (Singh & Vasudeva, 2013)

The main challenges for non-financial reporting in India are the following:

- Lack of a specific sustainability/CSR reporting legislation or guidelines;
- Companies find it challenging to report how they conduct business in the absence of clear guidance based on local conditions.
- Following early experimentation, efforts need to be focused and reporting standardized. Typically, companies tend to report their community initiatives on a few pages in their Annual Reports rather than providing detailed information on internal practices and issues such as transparency, risk, and social or environmental impacts; and
- Synergizing social and business interests needs top priority. Corporate philanthropy needs to transform into the realm of core business and corporate social responsibility.

Table 5

Statements of the Questionnaire		D	SD	U	A	SA	Total
CAR is the primary communication channel	Frequency	1	8	2	85	26	122
	Percent	0.819	6.55	1.639	69.67	21.31	100
Sustainable Development- not relevant in India	Frequency	41	55	14	9	3	122
	Percent	33.60	45.08	11.47	7.37	2.459	100
Report on Carbon emission, energy use, etc. to be made mandatory	Frequency	0	3	13	48	58	122
	Percent	0	2.459	10.65	39.34	47.54	100
Meaning of Social Reporting	Frequency	2	5	22	76	17	122
	Percent	1.63	4.098	18.03	62.29	13.93	100
Sustainable Report Disclosure- Favorable &Unfavorable results	Frequency	2	0	4	80	36	122
	Percent	1.639	0	3.27	65.57	29.50	100
Ind-AS Rule based or principle based	Frequency	4	20	68	21	9	122
	Percent	3.278	16.39	55.73	17.21	7.37	100
Use of XBRL in financial reporting	Frequency	1	4	37	56	24	122
	Percent	0.819	3.27	30.32	45.90	19.67	100
Is meeting clause 49 requirements enough to show "All is Well".	Frequency	9	37	27	41	8	122
	Percent	7.37	30.32	22.13	33.60	6.55	100
Quality of disclosure in CARs lowers risk premiums.	Frequency	3	13	51	46	9	122
	Percent	2.459	10.65	41.80	37.70	7.37	100
Additional disclosure requirements just wastage of time and human effort	Frequency	23	61	24	11	3	122
	Percent	18.85	50	19.67	9.01	2.45	100
Global competition has shaped CSD practice.	Frequency	1	9	28	77	7	122
	Percent	0.81	7.37	22.95	63.11	5.73	100
CARs mainly talk about: Human Resource Activity	Frequency	3	34	42	38	5	122
	Percent	2.459	27.86	34.42	31.14	4.098	100
CARs mainly talk about: Community Development Activity	Frequency	5	33	37	38	9	122
	Percent	4.09	27.04	30.32	31.14	7.37	100
CARs mainly talk about: Product and Service Activities	Frequency		12	17	78	15	122
	Percent		9.83	13.93	63.93	12.29	100
CARs mainly talk about: Environmental Activities of the Organization	Frequency	4	39	28	41	10	122
	Percent	3.27	31.96	22.95	33.60	8.19	100
More info on environmental activities could add value to the firm	Frequency	2	7	5	70	38	122
	Percent	1.639	5.73	4.09	57.37	31.14	100
Mandatory disclosure leads to an increase in ethical practices	Frequency	1	3	21	67	30	122
	Percent	0.819	2.459	17.21	54.91	24.59	100
Reputation building, the primary motivating factor for companies to go on CSD path	Frequency	1	10	21	73	17	122
	Percent	0.819	8.196	17.21	59.83	13.93	100
Most CAR's give a window dressing of their image. Highlight positives and hide negatives	Frequency	4	22	23	49	24	122
	Percent	3.27	18.03	18.85	40.16	19.67	100

It is believed that corporation is responsible for the environmental crisis and so they should pay for this (cost-benefit trade off). However, reporting is mostly guided by standards, guidelines, etc., and, we do not have any standards designed for such disclosure. So, such reporting is still voluntary that has no specific format and style. Voluntary disclosure often leads to non-disclosure and mandatory disclosure leads to minimal disclosure. Thus, environmental disclosure should have both type of orientation, as it is a question of life and sustainability.

Recommendations

- The Corporate Annual Reports are still regarded as the primary communication channel between company and the various stakeholders despite the various other sources of information. It has been found that there is no significant difference of opinion between Chartered Accountants and Academicians with regard to "public disclosure of company information that it could lead to a decrease in corrupt practices and may enhance transparency". They

both have agreed (Mean value appx. 4) on this statement. Hence public disclosure of company information both financial and non-financial must be enhanced.

- Academicians are more inclined with regard to making mandatory, "the public disclosure of environmental effects of processes within the organizations". (Mean score 4.573). Hence as per Academicians environmental disclosure must be made mandatory.
- It has been found that there is no significant difference of opinion between Chartered Accountants and Academicians with regard to "the usefulness of XBRL in financial reporting". They both have agreed on the role of XBRL, hence XBRL should be used in financial reporting.
- Reporting on ESG matters could increase value of firm and reduce the gap between the economic objectives and social objectives of the companies, as reporting on these matters tend to reduce the cost of capital.
- More than 80% of the G250 Fortune Global companies now report on corporate responsibility. In India only 16 companies reported on sustainability in 2007 (KPMG Global Sustainability services, 2008). It is important that such initiatives are encouraged through stakeholder awareness and response.
- It is through this learning and change process that the organizations start to measure, report, and improve on the way they make decisions and take actions. And by doing so, they create sustainable value for the organizations and its stakeholders. There appears to be global interest in the subject as reporting not only makes all stakeholders aware of the environmental performance of the company but gives a food for thought and plan for further action to the company itself.
- Further, availability of sufficient data alone can establish relationship between economic and environmental performance. In developing country like India, such study is all the more essential as it will make the politicians, economists, technologists, sociologists, and the company managers aware about the limitations of growth as also the suitable course of growth without damaging the environment. 'Green' products, for example, not only reduce waste and cost to provide direct savings, but also provide reputational dividends from both investors and consumers. That said the 'green' label may soon wear itself out as environmentally friendly products become the norm rather than the exception. (KPMG, 2011)
- Creating a databank and benchmarking of environmental performance will increase the competitiveness to the advantage of customers as well as society at large. **It should also pave the way for amendment of the Company and Environmental laws and regulations** and enable national stock exchanges to create new indexes in line with Dow Jones Sustainability index to the advantage of the investors and shareholders.
- To motivate the companies for meaningful environmental reporting, **rewards for good quality of environmental reporting** should be instituted similar to the rewards for good environmental performance. Environmental legislation, perhaps, is adequate. What is needed is its enforcement.
- Integrated reporting could pave the way for synthesizing financial and non-financial reporting into one form and give a holistic view of companies' strategies to its stakeholders incorporating new dimensions of IFRS.

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THE STATISTICAL ANALYSIS FOR THE THEORETICAL BIO-METHANE MARKET BASED ON THE OPINION OF CAR-OWNERS OF HAJDÚ-BIHAR COUNTY IN HUNGARY

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Abstract: The more expensive fuels and the health-threatening air pollution make even necessary the spread of such a fuel, which serves as a solution to these problems. In our country at present there are three public CNG filling stations, two of them are located in Győr and Szeged and the third one was opened at the end of October in Budapest. The lack of infrastructure obstructs the spread of the methane gas powered cars in Hungary. During my research getting information by means of a test questionnaire I measured the fuel selection of the drivers and their opinion about alternative fuels. Then on the basis of the results I determined the potential target audience of the bio-CNG. As it is also typical in our country, the most of the respondents use gasoline-powered vehicle and drive less than 12 000 km/year on an average. 55% of the respondents would have their car converted in order to refuel cheaper and to protect the environment, consequently there would be demand for CNG. The potential target audience is the urban population below the age of 41 with higher education degree and average salary. One of my future objectives is to design a CNG filling station network in Hajdú-Bihar county considering the demand of car owners.

Key words: biomethane, CNG, potential demand

1. Introduction

Besides more expensive fuel prices and health-threatening air pollution, which are typical today, the spread of such an alternative fuel, that can remedy these problems, becomes more and more important.

Incineration of fossil fuels contributes to the global CO2 emission by 90% (Edgar, 2011). In 2011 global CO2 emission increased by 3%, which was the greatest value ever, since it reached 34 billion tonnes (Jos et. al, 2012). The air quality is polluted to the greatest extent by gasoline with 190 g/km CO2 emission; it is followed by diesel with 160 g/km, while the emission of CNG-powered cars is 120 g/km (Engerer and Horn, 2011).

Natural gas is a fossil fuel formed when layers of buried plants and animals are exposed to intense heat and pressure over thousands of years. The energy that the plants originally obtained from the sun is stored in the form of carbon in natural gas. Natural gas is a nonrenewable resource because it cannot be replenished on a human time frame. Natural gas is found in deep underground rock formations or associated with other hydrocarbon reservoirs in coal beds and as methane clathrates. Petroleum is also another resource found in proximity to and with natural gas. Most natural gas was created over time by two mechanisms: biogenic and thermogenic. Biogenic gas is created by methanogenic organisms in marshes, bogs, landfills, and shallow sediments. Deeper in the earth, at greater temperature and pressure, thermogenic gas is created from buried organic material. Natural gas can be used to fuel almost any kind of vehicle – motorcycles and three wheelers, cars, vans & pickups, lift trucks, buses, trucks, trains, boats, even aircraft. The availability of vehicles or conversion equipment varies greatly from country to country depending on local conditions. (NVG, 2012)

The conventional method of natural gas distribution would require fuel to be transported via pipelines but the compression of natural gas allows CNG to be carried through pressure vessels instead. CNG being one of the two forms of natural gases (the other being Liquefied Natural Gas which is used mostly for heavy duty vehicles and fleet) and is becoming the alternative energy to fuel cars, buses, pick-up trucks and other vehicles. CNG is safe and clean, non-toxic and non-corrosive. It is also tasteless, colorless and odorless. (ANGA, 2010)

The major difference between CNG fueling and conventional liquid fueling of vehicles stems from variances in physical properties between gases and liquids. Conventional fuel retailers, fleet fueling operators, and drivers are accustomed to fueling vehicles with liquid fuels. Natural gas is similarly simple to use, though different from conventional fueling. While liquid fuels such as gasoline or diesel must be transported to stations via over-the-road trucks, CNG is made from natural gas that is typically transported to the station via

an underground pipeline and then compressed. CNG fueling stations can be designed to accommodate any size vehicle and fuel demand. (ANGA, 2010)

Natural gas is a widely used, relatively clean and freely available fuel. According to Darley (2005) it is the second most important energy source following oil. Cars with duel fuel system emit about 10-15% less greenhouse gases (carbon-dioxide, methane) in comparison with gasoline-powered vehicles. Compared to the gasoline-powered vehicles they have 50-60% less nitrogen-oxides emission as well, moreover the quantity of atmospheric sulphur-oxides and carbon deposit is practically zero. The emission of only CNG-fuelled engines is even lower than that (Dudás, 2011). According to Domanovszky statement the easing of traffic regulations could be very helpful in the spread of gas-propelled cars, not to mention the high prices of gasoline and diesel, besides the biogas is much more cleaner and cheaper as a result the CNG could be an alternative solution for the issue.

Worldwide, there were 14.8 million natural gas vehicles by 2011, led by Iran with 2.86 million, Pakistan (2.85 million), Argentina (2.07 million), Brazil (1.70 million), and India (1.10 million). The Asia-Pacific region leads the world with 6.8 million NGVs, followed by Latin America with 4.2 million vehicles. In the Latin American region almost 90% of NGVs have bi-fuel engines, allowing these vehicles to run on either gasoline or CNG. In Pakistan, almost every vehicle converted to (or manufactured for) alternative fuel use typically retains the capability to run on ordinary gasoline. (NGV,2012)

In 2011 altogether 1 014 170 natural gas-powered cars were on record in the Member States of the EU-24, which were served by 2 805 filling stations. As regards the proportion of the Member States Germany (9.4%), Italy (7.6%), Bulgaria (6.0%) and Sweden (4.0%) rise above the others, while Hungary has only 0.03% share. In respect of the number of filling stations the ratio of CNG stations is the following: Germany (32%), Italy (30%), Sweden (6%) and Austria (7%) (Boisen, 2012). CNG can technically be used in any car engine, though ideal applications are vehicles that can do higher than average mileage. Vehicles that only travel low mileage can be used, but it may take longer to recover the cost of conversion or the premium on a new CNG vehicle through fuel cost savings.

There is some kind of shift in consumption from gasoline to diesel. The 2.2 million m^3 CNG use can not be detected in percentages, with this result Hungary is significantly behind the other member states of the European Union. Today Europe uses 10 billion m^3CNG for propelling vehicles, about five thousand times as much as Hungary. CNG has spread to Europe for several reasons, one reason that the use of it causes significantly less emission, which makes the urban environment more liveable. In addition the 5 decibel lower noise level is also an important positive aspect in case of CNG use. Ou et al found that compressed NG (CNG) and liquefied NG (LNG) fuels can save about 10% of carbon as compared to gasoline vehicles.

When Pakistan first started promoting compressed natural gas to the nation's motorists in the 1990s, the alternative to petrol seemed like a wonder fuel. Getting motorists to convert their cars to run on cleaner, cheaper gas would cure urban pollution and lower demand for the imported oil that was gobbling the country's foreign currency reserves. Car owners loved it and today 80% of all cars in Pakistan run off compressed natural gas (CNG), according to the Natural and Bio Gas Vehicle Association (NGVA), a European lobby group. Only Iran has more gas cars running on the road. (Boone, 2013)

Biogas, from which such huge potentials are available that it could cover one quarter of our traffic's fuel demand, can be made the most suitable renewable propellant. Of course even if there is CNG consumption (Dudás, 2011).

2. Materials and methods

The analysis of the demand for CNG was carried out by primary data collection, which was completed by quantitative method. Getting information by means of questionnaire was the method of my analysis, which was carried out in October 2011. Prior to the actual survey I carried out test questioning in order to form accurate and unambiguous questions and to put the appropriate variations of answers into the final questionnaire.

This survey is based on a test questionnaire in order that the final questionnaire could include appropriate and unambiguous questions and adequate variations of answers. Among the 22 questions of the questionnaire there were closed, open, scaling and segmenting questions. With the help of segmentation questions closed and scaling questions were studied through several segments by significance testing. Cross-table is such a statistical technique, which describes simultaneously two or more variables with such a table, that demonstrates the joint distribution of two or more limited number, categorized variables or variables taking up values (Malhotra, 2002).

With the help of cross-table I analysed the correlation between two nominal, ordinal and categorized metric variables (Sajtos and Mitev, 2007). The questionnaire has several parts, in the first part I ask the fuel consumption habit of the respondent, the following part includes the respondent's opinion about alternative fuels and the third part measures the inclination to convert the vehicle and provides information about how much people could spend money on converting their cars. The last part includes the personal questions, on the basis of which I segmented the answers to the questions. Altogether 110 car owners filled out the questionnaire, from which 104 pieces were appreciable. As regards the number of samples according to the data of KSH (2010) there are 371 cars per 1000 residents on an average in the North Great Plain Region, thus on the basis of number of persons there are 549 785 cars in the region. In view of a national survey in case of 1 million persons 1000 completed questionnaire can be considered representative, so proportionately in the case of this study 55 completed questionnaires could be sufficient at regional level.

The evaluation of the questionnaires was carried out by SPSS 17.0 statistical programme and Microsoft Excel, within which I primarily applied descriptive and mathematical statistics. With descriptive statistical calculations I examined the mean, the standard deviation and the distribution of the answers to the questions.

In the course of high-level statistical procedure I carried out non-parametric statistical calculations (Pearson chi-square test). During the significance analysis p=5% probability level was allowed. In order to complete the significance analysis, the respondents of the questionnaire survey were divided into groups in accordance with different aspects. For this I applied the relevant segmenting questions of the questionnaire – gender, age, educational level, settlement type and income – as a grouping criterion.

3. Results and discussion

3.1. Fuel consumption habits

The 65% of the motorists surveyed use gasoline-powered car, this rate is 13% less than the 2010 real HCSO [1]data. The aforementioned data proves that in our country significant part of those who travel by car use gasoline-powered vehicle, which in my later researches will be important information because of the conversion costs.

Considering the number of annually travelled kilometres, 44% of the drivers travel less than 12 000 km/year, and besides 24% of them go more than 20 000 km/year. This difference can arise from the fact that those who travel over 20 000 km usually use company car, thus they have to drive as a result of their work.

Set out from the actual high fuel prices I asked if people are satisfied with the actual prices or if they are not how much they would pay for fuel. 100% of the respondents are not satisfied with the every day higher prices and they would consider acceptable the 200-250 HUF/liter price. Many people might be wondering why the respondents selected the above-mentioned sum, why not they want to pay 50 HUF for a liter fuel. This is the reason why I classified the fuel prices of the recent years and surprisingly the majority did not choose the cheapest category. It can arise from the fact that people try to think in a realistic way and do not live in a dream world.

3.2. Opinions about alternative fuels

Only 16% of the respondents have already heard about CNG as a fuel, however, only 17% of them have not seen a single environment-friendly car yet.

I did not want to influence the respondents' opinion in any kind of way, thus everybody had the opportunity to say or not to say their opinion. For this reason 54% of the surveyed gave even an indifferent answer to my question. 84% of the respondents have positive, 10% of them have indifferent and 3% of them have negative opinion.

[1]Hungarian Central Statistical Office

Among the positive opinions I read several times the word environmental-friendly and low maintenance cost; while the negative opinions usually reflected that CNG can not spread easily due to the high investment cost, the oil lobby and the lack of knowledge about it. Of course the lack of infrastructure does also not facilitate the choice of the drivers, so this existing situation makes the environmentally conscious and cheap driving more difficult in Hungary.

3.2. Inclination to conversion

On the basis of the *Figure 1*., it can be concluded that the greater part of the surveyed show an inclination toward conversion for refuelling cheaper, while the smaller part of them would not have their cars converted. This is due to the fact that people are irresolute and they have only inconsiderable information about CNG, since 84% of the respondents have not heard about it yet. I examined if the answers received are dependent on the age, gender and educational level of the respondents, but there is no significant connection between either of them.

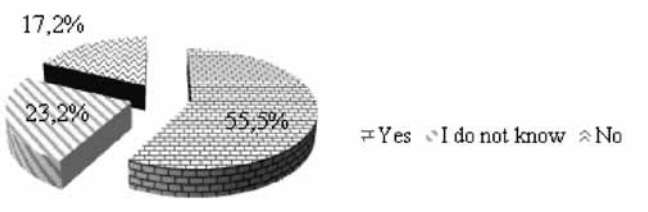

Figure 1: The distribution of conversion
Source: Own survey (2011)

Conversion is influenced by several factors: it depends on the existing knowledge, the infrastructure and the financial condition of the person. Currently the average conversion cost of a gasoline-powered car is 150 thousand HUF. Consequently I made inquiries concerning how much the respondent could and want to spend on conversion.

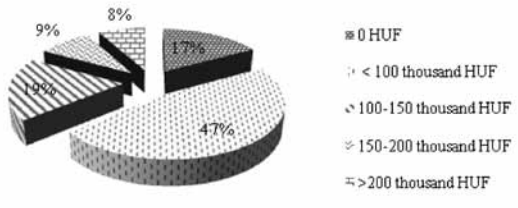

Figure 2: The distribution of the assumed conversion costs
Source: Own survey (2011)

The above-mentioned figure demonstrates the sum respondents would tend to spend on having their cars converted. 47% of them would assign a sum below 100 thousand HUF to this, while 17% of them would not spend money on it at all. On the basis of significance analysis there was no significance result by p=0.687 probability level examined by Pearson chi-square test; therefore the assumption, that people with higher income would spend more money on conversion, can not be proved.

The following figure segments the respondents on the score of educational level regarding the question of conversion.

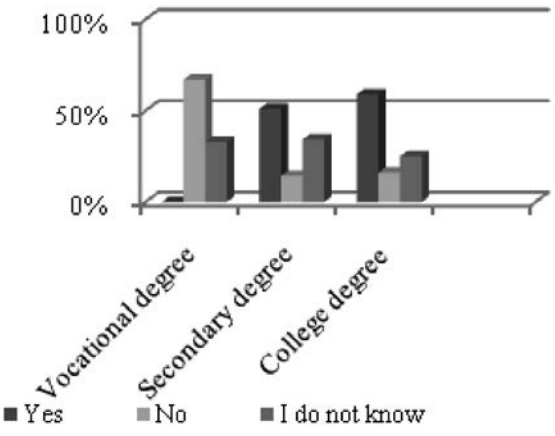

Figure 3: **Distribution of conversion by educational level**
Source: Own survey (2011)

As regards the educational level it can be seen that people with higher educational level present a greater proportion among those who would have their cars converted. It can be due to their broader scope of knowledge in the topic and it is strengthened by the fact that the uncertainty, i.e. the rate of "I do not know" answers, is the smallest in this group.

Considering the age of those who tend to convert their cars the rate of people aged below 41 was the determining, it was almost 90%. This ratio is not surprising, since we can even experience it in our own environment, that the elders insist on their old, accustomed routine and for them it is hard to open up new things whether it is a good one. As regards income categories we can consider that people with higher income have higher inclination to have their cars converted than people in lower-income category. This tendency can not be observed among my respondents. The greatest part of those who tend to conversion (41.7%) earn 100-150 thousand HUF/ month, while only 24% would have their cars converted from those who classified themselves in the high-income category. The reason for this could be that respondents who come under the category of higher salary do not have to spare on money and find alternatives in order to decrease their expenditures even by fuel.

Taking the city structure into consideration citizens are more prepared to have their cars converted than those who live in the country.

Summary

To sum up it can be concluded that on the basis of my questionnaire I found the target audience of biomethane, they are the urban population below the age of 41, with higher education degree and average salary.

My hypothesis, whereas car owners would be ready to have their cars converted into CNG-powered in order to refuel cheaper, was proved.

In my view advertisings and various presentations could help with familiarise people with this alternative fuel so that more people learn about its benefits; in this way demand for CNG could increase. CNG motoring should be available for everyone, the first step in this process is not the construction of a filling station network, but to make people aware of this alternative fuel. At present in the three filling stations people can refuel methane free of excise duty, but the question is what will happen later, when the demand for it increases. There are concerns that the government will not support it, because it does not produce revenue. Exemption from excise duty should be granted for cheaper and environmental-friendly CNGs by state aid, which also could support their spread. CNG is to become widely accepted and the market for fueling infrastructure is to grow beyond these high fuel use fleets, accommodating a variety of vehicle classes and fueling needs, and ultimately connecting fueling infrastructure between cities, counties, regions, and states, retail and truck stop outlets need to be developed in numbers that allow reasonably convenient access to CNG.

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GROWTH AND VENTURE CAPITAL INVESTMENT POTENTIAL FOR UNIVERSITY SPIN-OFFS IN HUNGARY

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Abstract: Venture backed spin-offs represent a low proportion of companies, even of innovative companies. The research question was, whether these companies have an important role in innovation and economic growth. I present the most important indicators of innovation in connection with entrepreneurship, the measures of start-ups, mainly the high-tech ones. I describe the position of venture capital industry nowadays, detailing the classical venture capital investments, targeting high-growth potential small firms, even university spin-offs.

The study presents the results of a survey made as a counterpart of an academic research team, examining spin-offs, entrepreneurs and technology transfer in the most important Hungarian universities.

I found that the most important obstacles of venture capital investments in high-tech spin-offs are the information gap between demand and supply side, the lack of entrepreneurs' willingness to give up freedom in decision making, despite of low managerial skills. The low quality of financial environment is also an obstacle of the segment.

Key words: venture capital, spin-off
JEL classification codes: G24, M13

The global financial and economic crisis has increased attention on entrepreneurship as an important source of innovation and economic growth. By the process of innovation ideas are generated and commercialized. University technology transfer utilizing state-financed research is a possible form of commercializing innovations. Spin-offs with high growth potential can mean possible targets of venture capital, so in this way venture capital backed spin-offs can be a potential source of economic growth.

The university spin-offs have two basic forms: selling patented intellectual property of research results or founding a spin-off company based on patents (Lengyel, 2012). Spin-offs with high growth potential are likely to find venture capital background for financing growth and entering international markets.

The institutional venture capital and private equity investments are professionally managed capital investments in firms not listed on stock exchange, where the professional management is provided by specialized mediators. General partners raise funds, collecting capital from individuals and institutional investors (from limited partners) to invest in portfolio companies not listed on stock exchange. Hands on investment means that investors (general partners) play an important role personally in the management of the portfolio companies. The principal goal of this long-term investment is the capital income yield during the exit, selling stocks on a higher exchange rate (Prowse, 1998; Karsai, 1997; Becskyné, 2008).

As a member of a research group, I examined, whether Hungarian spin-off companies were able to find venture capital investors, and whether it lead to the growth of the company and its markets.

In the first part of the article I present the status of the most important indicators in connection with entrepreneurship, than I write about the measures of start-ups, especially with high-growth potential. I also describe the venture capital investments' rates differing classical venture capital investments, that points out the number and the amount of venture capital investments financing early stage firms with high-growth potential.

In the second part I show the results of my research about the growth potential and financing of Hungarian spin-off's. I summarize the obstacles of Hungarian spin-off's growth and involvement of venture capital.

The Hungarian innovation system has developed continuously despite of the crisis. In the Global Innovation Index (GII) Switzerland, Sweden and the United Kingdom ranked the first three spots. Hungary is positioned by the

Global Innovation Report 2013 as an innovation learner, an efficient innovator, and is among the eighteen[1] emerging, high- and middle income economies, as a high income one. These economies are rapidly improving the innovation capabilities, demonstrating a 10% or more higher level of innovation compared with other counties with similar income levels as a result of good policies of institutions, skilled labor force, innovation infrastructures, integration with global markets and linkages to the business community. Hungary ranked first in the world in the Audiovisual &Related services exports index, and is among the first ten in FDI net outflows (%GDP) (ranks 5th), Knowledge absorption (rank 6th), Creative goods exports (%) (ranks 7th), and as a total index of Knowledge & technology outputs it ranks 13th. The indexes also shows what has to be learned or developed in Hungary: in the Market sophistication index Hungary ranked the 87th spot, because of the low rankings of Microfinance gross loans, Investments, the Ease of protecting investors and the Market capitalization, where the country ranked around 100th (Cornell University, INSEAD, and WIPO, 2013).

In Hungary some special innovation factors are among the bests in the OECD countries, e.g. the Audiovisual & related services exports, FDI net outflows, Knowledge absorption etc., but we have to learn more in the field of Microfinance gross loans, investments, ease of protecting investors and market capitalization. So in case the financial environment strengthened, taking advantage of special benefits, there would be more innovative venture backed firms. The changes in financial situation concerned the parameters illustrating the management of the enterprises, influenced the competitiveness, profitability, effectiveness, etc. (Herczeg, 2009, Fenyves-Tarnóczi, 2011, Orbán, 2003).

In this learning process innovation hubs would mean an important supporting role. Innovation hubs can help in creating a differentiating capabilities system that offers a sustainable competitive advantage. In the innovation hubs, like Silicon Valley, hundreds of ideas are generated, and as there are prospering companies, more and more amounts are invested in research and development, accelerating the process of new product creation. Public and private sectors have important roles in developing an appropriate innovation ecosystem, in order to support innovations (Cornell University, INSEAD, and WIPO, 2013).

Entrepreneurship as a source of innovation

According to the survey Flash Eurobarometer Entrepreneurship in the EU and beyond published by the European Commission in 2010 87% of respondents answered, that the appropriate business idea was important, during the decision making of starting a business. 84% of the respondents answered, that it was important to have the necessary financial resources.

The survey examined the reasons for preferring self-employment. The reason "personal independence, self-fulfillment and the chance to do something of personal interest" ranged from 43-45% in Iceland and Japan, to 83% in Hungary. The "better income prospects" was the second most popular reason among Hungarian respondents, reaching the highest rate ranking from 4% in Finland to 60% in Hungary. The "freedom to choose their own place and time of work" ranged from 18%-21% in Greece and Germany to 68% mentioned in Luxemburg. In Hungary 48% of respondents chose this reason. Hungarian respondent were the most likely (26%) to say that they would prefer self-employment to be able to realize a particular business opportunity (European Commission, 2010).

According to this survey, Hungarian respondent's entrepreneurial motivations are mostly defined by the personal independence, self-fulfillment and the chance to do something of personal interest and better income prospects. The freedom to choose their own place and time of work is also an important reason to become an entrepreneur. In this interpretation, innovation is not among the motivators of most entrepreneurs, but entrepreneurs founding high-growth potential firms can create a special segment of companies.

Status of start-ups especially for high growth potential

The recent crisis, characterized by tighter credit restrictions, has arguably hampered new start-ups and impeded growth in existing start-ups as well as their ability to survive in tough market conditions. The significant rise in business closures, especially of micro and small enterprises, in recent years, bears stark witness to these difficult conditions and highlights the need for statistics on entrepreneurship that can support policy makers. Entrepreneurship at a Glance contains a wide range of internationally comparable measures of entrepreneurship designed to meet this need.

According to the survey made on behalf of the OECD (Entrepreneurship at a Glance 2013), the start-up rates still remain below pre-crisis levels in most Euro area economies, but tentative signs of stabilization are emerging. The high-growth enterprises generally represent on average only a small share of the whole enterprise population, ranging from 2% to 4% for most counties, measured on the basis of employment growth. On the basis of turnover the shares were twice as high, but both measures were still lower than in 2006 in almost all counties. The share of high-growth firms were higher in the service sector, than in manufacturing, in all counties for the measures based either on employment or on turnover. The rates of Hungary were around average (OECD, 2013).

[1]The eighteen countries are: the Republic of Moldova, China, India, Uganda, Armenia, Viet Nam, Malaysia, Jordan, Mongolia, Mali, Kenya, Senegal, Hungary, Georgia, Montenegro, Costa Rica, Tajikistan and Latvia

Status of venture capital investments especially for classical ones

According to the empirical evidences provided by Ortin-Angel and Vendrell-Herreto (Ortin-Angel – Vendrell-Herreto, 2009) young university spin-offs attract more venture capitalists than other technological start-ups, explained mainly by the lack of managerial skills among these firms' founders. Others found that founders of university spin-offs have higher formal education levels (Siegel-Waldman-Link, 2003), but fewer managerial skills than founders of other start-ups (Shane 2004, Vohora-Wright-Lockett, 2004). Initial studies found, that venture capital investors prefer financing founders with higher qualification (Macmillan-Siegel-Subbanarasimha 1985, Birley-Lelelux, 1996, Shepherd-Ettenson, Crouch, 2000). At the same time the entrepreneurs prefer preserving decision-making control and ownership, so they involve venture capital, only when it is necessary. But if it is necessary, they are ready to do it in the shortest possible time (Bácsné, 2011).

In the majority of OECD countries, venture capital investments represent a very small percentage of GDP, e.g. often less than 0.03%. Israel and the United States have outstanding rates, 0.5% and 0.2% of GDP respectively, that indicates a mature venture capital industry in these two countries. Parallel the crisis has affected the venture capital industry in all OECD countries, and the level of venture capital investments was around 60% of the levels measured is 2007 in most counties, only in Ireland and Luxemburg exceeded the pre-crisis level.

40% and 30% of venture capital investments in the US and in Europe were made on the field of life sciences. Investments target companies in their start-up and later-stage ventures; and only a very small number of companies are backed by venture capital (OECD, 2013).

Zhang (2008) found that university spin-offs have higher survival rate, but in terms of the amount of venture capital raised university spin-offs do not show significant differences, such as the probability of IPOs, making profit or the size of employment.

The size of the Hungarian venture capital and private equity industry (VC&PE industry) measured as "a percentage of the value of investments into companies headquartered in Hungary as a proportion of the country's GDP" (Karsai, 2013, pp. 25) Hungary had a prominent rate among the EU and even among the OECD members (OECD, 2013), although for the investment/GDP the ranking of Hungary has dropped from the fifth in 2006 to the 22nd in 2010. However the size of the venture capital and private equity market had high rankings, usually it was influenced by high value individual buyouts (Karsai, 2013).

The Hungarian classical venture capital market, financing small and medium size enterprises with a high growth potential, has usually got the lowest rankings in Europe, typically below 10% of the EU average. In the period 1989-2010 approximately half thousand investments were made in classical venture capital investments in Hungary. The number of enterprises getting venture capital during the twenty year period was only 0,2% of the double entry bookkeeping enterprises in Hungary, though in the EU 6% of the small and medium sized enterprises got venture investment. According to the OECD survey the number of venture backed company rate per 1000 enterprises was 0,02, though the OECD rate was around 0,28. These low rates are because of the relatively young venture capital market and less developed capital market. According to Hungarian researches the barriers of the classic venture capital investments are not deriving from the supply side, but the demand side (Karsai, 2013).

According to a survey made in 2008 (Szerb, 2009) only 0,25% of Hungarian SMEs, are suitable for VC investments, and the potential targets of institutional and venture capital investors are around 400 to 600 firms. Before the dot.com bubble the lack of these investments were caused by low quality management. According to the recent surveys, the barriers of the investments are not only the information gap between the demand and the supply side, and the lack of the

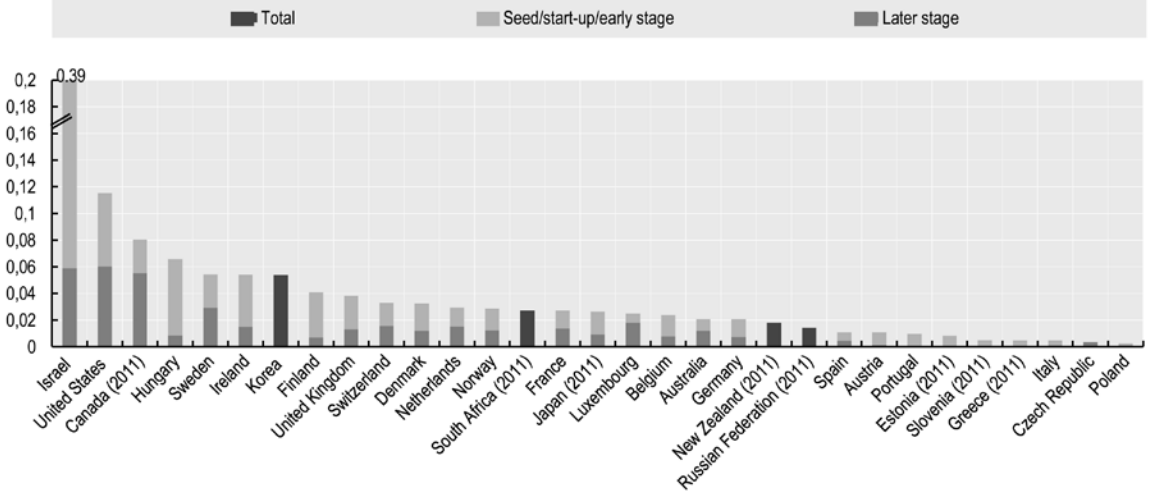

Figure 1: Venture capital investments as a percentage of GDP (US dollars current prices), Percentage, 2012
Source: Entrepreneurship at a Glance 2013 – © OECD 2013

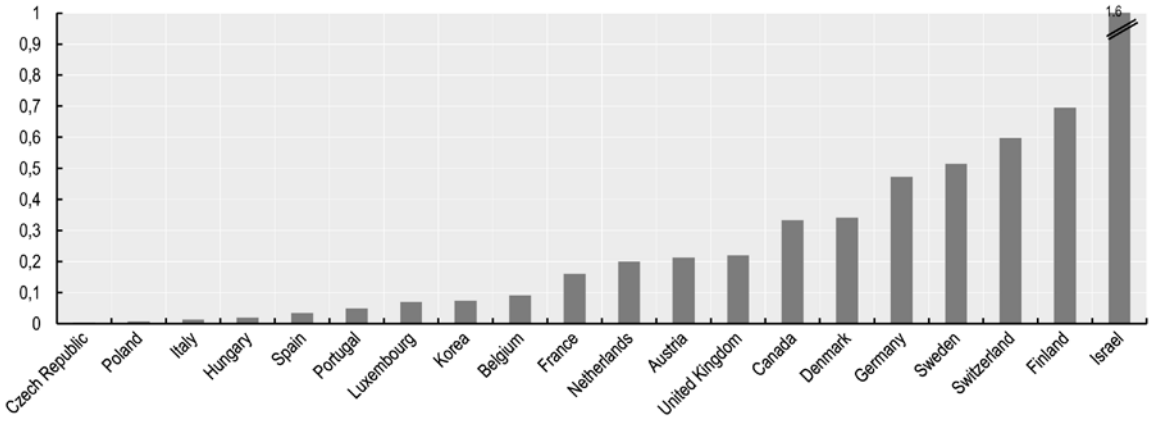

Figure 2: Venture capital backed company rate, Per 1000 enterprises, 2010
Source: Entrepreneurship at a Glance 2013 – © OECD 2013

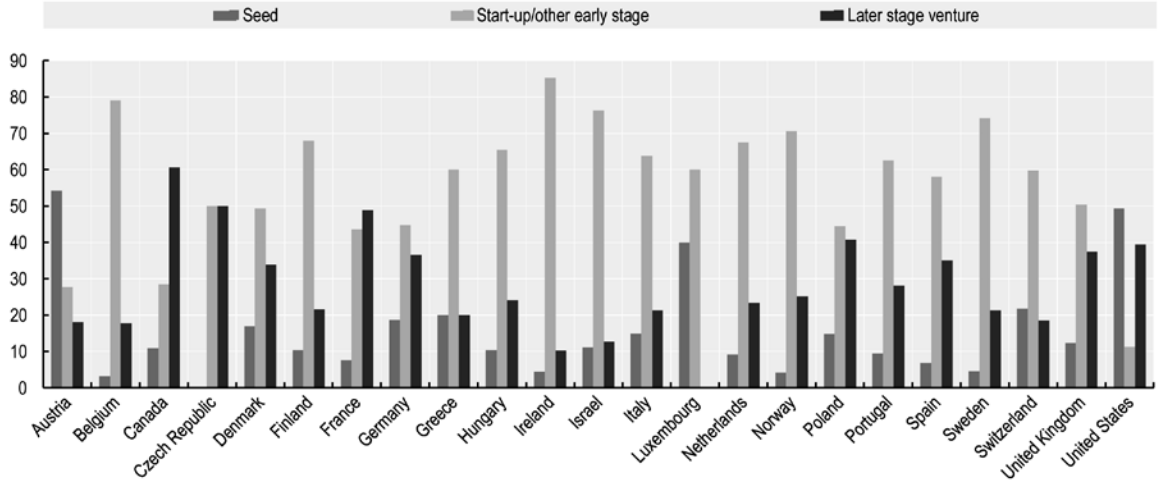

Figure 3: Venture capital backed companies by stage, Percentage, 2011
Source: Entrepreneurship at a Glance 2013 – © OECD 2013

supporting organizations, but the also the poor competitiveness and low level of innovations and still the low quality of the management, so the enterprises are not ready to be invested in (Karsai, 2013).

The venture backed enterprises were more competitive than others, and showed higher differences on the field of the individuality of the product, quality of technology and the continuity of innovation (Szerb, 2009).

So the innovative, technology-based small firms with individual product have high growth potential, and in this contest automatically become potential targets of venture capital investors.

Methodology

Our research team made a survey in four large university cities in Hungary (Budapest, Debrecen, Pécs and Szeged) in order to learn more about Hungarian academic spin-offs. According to our definition the founders of the companies were those who have developed technologies or created research results through their university work and utilized these within the spin-off companies in a state university. The researcher was a university associate in the moment of company foundation, and could remain in this position after the foundation, and did not need to have a formal connection with the company. The immaterial means had to be intellectual property based on some kind of new technology and/or a codified knowledge.

Before the research there was no available integrated database, statistics on the national spin-off companies, which made the research difficult, so we had to develop a database. To identify potential university spin-off companies we used our own personal contact systems, the university technology-transfer offices, and internet sources. During the implementation we succeeded in identifying 80 university spin-off companies, and we successfully involved half of them in the personal queries. According to our estimations, we succeeded in identifying half of the national university spin-off companies in line with our definition. 40% of the queries were located in Budapest, while 20%-20% were in the provincial cities.

During the research we implemented a questionnaire-based personal query, then we examined the composed questionnaires, beside the companies' basic information (company name, headquarters, year of foundation, sector

of activity, knowledge-intensive industry, information from annual reports), also the innovative activities and intellectual portfolio, the founder researcher as a person, his/her motivations, social capital, and the companies' connection and cooperation with the parent-institution. Moreover, information on the companies' functioning, growth, performance and financing were also subjects of detailed analysis.

The growth of university spin-off companies

60% of the companies are in the early phase of their lifecycle, 19% are in their seed phase, 16% at the start-up and 33% are in their early phase, so more than half of the companies being at their early phase got over the seed and start-up period (Figure 4). The tasks in the seed period are the company establishment, concept development, business plan making. The characteristics of the start-up phase are the testing of the prototype, product development, production and the start of the selling.

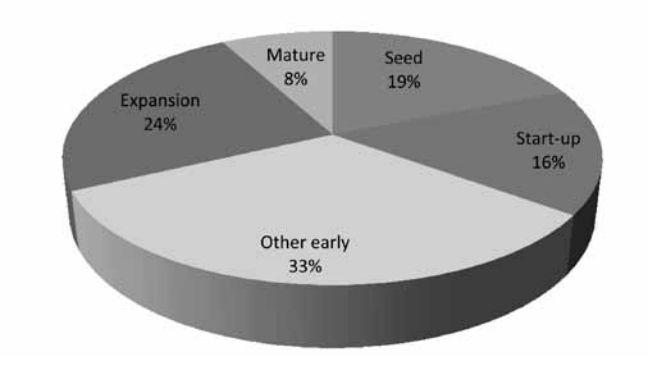

Figure 4: Distribution of Hungarian spin-off companies according to phases of lifecycle in 2012 (%)
Source: own compilation

Seven companies in the sample are in this phase, one of them was founded in 2011, the rest in 2008 or earlier, their age is 5 years in average, so the majority of them are stuck in this phase.

The companies within the sample are in the phase since 29 months in average (minimum 12 and maximum 70), which means that in this time period they did not succeed in entering the phase of early expansion. Since the average annual increase of their revenues is 8%, their entering into the next phase cannot be expected in the near future.

Considering the certain stages of life, most of the companies (33%) are in the early phase, or in the phase of early growth, that means the product development ended, the selling and the marketing are in full swing, the organization is formed (Kosztopulosz – Makra, 2005; Szerb, 2006; Becskyné, 2008). These companies of the sample were formed 3-7 years ago. They are in the early expansion phase for 27 months in average (min. 12, max.48), and the average annual increase of their revenues is 84%. This means that the companies realized the highest revenue in this phase.

After the early stages follows the expansion stage or the phase of market expansion, during which the company may go under rapid growth, one-fourth of the respondents can be classified in this phase, which had been established in the '90s. It's noteworthy that none of the companies founded in the '90s reached the mature phase. Their revenue increased in 8% in average in the past four years, so in their case we can rather talk about stagnation and not expansion. The companies in the phase of expansion, which were established after the '90s, have an increase of revenue of 39% in average, in case we do not take account in the average the one extremely high value 1038%. The average of the revenue increase in the aspect of all companies is 31,6% (when calculating the average the two extremely high values of 1038% and 332% of annual increase were not included).

By the time of reaching the mature phase, the company is usually settled down, the selling stabilized, the revenue is significant, the organization is formed, and the need for external sources is minimal or non-existent. 8% of the assessed companies reached this phase. Within the sample this equals in total three companies, which were founded in 2002, 2005 and 2008, therefore through rapid growth reached this phase in 4, 7 and 10 years through the growing phases of the lifecycle.

The annual revenue of the company established in 2008 was 3,7 million HUF, which means it did not have an expansion potential. The company established in 2005 had revenue of 76 million HUF, while the company established in 2002 had revenue of 203 million HUF, which is a more significant revenue. In the past four years this company's revenue grew 14% in average, therefore its expansion slowed down in the mature phase.

In total we can conclude that some of the spin-off companies are mostly stuck in the seed, start-up phase, or they are stagnating, and they grow slowly in the expansion period. The companies being in their early expansion phase produced the highest expansion, so further expansion can be expected from them.

The respondents rated the level of obstruction on the Likert-scale (1: not at all, 5: entirely) of the listed factors in the aspect of the growth of the assessed spin-off companies. The growth of the spin-off companies is primarily obstructed by external factors, the general economic status being the mostly responsible among them. According to the evaluation, the state also creates serious obstacles in the growth of spin-offs, through unpredictable regulations and the lack of funding opportunities.[2]. Among the inhibiting internal factors of the spin-offs' growth are the company's international acquaintance, short past, and the lack of trained and experienced professionals (e.g. in the field of international selling and marketing) are the most significant. The lack of domestic and foreign demand for the products, the significant administrational burdens and the insufficiencies in the company's system obstruct the companies' growth in over moderate extent *(Table 1).*

[2]Although funding through applications did not prove to be primary motivations for the establishment of spin-off companies, and the researchers are not operating their company for the current application possibilities, but they would like to rely on application funding beside own capital in the company's growth.

Table 1: The listed factors to what extent do obstruct the companies' growth?

Value	Possible answers
3,19	General economic status
3,06	Unpredictable state regulations
3,03	Lack of state funding opportunities
2,97	The company's international acquaintance, short past
2,73	The lack of trained and experienced professionals (e.g. in the field of international selling and marketing)
2,70	Insufficient domestic demand for products
2,70	Insufficient foreign demand for products
2,67	High administrational burdens
2,64	Insufficiencies in the company's organizational system
2,56	High tax and social security burdens
2,54	Internal leadership, management insufficiencies, problems
2,48	The lack of venture capital
2,39	Lack of good business potentials
2,33	Lack of loan sources
2,29	University bureaucracy, lack of supportive environment
2,00	Lack of adequate business partners and suppliers
1,97	Insufficiency of business, administrative services (e.g. legal, consultancy, commercial)
1,91	Lack of own equity
1,89	Unfair competition
1,67	Lack of technology transfer services
1,53	Low international competitiveness of products
1,08	Low quality of the used technology

Source: own compilation

The low quality of the used technology and the low international competitiveness of products almost do not at all obstruct the growth of spin-off companies, therefore the used technologies and the products are competitive on international level. The lack of own equity does not represent an obstructing factor in the aspect of financing, the lack of loan sources and venture capital moderately obstructs, but for the assessed companies the lack of state funding opportunities represents a significant burden. This is rather remarkable having in mind that 62% of the assessed companies received funding from state/community sources, but only 11% got venture capitals and only 9% received angel investor financing. This draws the conclusion that the assessed companies would primarily seek financing opportunities from the expansion of non-market "soft" state sources and in comparison their will or possibility for the integration venture capital is lower.

The financing of Hungarian university spin-off companies

Table 2 shows the percentage of the companies within the sample reporting to have been received financial support in the given phase of growth. Since the current phase of lifecycle is different among the companies, hence the company being in an early phase could not have chosen an answer of e.g. financial support for expansion, but the data in the columns can be compared with each other. Two-thirds of the companies used their own savings in the seed period, while one-third received non-refundable financial support from the state. The companies that financed their activities through involving a foreign capital or an angel investor or a close family member, also reached the high percentage of 22,2%.

In the start-up phase the non-refundable financial sources got the most scores as financing sources (41,7%), the own savings got the second place (36,1%). The sequence is very similar among other companies being *in other early stages or early expansion*, where the respondents ranked 33,3% and 19,4% the above mentioned sources. In the phase of *expansion* most of them selected the non-refundable sources, but the own savings were preceded by close family members and financing through customers. By the way, financing through customers in all phases indicated 16,7%.

Table 2: Financing sources of the Hungarian spin-off companies in the various phases of their lifecycle (proportion of those indicating the given answer compared to the total number of respondents, %)

Financial sources	Seed	Start-up	Other early	Expansion
Stranger individual/ external capital/angel investor	22,2	13,9	2,8	2,8
Distant family members, friends	2,8	0	2,8	2,8
Close family members	22,2	11,1	5,6	16,7
Own savings	66,7	36,1	19,4	8,3
Other non-financial company	5,6	2,8	2,8	0
Venture capital company	5,6	13,9	8,3	0
Refundable state (EU) support	8,3	5,6	2,8	0
Parent company	5,6	11,1	8,3	2,8
Non-refundable support	33,3	41,7	33,3	19,4
Short term bank loan	2,8	2,8	13,9	2,8
Long term bank loan	5,6	11,1	8,3	8,3
University	11,1	8,3	8,3	2,8
Supplier	2,8	2,8	2,8	2,8
Customer	16,7	16,7	16,7	16,7

Source: own compilation

Remark: more answers were acceptable

In the start-up period the venture capital financing received the highest proportion, followed by the period of early growth and seed, but in the expansion period none of the companies received venture capital. Financing through distant family members, friends, other non-financial companies and suppliers were selected in little number, and an even smaller proportion chose the refundable state support (e.g. preferential loans), parent companies as well as short term and long term bank

loans. The short term bank loans were selected in the early growing stages, while the long term bank loans in the start-up phases in 13,9% and 11,1%. The significance of university sources is similarly low; it only got over 10% in the seed phase. Overall, the Hungarian spin-off companies within the sample primarily rely on own resources and non-refundable state funds in financing their activities, and the 3F-s' role is also significant (family, friends, fools – i.e. strangers) in the seed and start-up phases.

The institutional venture capital does not mean general funding source for them, despite the fact that technology-oriented companies, in the same time spin-off companies with big expansion potential are more likely to receive venture capital than other companies.

The institutional venture capital financing of the Hungarian spin-off companies

The respondents indicated their experiences connected to venture capital financing in all different cases on a five-point Likert scale (Table 3). Considering the average of the answers the highest value was reached by the variable indicating that the venture capital investors do not know enough about the given technology. The international competitiveness of the applied technologies do not mean problems in the aspect of the growing of the companies as mentioned previously, but in the aspect of finding investors. The new nature of the technology may cause an information gap, therefore the venture capital investors do not know the applied technology, but if – not only in the owners' opinion of realistically – the technology or the product is internationally competitive, there would probably be will from the venture capital investors' side to finance the company. The availability of venture capital for the spin-off companies could be resolved through dissolution of the informational asymmetry.

The venture capital investors do not like to invest small amounts, which is the second significant problem and a problem also confirmed in the international literature, is the venture capital investors moved in the direction of financing companies in later phases of growth or companies with bigger capital needs and mainly to out buying due to economics of scale reasons. According to Pinch and Sunley (2009) although the UK venture capital industry is the most developed in Europe, the early-stage financing is much smaller and less active than in the US. The capital gap and informational asymmetry together result a financing gap in the early stage (Becskyné, 2008; Freear et al., 2002; Freear et al., 1994; Freear and Sohl 2001). The financing gap could be overbridged through angel investors and through angel investors' networks, and venture capital networks. Investments and knowledge exchanges are often made across considerable distances, (Pinch and Sunley, 2009). The supply of venture capital of the spin-off companies is also trammeled by the high yield expectations of the investors, which is an internationally known characteristic of the supply side similarly to the previously mentioned, since usually the industry is characterized by great growth potential, aiming at international markets, promising high yield of investment when exiting (Karsai, 1997). On the demand side, namely from the companies' view the most important problems arising are the fear of freedom of decision restraint, but on the other hand they do not have adequate entrepreneurial and management skills. These are general problems in other countries, too, but as long as the change in approach does not happen, the spin-off companies cannot expect to receive higher venture capital financing than before.

Table 3: The experiences of the Hungarian university spin-off companies in the field of venture capital financing

Value	Opinion
4,0	The venture capital investors do not know enough about the given technology
3,7	The venture capital investors do not like to invest small amounts
3,6	The venture capital investors have high yield expectations
3,5	The involvement of venture capital investors restricts the company leader(s)' freedom of decision during the functioning of the company
3,2	The venture capital investors averse to financing seed, start-up or early stage companies
2,9	The investment is hampered by the low quality business plan
2,8	The investment is hampered by the lack of entrepreneurial, management skills
2,7	The economic policy does not support enough venture capital investments
2,6	There is not enough information about the venture capital investors
2,6	The exit opportunities for the venture capital investors are bad

Source: own compilation

Conclusions

For the entrepreneurs the most important requirements of starting a business are the appropriate business idea and the necessary financial resources. The Hungarian entrepreneurs are mostly motivated by personal independence, freedom and better income prospects and not innovation. In occasion of venture capital investments the entrepreneur has to give up part of the independence and needs to cooperate with the investor to generate high-growth and international business success. According to the survey the founders of spin-offs find that the involvement of venture capital investors restricts their freedom in decision making and it can remain an important obstacle for venture capital financing. The creation and growth of university spin-offs can be stimulated by lowering information asymmetry and facilitating contact and trust between venture capitalists and entrepreneurs, especially in cases where the lack of managerial skills of entrepreneurs occurs. The founders generally they do not have enough managerial skills and they are not able to write high quality business plan.

In Hungary the number of internationally competitive spin-offs, ready and willing to involve venture capital, is much lower than in the US or Western European countries.

The founders find that the venture capitalists have too high expectation, and however the founders would need the capital, managerial skills and network provided by venture capitalist, they are not willing to give up their freedom. The Hungarian founders of spin-offs should learn more about the form of venture capital financing and the venture capitalist should have more information about the technologies of spin-offs in order to reduce the information gap between the demand and supply side of venture capital. At the same time the financial environment of Hungarian firms should be strengthened by the government in order the venture capital contracts to be concluded satisfying either the venture capitalists or the entrepreneurs of Hungarian spin-offs. Until Hungarian spin-offs are able to involve soft money from state sources the improvement of venture capital demand cannot be expected.

Hungary could take advantage of benefits in some special fields if innovation, as the country has the best rates in some indicators of innovation. The efficiency of information flow between the venture capitalists and entrepreneurs would lead to more transactions and more Hungarian spin-off would reach international successes. The latest years' policy and special programs like JEREMIE generated more transactions, that helped to inform the entrepreneurs about venture capital and helped to co-invest public resources with private equity more efficiently, but the global crisis had negative impact on the industry.

The spin-offs are more likely to involve venture capital, than their counterparts, so generally they can create relatively higher economic growth, but because of the low number of occurring and potential venture capital backed spin-offs, they cannot have a high impact on total economic growth.

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CROSS BORDER CO-OPERATION IN RURAL AREAS GIVING THE EXAMPLE OF BIHAR REGION

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Abstract: After the political changes in 1990-ies in Hungary and in East-Central Europe the process of forming cross-border regional co-operations reached a new period. The border regions of the different national states join to encourage co-operation. The most remarkably connected system in our region is the Carpathian Euroregion. This paper deals with one of the most successful initiatives started between Hungary and Romania. The most outstanding co-operation of the past few years exists between the settlements of the former Bihar County which territory today belongs to two countries. The aims of the paper are to research the development of the border region; to reveal the factors of the cooperation and to observe the possibilities for the development. To obtain the goals desktop research, cluster analysis and data analysis were used, as statistic methods. The results emphasize that the development and renewal of the cross-border co-operations were supported by historical factors and good practices adapted from Western Europe. Although economic backwardness or the administrative problems are against the cooperation, historical economic connections facilitate the common work in the Hungarian-Romanian border region.

Key words: Rural areas, cross border co-operation, Hajdú-Bihar/Biho

Introduction

Type of borders in Europe

Before 1990 but following the changes of regimes in Central Europe, research into border regions has been increasingly adverted (Ratti 1993, Csatári 1995, Aschauer 1996, Csordás 1998, Baranyi–Mező 1999, Hardi.–Rechnitzer 2003, Horga 2012). However, various suggestions of researchers came into light on the definition and role of borders (Mező 2000).

Border regions and cross-border cooperations in Europe are classified into three types (Martinez 1994, Pál – Szónokyné 1994, Tóth – Golobics 2006, Süli-Zakar et al. 2000, Sersli-Kiszel 2000, Baranyi-Dancs 2001). The first type has been developed in a Western European environment where regions with several common features (backwardness, underdeveloped infrastructure) meet. Such are the French-Italian or the Spanish-Portugal border regions. The second type is a somewhat modified version of the above with the difference being that problems originate, in general, in the cross-border planning (environmental, infrastructural or border crossings) deficiencies of the neighbouring regions. The third type includes countries either bordering EU countries or not as such. This type can be further divided into three subtypes. The first subtype includes the border regions of countries classified as developed regions of the continent as e.g. Austria, Switzerland, Norway or Finland. The second subtype, the so-called Central European type includes the border regions among the Czech Republic, Poland, Slovakia, Slovenia and Hungary. The third subtype is the so-called Eastern European including the Baltic States, the European member states of the former Soviet Union and the countries of the Balkan Peninsula. These areas can be described by peripheral features; they are basically the peripheries of the periphery (migration, ageing, high unemployment). The Hungarian-Romanian border regions belong to this type.

Material and methods

Data collection has been carried out in two stages. Desctop research included the analysis of the relevant documents related to the studied area while during secondary data collection data were collected from institutions (Hungarian Central Statistical Office, local governments). Furthermore, cluster analysis was carried out with the aim to classify the border regions of Hungary. . The objective of cluster analysis is to classify objects into homogenous groups disjunctive for each pair and covering the entire carrier. In our study, among the non-hierarchal methods of cluster analysis, K-means algorithm was applied. K-means algorithm classifies each element to the cluster that has a mid-point closest to the given element. By applying cluster analysis, our results and the statistical study of the division of objects comprising the heterogeneous population into homogenous groups can be demonstrated simultaneously. Such groups are called clusters.

Results

The Bihar regional cross-border co-operation developed on the territory of two undeveloped, economically backward

regions for which the term "periphery meets periphery" may be applied. To analyze the border regions in Hungary a cluster analysis was carried out for 5 indicators related to economy and society (Tagai et al. 2008, Bujdosó et al. 2011). As the *Figure 1* shows Cluster 2 includes the vast majority of border micro-regions, i.e. approximately 39 micro-regions out of 154. As their general feature, a low value for all 5 indicators is observed. All of the micro regions among the Hungarian – Romanian border belong to this Cluster.

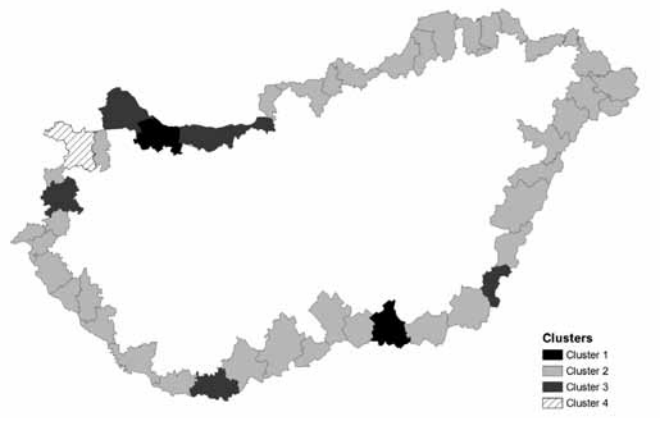

Figure 1: The competitiveness of the border regions in Hungary in 2011
Source: Bujdosó et al., 2011

Lots of ideas came to light in order to resolve the peripheral situation, but most of them remained unsuccessful.

The backwardness of the area is not a new phenomenon and it has got several reasons. Since historical factors played highly significant role in this process, we analyzed them in details. Before doing so, a few words should be said about the disadvantageous natural circumstances which obstructed the territory in joining the modem socio-economic development during time.

The swamp which was fed by the rivers Karas and Berettyó was drained too late. Only at the end of the last century the river and flood control let the settlements to enlarge their territories (earlier only the "island-like" territories above the water level were inhabited) and the arable land which was the base of their living. The economic development can actually be traced from that time, though the circumstances of the river control still exist.

Table 1: The change of the territory and the population of Bihar county

Year	Area (km^2/%)	Population (inhabitants/%)	Population density (inh./km")
1787	11,082/3.8	317,871/3.9	28.7
1910	10,609/3.3	582,132/2.8	55
1930	2,771/2.9	176,002/2.0	63.5
1941	6,511/3.8	447,000/3.0	69

Source: Frisnyák, 1995

Besides the sodification caused by the alternating groundwater level, the danger of inloading water and floods are common due to the deforestation in the catchment area in Romania. So, nature was cruel to the inhabitants and was one of the reasons for the backwardness. But even more important reasons – as mentioned above – are found in the historical political processes.

Let us examine the factors which determined the economy and society of Bihar county. The territory of "Bihar county" experienced significant changes throughout the history, often separating or connecting the population (Table 1) .

Radial road and railway system was connecting the rural settlements with the central town Oradea, so the region depended on Oradea both administratively and commercially. The town was the centre of the municipal district of Oradea, regional finance-directorate and public prosecutor's office, tax office, head post office and directorate of public construction. Relying upon these functions, the city became the regional centre not only of the county but of the Great Plain

After the WW I the county was divided into two unequal parts belonging to two states: Romania and Hungary. Bihor county on the Romanian side is still existing administrative unit (Béres- Süli-Zakar 1990, Demeter-Radics 2009). The part on the Hungarian side was disconected from its centre Oradea and had no transport network: (1) there was no connection among the routes and other roadsections; (2) and there was almost no spatial connection among the settlements. Most of the population on the Romanian side of the border was Hungarian so the border separated families from each other. The Treaty after the WW II built the permanent borders and the administrative reform of 1949/50 terminated the meanwhile existing "Incomplete Bihar" on the Hungarian side: the settlements of South-Bihar were annexed to Békés county, while the other were annexed to the newly created Hajdú-Bihar county. As a consequence of this, it got into a marginal and peripheral position in relation to the axis of the spatial system and to the former county capital (Kovács 1990).

The regional development policy of the following 40 years led to the preservation of Bihar's backwardness, because the sources of development were principally given to the county capitals and cities. Nevertheless, a significant withdrawal of capital from the Hungarian regions has started (Béres-Süli-Zakar, 1990). Berettyóújfalu, the newly created micro-regional centre, together with the key rural settlements were unable to play a significant role both administratively and economically along the borderline. Furthermore, the Hungarian population of the divided territory had lost its communicational possibilities from the 1950s as the border's role became more separating.

As mentioned above, Oradea has been connected with Budapest and Europe through the Püspökladány-Berettyóújfalu-Oradea corridor. The regional line, which developed on the peripheral territory, is the main road No. 47. The settlements could connect to the county road system, even semi-peripherally, via this road but still had difficulties to reach the centre towns *(Figure 2).*

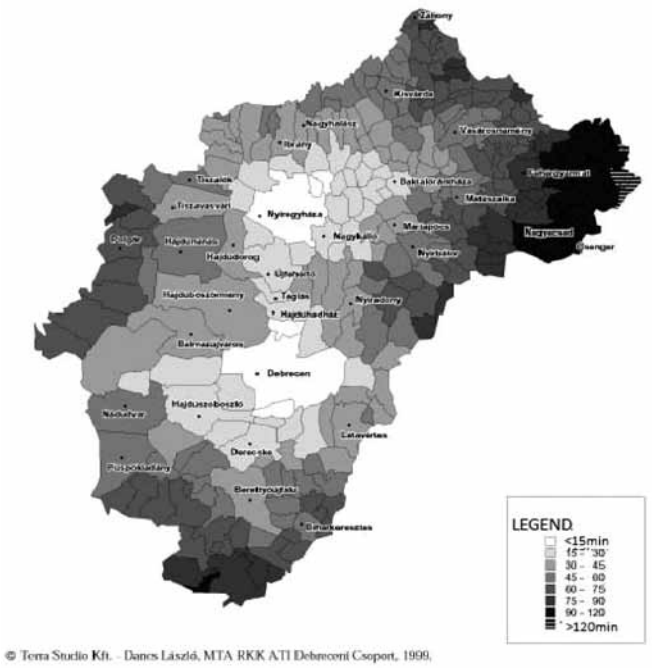

Figure 2: The availability of the county centre from the settlements in the Hungarian–Romanian border region
Source: Balcsók et al. 2011

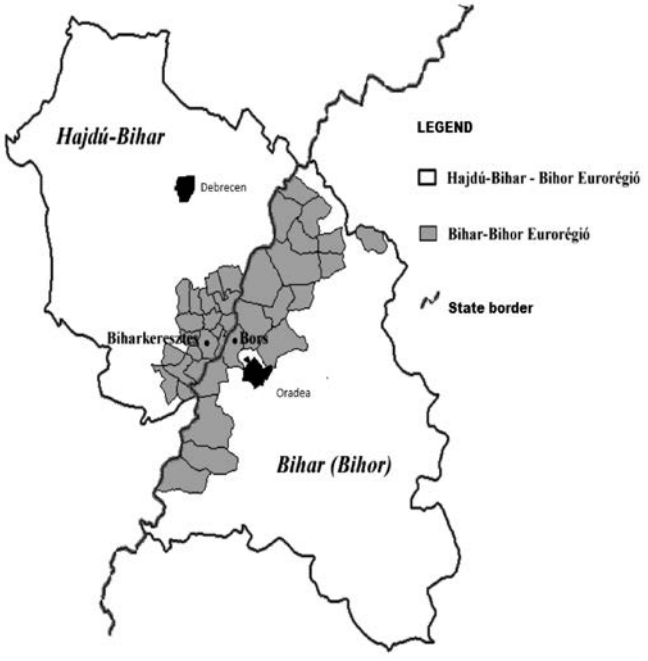

Figure 3: The Bihar-Bihor Euroregion
Source: MTA RKK Debreceni Osztálya, 2010

On the Romanian side the villages connected to Oradea are still strongly linked to it, and the centre is easily accessible. The regional line of Oradea – Cluj-Napoca (which is the only major international corridor) is linked to the other structural corridor of north-south direction (Satu Mare- Arad-Timisoara), which strings the villages. The Romanian policy after the WW II, similarly to the Hungarian, promoted to retain the low living standards in the bordering regions which was further decreased by the agrarian character of the economy.

The size of the settlements became different on the two sides of the border. The Hungarian part of Bihar is characterized by small villages, while Bihor has large villages with large population. These once neighboring villages became far away from each other due to the border and they nearly lost all their connections. To reinforce this fact we examined the settlements which belong to the Regional Agreement of the Borderland Settlements of Bihar *(Figure 3).*

There are only five border crossings among the settlements on both sides of the frontier, and only two of them is on the Hungarian side (Biharkeresztes and Ártánd). Only 8 of the 20 studied Hungarian settlements have railway stations, while on the Romanian side the rate is 11 out of 16, and only Biharkeresztes, Mezőpeterd, Salonta and Valea lui Mihai lie along an international railway line. The situation with the road network is not better either. Only three of the Hungarian settlements lie along main roads, – although it is the busiest road 42 (E60), which is essential in respect of the Hungarian – Romanian connections. The most of the Bihorian villages (11) are stringed by this and the Carei (Nagykaroly) – Salonta road.

So the political changes have put a closed border between Hungary and Romania, which made any co-operation impossible. "Bihar County" used to be adjoining but later almost totally isolated territory with a previously co-existing population, which later became separated (Dövényi 2002).

The changes after the WW II caused changes not only in the spatial structure or in the administration. Oradea, which was a prospering centre at the tum of the century, together with at the time rising settlements along the roads between Oradea – Budapest and Oradea – Cluj-Napoca fell low in an instant. "Oradea developed in the so called "trade route" and the effective town-planning forces raised the town amongst the most significant commercial and industrial towns of the country" (Fleisz 2002). The surrounding settlements embodied the efficient town-village connection as they provided food for the employer town. This connection was ruined by the introduction of hard border. Bihor had kept its centre, administrative and transport network, and it developed relatively freely.

Although Bihor kept most of its administrative and territorial infrastructural, the policy of the Ceaucescu regime pushed Bihor to the background, especially its border region. The rural region with its one-sided agrarian character became the "outcast" of the otherwise underdeveloped Romanian economy and the development funds were mostly given to Oradea. The disadvantageous state of Hungarian part of Bihar has also deepened especially after 1950, and the differences became even more dominant within Hajdú-Bihar. The county management treated this Bihar region as a "stepchild" during the past 40 years. The backwardness was intensified by the dominant agrarian character of the region, and only Berettyóújfalu could rise from this inherited state. Although the economic activity of the region became stronger in the 1970s, migration and unemployment increased, and the employment situation worsened after the political change in the 90-ies.

As mentioned earlier, the borderline is in marginal situation. To reinforce this, we examined some indexes, which clearly show the region's backwardness. The decrease of population is serious in the studied settlements. "The rates of population decrease of the Biharian villages are higher than the average rate of the disadvantageous regions" (Béres -Süli-Zakar1990). Some say, that the harmful shift of the age distribution or the ageing problem is typical of these territories. So it is in most settlements of Bihar. Considering the data of the studied 35 settlements, it turns out that the rate of the people aged over 60 is more than 20% higher in case of the 15 Hungarian than in the 12 Romanian villages

In case of 6 Hungarian and 9 Romanian settlements the situation is really depressing, the rate of the young (0-19 years) is quite low. The high rate of the young is due the high natural increase of the gypsy minority. The age distribution of the distribution of the territory is shown by *Figure 4 and 5.*

Figure 4: The age distribution of the examined Hungarian settlements
Source: Author's work based on the data from.Hungarian Central Statistical Office, 2011

Figure 5: The age distribution of the examined Hungarian settlements
Source: Author's work based on the data from.Institutul National de Statistica, 2011

Besides the ageing, the migration of the young people of working age is a problem, too. The lack of housing, the unfavorable educational and living conditions and bread-and-butter worries play a significant role in the migration from this territory. Possibilities of employment can only be found in the neighboring cities, although in limited numbers. Nowadays, the labour market is more and more looking for highly qualified workforce. From this point of view the Bihar region is also disadvantageous. The figure 6 shows the average educational level of the studied settlements

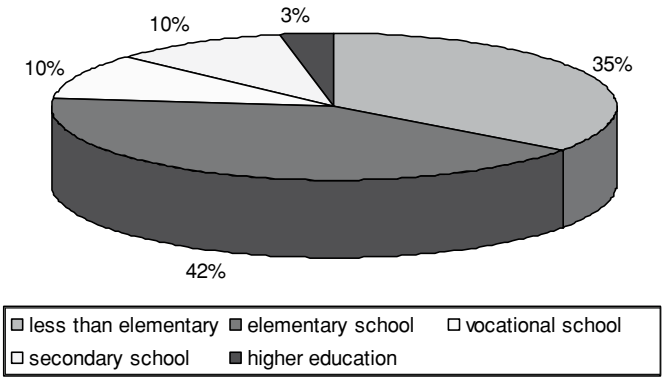

Figure 6: The distribution of educational level among the population of the examined settlements
Source: Author's work based on the data from.Hungarian Central Statistical Office, Institutul National de Statistica, 2011

It is depressing, that only half of the population has finished only or has not even finished elementary school. In case of the Romanian settlements the situation is even worse, because more than 40% of the population has not even finished elementary school. The same problems are the low rate of people with university degree, the low average salary, the remmitances, the unfavour structure of economy. The employment level is the essential reason and a consequence as well for the living standard below the average in the disadvantageous regions *(Table 2).* It means that there are not enough workplaces for the population of working age, they cannot work in their dwelling-place, the incomes are low.

Table 2: Unemployment rates of the studied area

	The rate of earners within the population (%)	The rate of unemployment within the population of working age (%)
Hajdú- Bihar	43,7	20,3
Bihor	48,3	16,7

Source: Author's work based on the data from Hungarian Central Statistical Office, Institutul National de Statistica, 2011

Being an agricultural region, industrialisation has hardly reached this area, and there is no local industry, expect for some craftsmen. Hence, the dominance of agricultural workers doesn't reflect the good condition of the primary sector, but the underdevelopment of the industrial and service sectors.

The supply of public utilities in the settlements of Bihar is at really low level. Although the supply of public utilities in the Hungarian settlements is quite good, there are settlements on the Romanian side which lack the supply of drinking water. The state of sewage system is even worse, because only a couple of settlements have a sewage system. The lack of gas distributing system in the most of Romanian settlements is another example of the backwardness of the region.

Besides the low level of infrastructural supply there are other factors that caused backwardness. Foreign investors consider this region as weak, so it is unprovided with capital. The western capital invested into this region is represented by a couple of firms.

The development of the crossborder co-operation in Bihar

The regeneration of the border region connections was the evident consequence of the political change, because "due to the active integrational trends in the area and the decreasing central resources the co-operation became of vital importance for the settlements" (Bokor 1996.). The factors, which led to the establishment of the co-operation are very different. Firstly, as we mentioned in the previous chapter, Bihar county due to the border change after the WW II had lost it former centre, Oradea. The consequences still exist in the region. Despite the development of Berettyóújfalu couldn't act as a real county capital. With the deliberation of border crossing Oradea partly restored its former socio-economical and commercial function, and it positively influenced the development of the Bihar region.

The economic connections between the two countries also revived after the political change and Romania became an important economic partner. Transylvania became the demand market for a great deal of the Hungarian capital export. It's even more obvious in the borderland, where dense economical networks are created due to the geographical closeness. In 2010 more than 200 Hungarian-Romanian mixed companies worked in the border region. This number is quite high, but there is a problem that most of the companies are in the towns, mainly in Oradea and Salonta. Almost no companies had settled down in the villages. The lack of interest is probably due to the poor infrastructure (Lengyel 1996.). It characterizes the lack of initiative of the Romanian part, that 85% of the companies have Hungarian owners.

We also said that there were practical reasons adopted from Western Europe for the establishment of the borderland co-operation. In the western part of the continent and in the EU the settlements along the borders and the borderlands became pronounced and the development of these regions became reevaluated. Bihar is in a fortunate position as after joining the EU the Hungarian-Romanian border became a particularly promoted region (a similar example was the Hungarian-Austrian border with Burgenland and Vas county), where the cross border co-operations have good chances for public financial supports.

Romanian–Hungarian Cross-Border Co-operation Frame began in 1996 with the Phare CBC Programme which was extended up to the EU integration (the period 1996-2003).

Multilateral and multiple factors made it clear and reasonable, but the borderlands of the two countries had to co-ordinate their previously individual activities. The idea of the cooperation in the region firstly emerged in the early 1990's although amongst only the Hungarian settlements. Due to the legal opportunities four villages, by names Szentpeterszeg, Gaborjan, Hencida and Vancsod decided to work together and to form a smaller region. Shortly after its creation 13 other settlement of the borderland (Artand, Bedo, Berekboszormeny, Biharkeresztes, Bojt, Esztar, Kismarja, Korosszegapati, Mezőpeterd, Mezosas, Nagykereki, Pocsaj, Told) joined this initiative titled Agreement Borderland Settlements of Bihar (Tamás 1998). The number of members became final with the inclusion of Korosszakal, Magyarhomorog and Letavertes. The delegates of the settlements voted for Biharkeresztes to be the centre, which is the largest town in the region. The leading president of this alliance is the mayor of Biharkeresztes.

The real crossborder co-operation came into being later, and it was encouraged by the factors mentioned earlier, but mostly by the Phare CBC program support. Firstly, in 1994 the EU implemented this type of support in the Austrian-Hungarian border region. This encouraged some borderlands to get in touch with their neighbouring territories.

The initiative of Bihar met a warm response in the settlements of Bihor county on the other side of the border. As a consequence they declared the agreement in 1995 and established the Regional Development Agreement of Borderland Settlements of Bihar and its legitimacy was provided by the Hungarian-Romanian Fundamental Convention. Bors became the centre of the Romanian side.

It was followed by the Hungary-Romania Cross-border Co-operation Programmes 2004–2006 and respectively 2007-2013 in frame of the cross-border co-operation program Phare CBC. It was supposed to meet the challenges and opportunities of the cross-border area, by capitalizing the previous experience (Ilies et al. 2011).

Another way of support to the partnership between the border regions was the Interreg IV Programme, available within the whole territory of the EU. Regarding tourism the set up of the authorities in the field of tourism, protection and promotion of the cultural and natural heritage can be mentioned as beneficiaries.

Within the framework of the South-East Europe Programme trans-national partnerships were also created. The Romanian–Hungarian Cross-Border Co-operation Programme is continuing the crossborder co-operation programs in frame of the Interreg IIIA in Hungary and Phare CBC in Romania, being implemented within a joint institutional structure by using joint funds, extending and developing the previous experience and results (Ilies et al. 2011).

Conclusions

The results of our study emphasize that the development and renewal of the cross-border co-operations were supported by historical factors and good practices adapted from Western Europe. Although economic backwardness or the administrative problems are against the cooperation, historical economic connections facilitate the common work in the Hungarian-Romanian border region.

The factors that helped the co-operation are the following:

- The common history and traditions: the united/ integrated development of Bihar County and the Biharian consciousness might be a driving force in the region
- National homogeneity: most of the settlements in the borderland have Hungarian population, and Romanian people integrated into the Hungarian community

- historical economic connections/relations: the economic connections amongst the settlements of the Bihar region formed a wide network before the change of borders with Oradea as the economic and administrative centre
- importance of borders: the EU programs made the significant capital inflow possible
- The creation of the Bihar Association: the Hungarian government even indirectly tried to support the regional development of Bihar. Factors against the co-operation:
- Periphery meets periphery: the disadvantageous and underdeveloped regions of the two countries meet each other on the Hungarian-Romanian border
- Economical backwardness, one-sided agricultural character: almost all the development indexes are below the national and the county means
- Weak co-operation between the local governments: the developments of smaller regions and joint settlements organized from below started in the early 90's in Hungary in the hope of co-operation.
- Different administrative system: the difference between the administrative systems and the level of bureaucracy of the two countries are also against the co-operation
- Weak personal relations: the shift of the borders after the WW II has strongly influenced the personal and family relations. Due to the newly developed and closed border the families on opposite sides of the border became separated from each other. The once flourishing connections almost disappeared.
- Emigration: due to the unfavourable economic and infrastructural conditions the young, qualified age-group, which is capable of work, leaves the region. This active layer of the society could be the key factor of the co-operation
- Lack of infrastructure and the difference in the economic, social, customs and tax system
- Regulations are also against the co-operation

The creation and implementation of the cross border cooperation go through several stages which are as follows:

- Get to know the partner region, recurrent arrangements/ actions, purpose: confidence building (Michalkó 2004). The roots of the crossborder co-operation in Bihar already existed, so the partner regions started to get to know each other. Temporarily the connections are mainly cultural, and Hungarian-Hungarian rarely Hungarian-Romanian programs are organized on both sides of the border. Such a co-operation was organized by the local leaders (mayors, economical and regional development expects) and their purpose was to get to know the policy and the rules of the EU. The economic interactions were rather personal initiatives (meetings of businessmen). The difference between the two administrative and regional development systems is an extremely big problem, so it is hard to create connections in this field between the two sides of the border. It would be important for the administrative levels to find the partners.
- The development of crossborder conception and strategy: the second stage of the cooperation is the working out a development conception and strategy based on the know possibilities, and the harmonization of the planning strategies of the region. In favour of this implementation EU programs are used to work out the cooperational strategies on both the Hungarian and Romanian sides of the frontier. In relation to the local level, the experts and decision makers have to join the working out of the strategy. Many development strategies were created for Hajdú-Bihar/Bihor region either regional or sectorial (touristic, economic, etc) (Kozma 2006).
- The aim of the third stage of the plan is to set up an organization and a group of workers the previous bases. This group is competent and responsible for the case at the field of co-operation. In the course of the office work and administration their aim is to use the already existing structure and the co-operation between the organizations, and not to create a new structural level.

The long-range strategy aim of Bihar is to create a common development program based on the known advantages and everyday connections, which helps the union of the borderland. The small region of Bihar, with the help of EU programs, submitted a completion, in connection with economical and institutional improvement.

The cultural relations appeared as occasional co-operations, mainly traditionally bound and folkloristic cultural organizatives. We might see, shut the crossborder co-operation of the former "Bihar Country", which was divided after the WW II, is after the initial stage. It is good, that the connection has been created, although it is mainly of protocol character, but considering the Western European model and the experiences, in case of good financial circumstances the establishment of the Regional Development Agreement of Borderland Settlements of Bihar might be a good example for the borderlands.

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MAIN CHARACTERISTICS OF TRADE OF THE HUNGARIAN CEREALS AND OIL CROPS BETWEEN 2000 AND 2010 AND THE EFFECTS OF CHANGES IN INTERVENTION RULES TO THE HUNGARIAN COP SECTOR FROM 2004 TO 2010[1]

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Abstract: In this paper the trade of the Hungarian cereal and oil crops from 2000 and 2010 are introduced. The general attributes of the Hungarian crop sector are analyzed and a specific picture from aspect of the trade in Hungarian cereal and oilseed sector, with a focus on the quantity of the export and import of wheat, maize, rapeseed, sunflower and other crops and their main target countries. This article also aims to show the impacts of the changes in the EU's intervention rules and provide analysis.

Key words: cereal production, cereal and oilseeds, export, import intervention system, Hungary

1. Introduction

"Minimal differences can be observed regarding the area being under wheat production in Hungary. The sowing area of wheat decreased in Hungary both in 2010 and 2011 as compared to 2009 due to various reasons on behalf of the growers. The profitability of wheat production was low in 2009, and as a consequence a number of growers decided to change the sowing structure to the detriment of the wheat sowing area. The sowing period in autumn of 2010 was exposed to various bad meteorological conditions together with ground water troubles, therefore a number of growers could not sow wheat on the areas previously intended. In summary, it has to be stated that both in 2010 and 2011 wheat production area decreased in Hungary as compared to 2009, however there were completely different reasons for the decrease in case" (KISS, 2012).

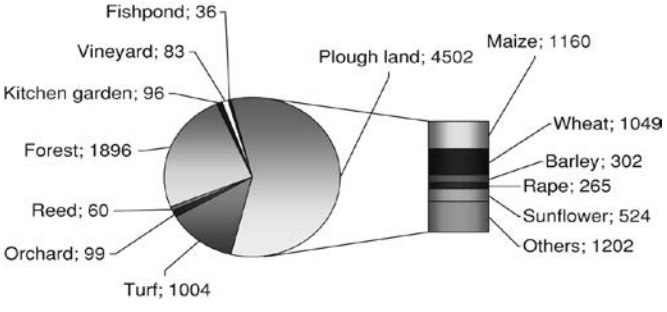

Figure 1: Structure of agricultural land in Hungary and the sowing area structure of crops in 2010 (in thousand hectares)
Source: KSH, 2011 In: KISS, 2012

"*Figure 1* illustrates the structure of the agricultural area in Hungary. Hungary has 4.5 million hectares of arable land. Shares of cereals' sowing area within the Hungarian arable land fluctuated between 68.4% and 69.9% in the period of

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2004 and 2008. The differences between the different years are negligible. The significance of wheat and corn is nearly the same within cereals. Both plants cover approximately 28% of the entire arable land (KSH[1], 2011). In 2009 Hungary, having 1.15 million hectares of wheat producing area, was placed 29th in the world ranking" (KISS, 2012).

2. Objectives, materials and methods

The authors determined their objectives as follows:

- making a general analysis about the Hungarian cereal and oilseeds sector and also the trade of these crops;
- showing the changes in EU's intervention rules;
- analysing the influences of these changes.

Data were collected from international and national databases. The major international source was the FAOSTAT database. The main data about the cereal and oilseed production and export, import quantities were collected from this database. The authors make a general description of the main target countries of the Hungarian cereal and oilseed sector. For this part of the paper, FAO Trade Flow Map is used as well. In addition, the relevant data of the Hungarian Central Statistical Office were collected also for certain aspects of this paper.

For the next logical part of the study, other authors' compositions were used and synthesized. Furthermore, authors contacted employees of the Agricultural and Rural Development Agency and collected data regarding the Hungarian intervention system and stocks.

3. Results and discussion

3.1. Export-import in cereal production

Figure 1 shows the quantity of export and import of the two most important cereals in Hungary. We can see on this graph that both the import of maize and wheat are negligible.

Our cereal production is export oriented. *Figure 1* proves this statement, because Hungary exported significant quantities of these cereals every year. The export of wheat was the lowest in 2000, but afterwards it increased in 2001. It stagnated between 2002 and 2003. The Hungarian export of wheat rose gradually from 2004 to 2006. In 2007, it dropped again, but it increased again by 2008, in which Hungary exported 2.1 million tonnes of wheat. In 2009, it fell by 452 thousand tonnes. 2.18 million tonnes were exported in 2010, the highest point during this period.

[1]Hungarian Central Statistical Office (abbreviation: KSH)

The export of maize was similar to the export of wheat between 2000 and 2006 in all years but one. This exception was 2002, because the export of maize by far exceeded the export of wheat in this year. In 2007, the export of maize shot up dramatically. It was twice as high as in the previous year.

In 2007, the first reason of the change was that there was a serious drought in Europe and there was need for the Hungarian intervention stock. The second reason for the change was that the Hungarian farmers offered a great amount of maize to intervention between 2004 and 2006. The intervention stocks of maize reached the highest level by the year of 2007 due to their offer. The intervention system was treated by the Hungarian farmers as if it was a fixed market with fixed prices. Due to this kind of thinking, the Hungarian intervention stock was the highest in the European Union. On the other hand, the yield of the maize was quite good from 2004 to 2006 and the farmers could not sell their maize. In 2007, Hungary exported its stocks. In 2008 and 2009, the export of maize increased from 3.3 to 4.1 million tonnes. In these years, the yield of maize was invariably good. In 2010, it dropped a little bit.

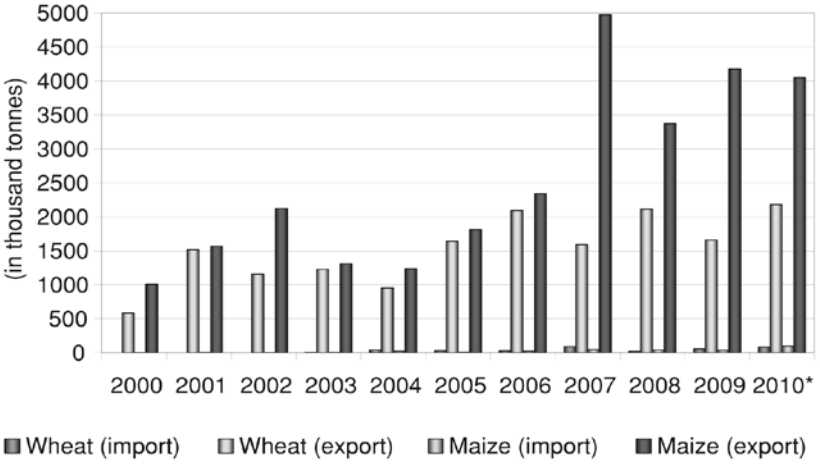

Figure 1: Quantity of the export and import of wheat and maize between 2000 and 2010
Source: FAO and KSH, 2012; *KSH data

We cannot talk about significant changes with regard to these target countries due to the fact that Hungary is a landlocked country. In general, the quality of Hungarian wheat is excellent, but it depends on the vintage of the given marketing year. In 2009, the most important target countries of the Hungarian wheat export were Italy, Romania, Greece, Bosnia and Herzegovina, Austria and Slovenia. These were the top six countries in 2009. The share of Italy, Romania, Greece and Bosnia Herzegovina within the Hungarian wheat export was between 10 and 25%, respectively. Hungary exported 382 thousand tonnes to Italy, 285 thousand tonnes to Romania, 226 thousand tonnes to Greece, and 192 thousand tonnes to Bosnia and Herzegovina in 2009. Nowadays, the role of Romania in the Hungarian wheat export is very important, because 363 thousand tonnes were exported to Romania in 2008. In 2007, the quantity of the Hungarian wheat export towards Romania was 382 thousand tonnes. However, Hungary

exported 538 thousand tonnes to Romania in 2003. This was the highest level in the last ten years. The reasons are very simple. Romania can produce a sufficient quantity of wheat, but the quality of their wheat is not similar to the Hungarian wheat, because Romania cannot produce sufficient quantity of edible wheat and their wheat is improved by the Hungarian wheat. On the other hand, Romania exported a remarkable quantity of feed wheat every year. This market phenomenon can generate a vacuum on the Romanian wheat market.

There were other important target countries of the Hungarian wheat export in 2009. Hungary exported 164 thousand tonnes to Austria, 75 thousand tonnes to Slovenia, 71 thousand tonnes to Israel, 50 thousand tonnes to Germany. Contrary to Romania, Israel and Germany are quite distant from Hungary.

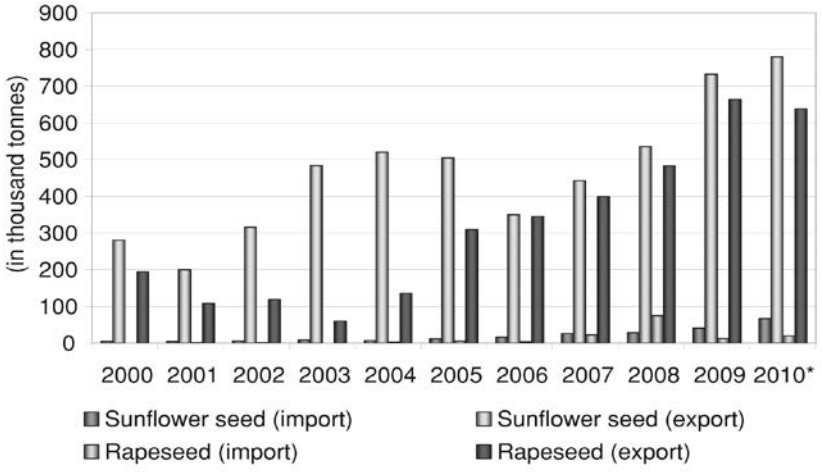

Figure 2: Quantity of the export and import of rapeseed and sunflower seed between 2000 and 2010
Source: FAO and KSH, 2012, *KSH data

We can see that the most important target country of Hungary's maize export was Italy in 2009, when its share was 28% of the Hungarian maize export. However, in 2000 Italy's share was only 1.39%. The Russian Federation was more important, because Hungary exported 119 thousand tonnes to Russia in 2000, but only 3.1 thousand tonnes in 2009.

That is why we can claim that there were significant changes in the rank of the target countries of the maize export. Italy has become the most noteworthy target country after Hungary's accession to the EU. The role of Romania was of the same importance as the role of Italy in 2009. Romania ranked second within the target countries of the Hungarian maize export in this year with 882 thousand tonnes. The position of Romania among our target countries became stronger after Romania's accession to the EU.

There were other important target countries of the Hungarian maize export in 2009. Hungary exported 536 thousand tonnes to Germany, 482 thousand tonnes to Netherlands, 275 thousand tonnes to Austria. The position of these countries among the target countries of the Hungarian maize export became stronger after Hungary's accession to the EU.

3.2. Export-import in oilseeds production

Figure 2 shows the quantity of export and import of rapeseed and sunflower seed between 2000 and 2010. Both of the import of rapeseed and that of sunflower seed are unremarkable in this period. In 2009, the quantity of export was three times as high as in 2000. The export of sunflower seed was 280 thousand tonnes in 2000, but in the next year it went down by 80 thousand tonnes. It increased steadily from 2001 to 2004. In 2005, it dropped again, but this change was not too serious. The export of sunflower seed rose gradually between 2006 and 2009, but afterwards it reached its highest level in 2010.

The export of rapeseed was about 200 thousand tonnes in 2000, but it decreased in 2001. If we look at the quantity of export of rapeseed between 2001 and 2004 then we can state that there was no serious change in this period, but afterwards it improved and there was a sudden increase by the year of 2005. We have to mention that the lowest level of export of rapeseed was in 2003, because of the fact that there was a significant drought in Hungary in this year. This drought affected its yield, but there was another serious reason for this nadir, namely that the Hungarian farmers produced rape only on 70.9 thousand hectares in 2003, which was the lowest level of the last ten years. Nowadays, they produce rape on 200-260 thousand hectares (FAO, 2012). The export of rapeseed increased gradually between 2004 and 2009. The highest level was in 2009. In the next year, it dropped a little bit.

The rape became a very popular plant in Hungary and its harvested area increased gradually from 2004 to 2009. In 2010, it went down a bit. Rape production is quite export oriented. If we look at the quantity of export and the quantity of rape produced in this period then we can state that our country exported more than it produced in 2009, 2008, 2006, 2005 and 2000. It was possible, because there were stocks in Hungary.

We can make similar claims about our sunflower production, but we have never exported more sunflower than we produced. It became a similarly popular plant like the rape due to the fact that the profitability of both sunflower and rape is better than that of cereals.

In our view, the harvested area of sunflower and rape culminated in the last five years in Hungary, because farmers have to follow the technological rules. There are some regulations for crop rotation in the cross-compliance system.

The most important target countries were the Netherlands, Italy and Germany. Hungary exported 264 thousand tonnes to the Netherlands, 174 thousand tonnes to Italy and 120 thousand tonnes to Germany. These countries produce remarkable quantities of biodiesel and they use rapeseed oil for biodiesel production. Due to this consumption, they need sunflower seed oil for human usage.

There were other important target countries of the Hungarian sunflower seed export in 2009. Without listing all, we exported 40 thousand tonnes to Austria, 32 thousand tonnes to Bosnia and Herzegovina, 23 thousand tonnes to Belgium, 21 thousand tonnes to Slovakia, 18 thousand tonnes to Romania, 12 thousand tonnes to France, 11 thousand tonnes to Poland.

Germany was the most important target country. We exported 443 thousand tonnes to Germany in this year. In 2009, the total quantity of the Hungarian rapeseed export was 732 thousand tonnes. We have to mention that the exported quantity to Germany was the highest in 2009. Hungary exported 260 thousand tonnes to Germany in 2008 and 158 thousand tonnes to Germany in 2007. Thus, we can claim that there was an intensive increase after Hungary's accession to the EU.

There were other noteworthy target countries for rapeseed export in 2009. We exported 140 thousand tonnes to Austria, 39 thousand tonnes to Slovakia, 13 thousand tonnes to Netherlands, 12 thousand tonnes to Romania, 10 thousand tonnes to Italy.

To sum up the export-import situation of the most important Hungarian crops, we cannot talk about significant changes in the most important target countries of the Hungarian wheat, sunflower seed and rapeseed export. However, there was a remarkable change in the maize export, because the position of Italy became stronger and the position of the Russian Federation weakened.

3.3. Trade of the other crops in the COP sector

Table 1 shows the quantity of import and export of other crops in the Hungarian COP sector between 2000 and 2010. The other crops are barley, beans, oats, peas, rye, sorghum and soybean.

If we take a closer look at table 1 then we can claim that there were no significant quantities of import of the other crops from 2000 to 2010. The quantity of the import of barley changed between 0.19 and 77.29 thousand tonnes during this period. The import of dry beans varied from 3.7 to 8.47 thousand tonnes. However, the quantity of green beans

Table 1: Quantity of the import and export of other crops in the Hungarian COP sector from 2000 to 2010 (thousand tonnes)

Denomination	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*	
Import	Barley	60.61	50.66	0.19	53.48	77.29	57.39	12.86	65.28	61.08	33.39	77.27
	Beans, dry	3.70	5.33	6.47	7.23	7.97	8.47	7.06	9.05	8.06	7.24	8.35
	Beans, green	0.03	0.00	0.00	0.07	0.01	0.36	0.69	1.32	0.23	0.48	no data
	Beer of Barley	17.97	14.45	22.16	47.73	96.89	78.26	75.90	69.73	82.73	88.01	no data
	Oats	0.00	4.63	0.01	1.10	4.91	0.12	0.15	0.68	1.32	0.06	0.01
	Peas, dry	3.46	5.95	4.95	3.30	1.82	3.27	3.04	3.20	2.37	3.09	5.09
	Peas, green	0.01	0.00	0.01	0.00	0.03	0.03	0.00	0.01	1.44	0.00	no data
	Rye	1.19	0.63	0.03	0.00	2.70	1.18	0.07	1.63	1.80	1.24	0.013
	Sorghum	0.00	0.00	0.10	0.00	0.00	0.12	0.00	0.00	0.39	0.50	no data
	Soybeans	4.90	55.26	54.32	17.01	5.32	11.38	0.56	6.19	13.92	14.42	14.101
	Triticale	0	0	0	0	0	0.001	0.07	0.1	0.053	0.11	0.033
Export	Barley	82.86	139.89	133.49	112.03	126.83	307.90	309.85	363.86	478.59	223.89	501.68
	Beans, dry	0.25	0.05	0.14	0.34	0.15	0.99	1.07	1.93	1.83	1.86	1.21
	Beans, green	0.11	0.04	0.00	0.00	0.06	0.07	0.00	0.00	0.00	0.03	no data
	Beer of Barley	6.31	1.23	2.59	0.85	4.98	34.11	35.67	38.37	53.47	27.50	no data
	Oats	6.02	7.48	8.40	8.03	2.74	9.46	12.63	5.37	5.87	4.05	5.83
	Peas, dry	10.39	8.22	11.16	10.52	12.08	10.88	10.68	13.47	13.26	12.34	9.67
	Peas, green	0.07	0.02	0.09	0.00	0.00	0.14	0.00	0.89	0.51	0.43	no data
	Rye	5.46	7.01	13.27	10.31	4.81	8.56	12.89	12.03	13.92	8.15	10.92
	Sorghum	1.41	0.91	1.28	1.32	1.79	2.24	4.16	6.80	2.61	4.31	no data
	Soybeans	11.09	6.25	5.26	3.29	2.50	6.03	5.73	7.80	11.09	24.82	30.82
	Triticale	12.42	32.83	34.62	17.3	28.78	41.93	38.93	12.52	17.14	16.11	11.57

Source: FAO and KSH, 2012
*KSH

changed between 0 and 1.32 thousand tonnes. The situation of the dry and green peas is similar to that of the beans. Hungary imported rye during this period, but the quantity of the rye is negligible. The volumes of the sorghum, oats and triticale are also unremarkable. Hungary imported from 0.56 to 55.26 thousand tonnes of soybeans between 2000 and 2010.

To conclude, the quantity of the import of the other crops in the Hungarian COP sector is not remarkable. Therefore, we cannot talk about serious competition from import on the domestic crop market. There is import of crops in Hungary either due to special needs or trade policy considerations, or because the foreign crops might be cheaper in a given moment.

We mentioned earlier that Hungarian crop production is export oriented and we introduced the quantities of the export and import of the most important crops in our country. The correctness of this statement was proved. However, we have to talk about the volume of the export of other crops. A remarkable quantity of barley was exported by Hungary. It varied from 82.86 to 501.68 thousand tonnes during this period. The peak was in 2010, when Hungary exported 501.68 thousand tonnes. Barley was the most significant among the other crops in the Hungarian COP sector.

3.4. Competitiveness of the Hungarian COP sector on the World market

Figure 3 shows the carrying costs of the farm crops by modes of transport and destination. Hungarian crops can be competitive up to a distance of 500 km on land. Thus, the most important target countries of our crop export are close to Hungary (POPP, 2009).

On the one hand, the carrying costs impose a very serious disadvantage for Hungary on the international crop market. On the other hand, we have to state that this disadvantage can protect the competitiveness of our crops against imports on the domestic market.

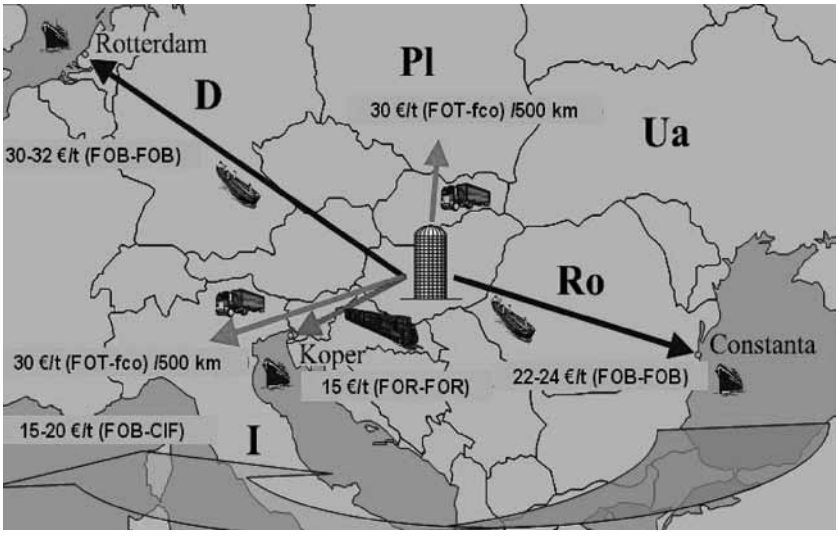

Figure 3: Carrying costs of the farm crops by modes of transport and destination
Source: AKI, IGC in POPP, 2009

3.5. Changes to intervention rules

Firstly, we have to introduce how the intervention rules changed in the EU. It is necessary to make a distinction between the changes that had happened before Hungary joined to the EU and the changes that took place afterwards. Finally, we have to talk about what kind of impacts these changes have on the Hungarian COP sector.

The principal changes between 2000 and 2010 in the EU:

Before Hungary's accession to the EU:

- The intervention prices decreased due to the AGENDA 2000. The prices decreased from €119.19 to €110.25 per tonne in 2000/01 and €101.31 per tonne from 2001/02 onwards.
- In 2003, rye was removed from the scope of intervention and increments were halved monthly.

After Hungary's accession to the EU:

- Quantitative limits were introduced for maize intervention over a three year period. This limit started with a ceiling of 1.5 million tonnes in 2007/08. It was lowered to 700,000 tonnes by the next market year. Finally, the limit was set to zero in 2009/10. The change caused the intervention to no longer be available automatically for maize except when it is necessary due to the circumstances.
- The 2008 CAP Health Check expanded the maize model to other feed cereals. The other very important reform was tendering in the intervention process.

The principal reasons for the reform after Hungary's accession to the EU

"From 2004/05, the EU's maize production increased with the accession of Hungary, along with other new Member States. Intervention became a competitive outlet for Hungarian maize, as prices had formerly been rather low in this landlocked country. A phasing out of maize intervention was therefore decided in 2007" (European Commission, DG Agri, 2011).

"Poor harvests, tight supplies and high EU prices resulted in intervention stocks being cleared in 2007/08. However, following a bumper harvest in 2008/09 they built up again, with low prices resulting in large quantities of barley being offered to intervention. Higher prices in 2010/11 allowed stocks to be cleared again" (European Commission, DG Agri, 2011).

3.6. The impacts of the changes on the Hungarian COP sector

Figure 4 shows the monthly quantities of the intervention closing stocks from December, 2004 to July, 2011. At first glance,

it seems evident that the quantities of the closing intervention stocks reached the highest point within two years after the EU accession. Even so, this situation is not as simple as it seems at first sight. We have to take a closer look at the reasons for the high closing stocks in this period. On the one hand, the intervention system was treated by the Hungarian farmers as if it had been a fixed market with fixed prices. Due to this kind of thinking, the Hungarian intervention stock was the highest in the European Union. On the other hand, this is not the real reason for the high stocks, since the maize yield was quite good from 2004 to 2006 and the farmers could not sell their maize because of the fact that Hungary is a landlocked country and the Hungarian farmers could not be competitive with their crops due to their higher carrying costs. Therefore, they offered their crops for intervention.

We can see that the two most important cereals in the interventions stocks were wheat and maize. In addition, there is also barley and sorghum, but these crops were not so noteworthy.

The quantity of the wheat increased rapidly from December, 2004 to July, 2005. In less than one year it had increased by 1.391 million tonnes. There was a little stagnation of the quantity of the wheat from July to December, 2005, but afterwards it increased steadily again and it peaked in May, 2006. The quantity of 1.821 million tonnes of the Hungarian intervention wheat stocks was the highest since Hungary's accession to the EU. Thereafter, the volume of the wheat decreased constantly from May, 2006 to April, 2008.

We can talk about similar things in the case of maize. The quantity of maize increased sharply between December, 2004 and July, 2005. In 2005, the intervention maize stocks stagnated from July to November, but afterwards the increase persisted due to the new heavy crops. The highest quantity of maize was the 5.201 million tonnes that was achieved in June, 2006. From then, the volume of the maize decreased steadily to October, 2008.

The quantity of barley and sorghum was negligible as compared to the volume of the two most important Hungarian cereals. The quantity of barley changed between 0 and 367.329 thousand tonnes during this period. The intervention stocks of sorghum varied between 0 and 2.945 thousand tonnes.

If we take a closer look at how the quantities of the intervention closing stocks developed, then we can claim that the total intervention stocks decreased steadily from its highest point to October, 2008 due to the following two reasons. Firstly, there was a serious drought in Europe and there was need for the Hungarian intervention stocks in the EU, and Hungary exported a remarkable quantity of its intervention stocks. The other reason for the decrease was that there were some principal reforms to the intervention system; therefore the European Commission did not buy more quantities of the crops.

Figure 4 also shows distinctly how the principal reforms of the intervention system affected the Hungarian cereal sector. One can see that after the reforms the total quantity of the intervention closing stocks could not reach the level of one million tonnes again in spite of the fact that before the reforms the total closing stock reached the level of seven million tonnes.

On the one hand, the stocks decreased due to the reforms. Therefore, the contracted capacities of intervention cereal stores decreased also. Figure 5 confirms this statement by showing the contracted capacities of intervention cereal stores according to counties between 2004 and 2011. In the 2004/05 marketing year, there were around 4.2 million tonnes of contracted capacity. In 2005, the total intervention closing stocks were around 4 million tonnes.

However, the contracted capacity exceeded 11 million tonnes by the marketing years of 2005/06 and 2006/07. The reasons for this increase are perfectly clear, since the intervention closing stocks increased also during these years. Due to the incremental stocks, it was necessary to build new cereal storages in Hungary. The investments were undertaken by the private sector. Conversely, there were subsidies for these buildings. The most of the investors were traders, integrators and other huge actors of agribusiness. Contrarily, there were only few investors among the Hungarian farmers, because they had no good contacts and faced a lack of capital and abilities.

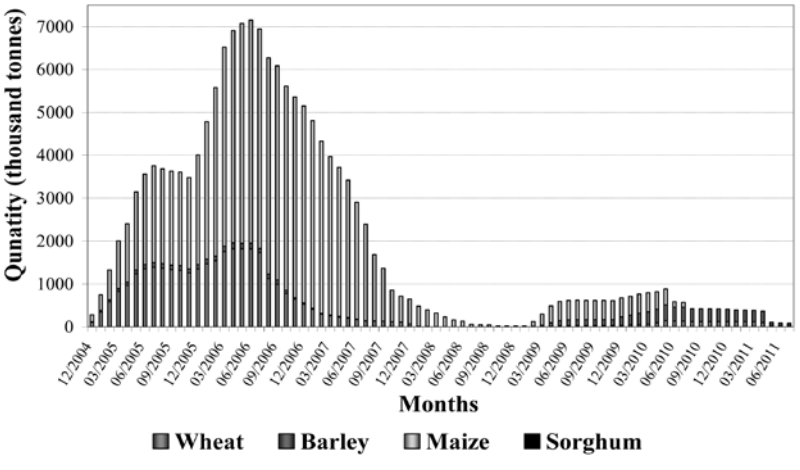

Figure 4: Monthly quantities of intervention closing stocks between December, 2004 and July, 2011
Source: MVH, 2012

The contracted capacity decreased dramatically by the marketing year of 2007/08, because of the principal reforms. Thus, it was not necessary to contract for cereal storage. The contracted capacity varied between 1,221 and 1,661 thousand tonnes. After the reforms, we cannot talk about significant changes in this question.

When the new storages were built up there were sufficient quantities of crops to take advantage of these new capacities. Nowadays, the capacity utilisation is not so favourable due to the fact that there were some changes in the intervention system. Therefore, the intervention closing stocks cannot reach again the previous levels and most of these stores

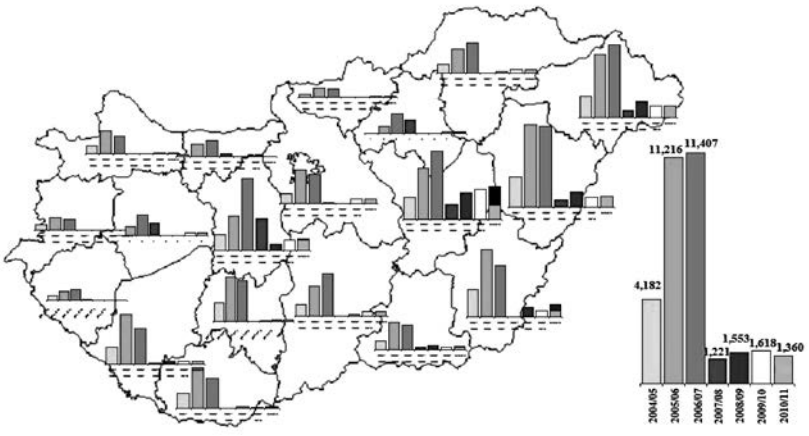

Figure 5: Contracted capacities of intervention cereal stores according to counties from 2004 to 2011 (thousand tonnes)
Source: MVH, 2011

are empty or have a low level of utilization. Figure 6 shows the capacity utilisation of intervention cereal stores according to storages in 2010. We can see on this figure that the previous statement is correct. It can be a serious problem, because if we do anything as an entrepreneur or enterprise in the sphere of business then we have to press down the fixed costs of the product as low as possible. We can reach this objective with good capacity utilisation. If our storages are empty or have a low level of utilization, we cannot press down our fixed costs enough.

However, we have to distinguish between flat storages and tower silos in this question, because the flat storages can be used in alternative ways. The investors can store different things in flat storages, but they can store only cereal in tower silos. Due to the alternative utilization of flat storages, these stores have good capacity utilisation.

Figure 6: Capacity utilisation of intervention cereal stores according to storages in 2010
Source: MVH, 2011

Finally, we would like to emphasize that there was a quite positive impact from the changes to the intervention rules. Earlier, the farmers offered their crops for intervention, and the intervention price was 101.31€per tonne. Afterwards, the market prices improved and the EU sold the intervention stocks on the market. The price difference meant profit for the EU. After the reforms, the farmers could not offer their crops for intervention and they had to learn to adapt to the changes of the market environment. Due to the reforms, the adaptability of the Hungarian farmers improved and the price difference was realised in the Hungarian economy.

4. Conclusion

The authors can claim that the Hungarian cereal production is rather export oriented, due to the fact that Hungary produced more quantity than the domestic consumption in the examined period. Hungary exported remarkable quantity of cereal and oilseed between 2000 and 2010, however the competitiveness of our crops is limited because Hungary is a landlocked country without a seaport. The Hungarian crops can be competitive up to a distance of 500 km on the land (POPP, 2009). Thus, the most important target countries of our crop export are close to Hungary.

In the examined period the intervention rules were changed some times by the European Commission. "From 2004/05, the EU's maize production increased with the accession of Hungary, along with other new Member States. Intervention became a competitive outlet for Hungarian maize, as prices had formerly been rather low in this landlocked country. A phasing out of maize intervention was therefore decided in 2007" (European Commission, DG Agri, 2011). The quantities of the closing intervention stocks reached the highest point within two years after the EU accession. The authors examined the reasons of this situation. On the one hand, the intervention system was treated by the Hungarian farmers as if it had been a fixed market with fixed prices. Due to this kind of thinking, the Hungarian intervention stock was the highest in the European Union. On the other hand, this is not the real reason for the high stocks, since the maize yield was quite good from 2004 to 2006 and the farmers could not sell their maize because of the fact that Hungary is a landlocked country and the Hungarian farmers could not be competitive with their crops due to their higher carrying costs. Therefore, they offered their crops for intervention.

After the reforms, the farmers could not offer their crops for intervention and they had to learn to adapt to the changes of the market environment. Due to the reforms, the adaptability of the Hungarian farmers improved and the price difference was realised in the Hungarian economy.

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NETWORK ATTRIBUTES' EVALUATION BY STAKEHOLDER GROUPS CONCERNED TO THE AGRI-FOOD SECTOR IN HUNGARY

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Abstract: As a consortium partner, University of Debrecen, Hungary, has been conducting a European four-year project with the acronym NetGrow financed within the Framework Program 7 under the auspices of the EU focusing on network behaviour of food SMEs and the performance of networks. The overall objective is to reveal more evidences and facts on innovation, learning, and networking in the food sector of the EU. Whithin the scope of the project, special attention was paid to reveal how network attributes were evaluated by the main four stakeholder groups of the food sector such as food SMEs, public bodies, research institutions, and network management organisations. The respondents differ in ranking the attributes, while but we got a clear order of attributes, of which the top five can be explicitly selected. Taking the next three ranks into consideration, the attributes behind them have clear meanings and they seem to be complementary for the top five. The stakeholder groups were significantly differ in scoring open-mindedness and external relations, the importance of network rendered services, and the goals relevance of the network to the firms.

Keywords: agri-food sector, innovation and learning, network, attributes, evaluation

Introduction

As a consortium partner of universities and research institutions throughout Europe, University of Debrecen, Hungary, has been conducting a European four-year project with the acronym NetGrow financed within the Framework Program 7 under the auspices of the EU, which seeks to enhance the network behaviour of food SMEs and the performance of networks. Within the NETGROW project, which has the objective to contribute to the innovativeness of food SMEs through revealing the strategic network behaviour and network learning performance, one of the tasks is to identify the network attributes which are relevant in prompting network learning and innovation among agri-food SMEs, and to identify of their associated levels.

Experienced network management can be more confident respondents of the field of networking than those of concerned by a specific field or aspect of it. For the business partners such as food SMEs, this level of examination seems to be too abstract, thus they might be rather aware of network operation than comprehensive evaluation. The less abstract issues can go to business partners, but only if they are touched upon. Felföldi et al. (2013) focused on the personal consistency in scoring network attributes from the angle of learning and innovation that resulted in a more confident organisational 'expert' group such as the network managers. Of the stakehorlder groups, the food SME firms were less consistent in their scores for the most important characterisitcs of networks that contribute most to learning and innovation in networks. This draws the attention to the importance of network management in order to evaluate performance or factors influencing networking.

The overall objective is to reveal more evidences and facts on innovation, learning, and networking in the food sector of the EU. Within the scope of the project, special attention was paid to reveal how network attributes were evaluated by the main four stakeholder groups of the food sector such as food SMEs, public bodies, research institutions, and network management organisations. We presume that they differ in evaluating the importance of those attributes. Doing so, they provide us with different ranks and we can identify some of those attributes preferred by a speicifc stakeholder group.

Material and methods

The identification of relevant network attributes was done by a selection process by Bologna University (UNIBO), Italy and LaSalle Beauvais Polytechnic Institute (LAS), France through the review of the relevant literature, and through the data collected during the plenary brainstorming session held in Bonn in June, 2011. Stakeholders from the triple helix coming from the partners' countries and some international experts were involved in the brainstorming session to classify those many attributes arisen. The basic methodology was developed by UNIBO together with Ghent University (UGENT), Belgium. A professional facilitator was in charge

of the direction of the plenary brainstorming session, and the results were mapped out graphically by a visual facilitator. A provisional list of attributes emerged, and the results were analysed by project partners UNIBO and LAS, and compared with the attributes emerged from the literature review.The major objective of this task was to focus on the identification of the twenty most important attributes for network innovation for the SMEs at international level.

Not to neglect the national experience within the consortium, there was a brainstorming session held by the NETGROW partners, running with the participation of a group of external national experts, where the business component was represented by food SMEs managers. It is aimed at identifying the list of attributes and related levels, according to a national perspective. A common procedure was used in each participating country, and it was intended to encourage the elicitation of an independent list of attributes from the experience of the participants, rather than asking general statements or commenting pre-defined list of attributes (e.g. the general list of attributes developed in Bonn).

Most of the attributes were alike than those selected in the sessions held by cosortium partner countries (Belgium, France, Hungary, Ireland, Italy, Sweden), at least in the possibility to group them according to macro-areas. Moreover, the emerged attributes are also consistency with those obtained from the plenary brainstorming session in Bonn.

The identification of the attributes levels was satisfactory, but their listing and definition at the national level resulted less consistency and with different levels of detail and operationality for the different attributes. In particular, while some attributes' levels may be quantified through measurements, others are mainly qualitative ones.

In conclusion, the application of the brainstorming methodology in the six Netgrow partners involved helped to reach our objective, the identification of the list of attributes, their levels and their definition. These results provided useful insights for the following step taken in Netgrow project, the organization of the Delphi rounds, which would lead to a ranking of the current list of attributes and to the final identification of the most relevant ones, while revealing the relationship among them by respondent groups.

We set two hypothesis, namely:

H1: An order of attributes can be set and the most important five-plus can be identified by using the ranks

H2: Group preference of some attributes does exist that can be identified to a specific respondent (stakeholder) group

Description of the data

During the NETGROW brainstorming session, the experts identified a list of 37 attributes relevant for SMEs networking and innovation, later we reduced this attributes to 12. Then, these attributes were grouped and then ranked (through dots) by the participants, which were asked later to define the characteristics of the most voted ones. In the following table *(Table 1.)* presents the 12 selected variables for the analysis. In the second column of the table we can read the definitions of the selected variables (or attributes).

Table 1: Selected variables to evaluate and its definitions

1.	Degree of internal information openness	Degree to which information is shared openly with members within the network
2.	Clearness of goals	Degree to which the goals of the network are clearly defined
3.	Main services provided by the network	Type of preferred services provided by the network
4.	Type of members	Composition of the network in terms of the type of members (e.g. other firms, advisors, etc.)
5.	Relevance of network's goal for the firm	Degree to which the network's goal is relevant for the firm
6.	Presence of common values and willingness to collaborate	Degree to which the members of the network share common values and a willingness to collaborate
7.	Variety of industry sectors	Specificity of network's focus with respect to the food sector
8.	Degree of commitment by members	Degree of commitment by members of the network towards the network and other members
9.	Linkages to other networks or institutions	Linkages of the network/its members to other networks or institutions
10.	Diversity and open-mindedness	Degree to which the members of the network show/value diversity and open mindedness
11.	Representativeness of the network with respect to the sector	Degree to which the network covers the full sector
12.	Type of food sector of the members	Desired composition of the network in terms of the homogeneity/heterogeneity of the sectors the members represent

Source: Netgrow, 2011

After having the 12 important attributes to evaluate, 34 experts of Hungary, only those of concerned by their institutional basis, were involved in the evaluation, representing four stakeholder groups such as food SMEs as business partners, public bodies, research institutions, and network management organisations *(Table 2.).*

Table 2: Respondent category

Groups of respondents (stakeholders)		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	network management	7	20,6	20,6	20,6
	food SME (business partner)	10	29,4	29,4	50,0
	research institution	10	29,4	29,4	79,4
	public body	7	20,6	20,6	100,0
	Total	34	100,0	100,0	

Source: own

Method of analysis

The method of paired comparisons has a long history, originating in the field of psychophysics. Within psychology it is most closely associated with the name of Louis Thurstone (1959), an American psychologist working in the 1920s–1950s who showed how the method could be used to scale non-physical, subjective' attributes such as 'perceived seriousness of crime', or 'perceived quality of handwriting' (Bramley-Oates 2010).

In practice, the paired comparison method typically is very demanding – it can be extremely resource- and time-intensive. The issue for its deployment depends not least on reaching a judgment regarding its benefit-effort ratio in a specific context (Novakovic and Suto, 2010). In an effort to increase the efficiency of the process, Bramley (2005) showed how the same principles could be used to create a scale if the experts were asked to put several objects into a rank order rather than comparing just two. Using rankings of several objects allows many more comparisons to take place in the same time, with the advantage of allowing whole mark scales to be linked, rather than just grade boundary points (Bramley-Oates 2010).

To get a clear view for each of the attribute combination scores, we used a preference matrix for each respondent. This matrix includes each decision on paired attributes that the individual experts made. In the rows and columns of the matrix we can see that different attributes (a1-a12) to be compared. During the comparison procedure the experts has to compare for instance the a1 with the a2, but later they have the opposite comparison, like a2 with 11. It is the same decision but in another way, to test the experts confidences. The diagonal of the matrix does not mean anything (with same attribute comparison) so the value of the diagonal matrix will be neutral. Finally we calculate the sum of the individual rows and columns that go to a cumulative score matrix. Having that we used the cumulative attribute score matrix to get the rankings by each stakeholder group.

To meet this paper objectives, we run a test (Kruskall-Wallis H) for several independent samples to reveal relations between stakeholder groups and the attributes assessed. Following this, we made paired comparisons by stakeholder groups based on the significance values for each attributes. Obviously, we made the comparisons in the case of those network attributes of that significance values were less than 0,1. In general this level value is maximum 0,05, but we paid attention to those all not higher than 0,1 in order not to neglect some information.

Results

Because the 34 experts represented from different fields like SMEs, public body, research institutions and network management organisations, their different orientations show different preference systems with different point of views. But we got an overall picture showing that there is some common orientation representing a pattern of attributes' importance.

From the cumulative attribute score matrix we can compute the aggregate order of the different attributes, which is applied together with the mean ranks. Thus, we could create the verified order of the important attributes.

After having gained the attributes' order of importance for a network to innovate for the agri-food sector, we could select the most important five ones and separate another three, which were judged by their mean ranks, were considered belonging to the first five rather than the last one-third of the attributes in rank.

In *table 3* we can read the attributes orders of importance by expert groups and totalled up. We have to highlight the "relevance of network goals for the firm", "clearness of goals", "degree of internal openness", "presence of common values and willingness to collaborate", and "main services provided by the network" as they are the top five. The next three are complementary for those of five, thus they together make up the relevants representing the 2/3 of the total dozen.

Based upon the values of Kruskal Wallis H *(table 4.),* we must analyse relations between stakeholder groups and attributes named "Diversity and open-mindedness", "Linkages to other networks or institutions" as it is justified by significance. Paralell with that we found that it makes sense to reveal relations between stakeholder groups and attributes named "Main services provided by the network", "Relevance of network's goal for the firm", since significances suggest that these are not so low values to reject the null-hypothesis, although the pure values mean that we should do so.

Conclusions

A preliminary list of 37 attributes stemmed from NETGROW were applied and reduced to 12, so 12 attributes were assessed. Experts (only those of concerned by their institutional basis) were involved (34 of Hungary), representing four stakeholder groups such as food SMEs, public bodies, research institutions, and network management organisations. They were selected respecting the rules that a respondent had to be a stakeholder concerned in innovation related organizations and actions by agri-food sector players.

As a result of the survey we got a clear order of attributes, of which the top five can be explicitly selected such as "relevance of network goals for the firm", "clearness of goals", "degree of internal openness", "presence of common values and willingness to collaborate", and "main services provided by the network". Taking the next three such as "linkages to other networks or institutions", "degree of commitment by members", and "diversity and open-mindedness" into consideration, these attributes also have clear meanings and they seem to be complementary for the top five.

The most important attribute for a network to innovate is the degree to which the network's goal is relevant for the firm that is or would be a member of the network. The second one suggests more accuracy, referring the specificity and the clear definition of the goals set. The third one is the degree to which information is shared openly with members within the

Table 3. Attributes by order by expert groups

Order	Network management	Research institution	Public body	Business partner	Aggregate
1	Degree of internal information openness	Relevance of network's goal for the firm	Relevance of network's goal for the firm	Relevance of network's goal for the firm	Relevance of network's goal for the firm
2	Clearness of goals	Presence of common values and willingness to collaborate	Presence of common values and willingness to collaborate	Degree of internal information openness	Clearness of goals
3	Presence of common values and willingness to collaborate	Diversity and open-mindedness	Main services provided by the network	Clearness of goals	Degree of internal information openness
4	Linkages to other networks or institutions	Clearness of goals	Clearness of goals	Main services provided by the network	Presence of common values and willingness to collaborate
5	Relevance of network's goal for the firm	Degree of internal information openness	Degree of internal information openness	Presence of common values and willingness to collaborate	Main services provided by the network
6	Main services provided by the network	Degree of commitment by members	Degree of commitment by members	Degree of commitment by members	Linkages to other networks or institutions
7	Type of members	Linkages to other networks or institutions	Type of members	Linkages to other networks or institutions	Degree of commitment by members
8	Type of food sector of the members	Variety of industry sectors	Representativeness of the network with respect to the sector	Diversity and open-mindedness	Diversity and open-mindedness

Source: own

Table 4: Test statistics

	Degree of internal information openness	Clearness of goals	Main services provided by the network	Relevance of network's goal for the firm	Presence of common values and willingness to collaborate	Degree of commitment by members	Linkages to other networks or institutions	Diversity and open-mindedness
Chi-Square	1,065	4,270	7,425	6,987	3,848	2,712	8,357	12,594
df	3	3	3	3	3	3	3	3
Asymp. sig.	0,786	0,234	0,060	0,072	0,278	0,438	0,039	0,006

a. Kruskal Wallis Test , b. Grouping Variable: Respondent category. Source: own

network, whatever is that information. So, the focus might be on the "sharing" among the members. Presence of common values and willingness to collaborate is the next as an attribute of importance that is in line with the former one as common values and willingness to collaborate help with sharing. As members of a network organisation all stakeholder expect services "rendered" by the network as an organisation. They have their own expectations, which are rather general than specific, although, the services must have the potential to meet their needs. Those following the top five are the completing three that stress upon the degree of commitment by members of the network towards the network itself and other members, while the micro-environment is considered necessary as other networks or institutions and the degree to which the members of the network show/value diversity and open mindedness.

The stakeholder groups were significantly differ in scoring open-mindedness and external relations, the importance of network rendered services, and the goals' relevance of the network to the firms.

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INTEGRATED AGRIBUSINESS IN THE DAIRY INDUSTRY OF UKRAINE: MAIN CHARACTERISTICS AND SUCCESS FACTORS

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Abstract: Ukraine belongs to the TOP 20 global producers of milk. Despite its position, the Ukrainian dairy industry is suffering from a permanent deficit of raw milk supplied for processing. on average, in 2007–2011 over half of the produced raw milk did not reach the processors. one of the reasons behind this lasting trend is that the structure of initial production of raw milk is dominated by households (having a share of 80%); the latter produce milk mostly for their own consumption and leftovers are sold at marketplaces where they can get more attractive prices. nevertheless, already today we observe results of largescale investments into the industrial production of milk made in the last few years.

This article stresses an important place of the dairy industry in the agriculture of Ukraine, as it provides the population of vital food products, many of which are strategic in the export potential. Authors present essential characteristics of the concepts "agro-industrial integration" and "agroholding", discloses their role and place in the agrarian sector of the economy, and justifies the necessity of the creation an integrated production in the Ukrainian dairy sub-complex. The study aims at identification and description of latest trends in Ukraine's dairy market. Moreover, authors present a successful Ukrainian example of Milkiland N.V. as one of the TOP 5 players in the Commonwealth of Independent States (CIS) dairy market.

Keywords: agroholdings, dairy industry, integrated farms, dairy products, Mililand

1. Introduction

Ukraine, being a large European economy, has an all-developed industrial base, the rich farmlands, highly trained labour and a good education system. The country possesses a massive high-tech industrial base, including electronics, arms industry, space program and is a major producer of grain, sugar, meat and milk products.

The crisis on international food markets has raised a special attention of experts and business circles towards Ukraine, which is one of few countries that have significant potentials to increase productions of agricultural outputs. Meanwhile, the national farm sector is being affected by some dramatic changes the scale of which can be compared with the reforming of collective farms in the middle 1990s. Producers of milk, manufacturers, and vendors had to overcome the problems connected with a deficiency of financial assets and raw materials, with non-payments, with a decrease of purchasing capacity of the population, with an adverse conjuncture of the world dairy market. Speaking about these changes we mean, first of all, the formation of vertically and horizontally integrated agricultural holdings, which are already present on leading European financial markets and which have already began a hallmark of the national farm sector.

Some other changes relate to global economic processes: in 2008 Ukraine became a member of the World Trade Organization (WTO). On the other hand, undoubtedly, the financial crisis and global corrections on stock and commodity markets impact the farm sector in Ukraine and particularly its dairy industry. These changes will be tangible both on the macro and micro levels. In these conditions, one may be curious to know: What is the present state of the Ukrainian dairy industry, and what kind of changes the sector should be expecting in the futures? This study is aimed at addressing these issues.

2. Materials and research methods

The dairy industry takes an important place of the dairy industry in the agriculture of Ukraine, as it provides the population of vital food products, many of which are strategic in the export potential. Milk is our first food, and provides the basic building blocks for good health, with lifelong benefits.

People know that the calcium in milk helps to build and maintain strong bones and teeth. Milk and dairy products are the richest source of calcium.

Research has identified more than 100 different components in milk. Evidence is mounting that consumption of milk and dairy products may reduce blood pressure, dental cavities and the risk of cancer, while enhancing bone strength and immunity. The global demand for dairy products today is much larger than supply and Ukrainian producers have a real chance to occupy substantial niche of this global dairy market.

The modern state of integration processes in agro-industrial sub-complex and the prospects of their development in market conditions have been attracting the attention of many researchers. Among them there are such Ukrainian scholars as V. Andriichuk, P. Berezivskyy, S. Vasylchak, P. Gaydutskyy, T. Dudar, V. Zinovchuk, M. Ilchuk, M. Malik, P. Sabluk and others. Among the foreign scientists we should call I. Ushachov, I. Minakov, G. Hokman, and D. Hay.

According to these scientists (*Kobets* 2007), large integrated farms are the most perspective organizational forms of management because of their ability to combine the production, processing and marketing of the agricultural products, to use new technologies that are financially unable to afford for another enterprise's types, to minimize transaction costs, and to optimize the taxation.

In this paper we discuss the major bottlenecks in the dairy sector known in the literature and expressed by the sector players. Also we summarize the main results of the recent empirical studies done on the dairy sector of Ukraine. However, according to the last years' features and trends of the agro-industrial integration in the dairy sub-complex, some approaches require the deepening and adaptation to the modern realities in the specific light of joining Ukraine to the World Trade Organization (WTO).

3. Results and discussion

This chapter is dedicated to the short overview of Ukrainian agrarian sector. The strong emphasis is made on the dairy industry with focusing on integration processes in it. Authors present a successful Ukrainian example of Milkiland N.V. as one of the TOP 5 players in the Commonwealth of Independent States (CIS) dairy market.

3.1. Agrarian Sector of Ukraine

Agrarian business in Ukraine is one of the few sectors of the economy that successfully survived global economic crisis of 2008–2009 years. Agricultural output has practically not diminished as compared to pre-crisis level, and the latter is going to be surpassed already in 2011, with moderate growth in livestock sector and relatively good harvest of main crops.

Over the last year, there have been remarkable changes in Ukraine's agriculture. Increase of intensity of production, re-orientation towards more profitable crops and commodities, expansion to foreign markets, development of agrarian holdings and attraction of investments on international stock markets – all these contributed to turning of Ukraine's agriculture into the most attractive sector of the economy.

The year of 2011 may be featured as a period of post-crisis growth in Ukraine. Compared with 2010, when gross domestic product (GDP) gained 4.2%, in 2011 GDP growth made up 5.2%. The agrarian sector contributed heavily to this positive trend: growth of gross output of agricultural production amounted to 17.6% as compared with 2010. This impressive level of growth was, to a large extent, explained by the record harvest of cereals.

During 2011 the share of the agrarian sector in GDP also increased, from 7.6% up to 8.3%, following the trend of recent years of featuring steady enlargement of the share of agriculture in gross value added. Stability of prices and tariffs facilitated a low level of food prices inflation in 2011. Another important reason for low consumer price index was the high yield of grain crops and horticultural products due to very favorable weather conditions.

The best evidence of sector's development is the fact that it increased its output by 27% (starting from 2000) without expansion of crop areas (see *Figure 1*). At the same time, low productivity, outdated physical infrastructure and technologies, lack and high cost of lending resources, ineffectiveness of management and state agrarian policy missing predictability have prevented stable growth at high rates.

And now let focus on the efficiency of livestock farming. As we may see in *Figure 2,* efficiency of production of main types of animal products in Ukraine is quite poor. The only exception is made by aviculture (poultry meat and eggs) where production is concentrated mostly on farms employing

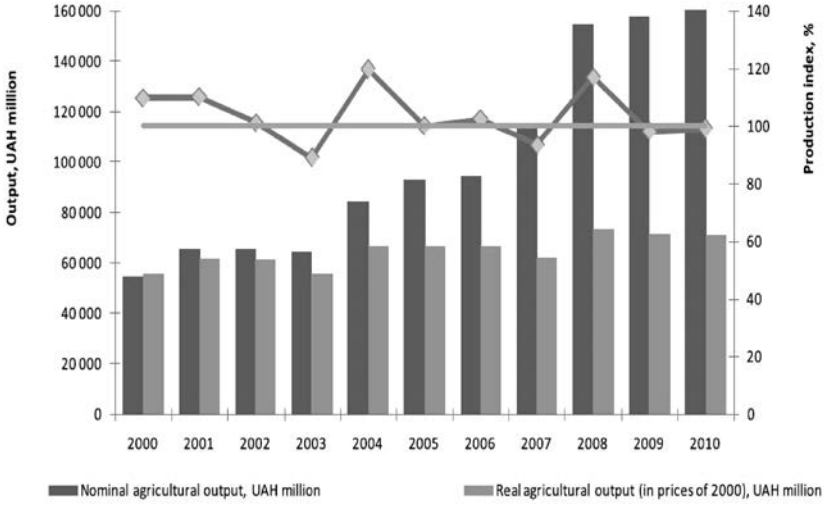


Figure 1: Gross agricultural output of Ukraine, 2000–2010
Source: State Statistic Service of Ukraine

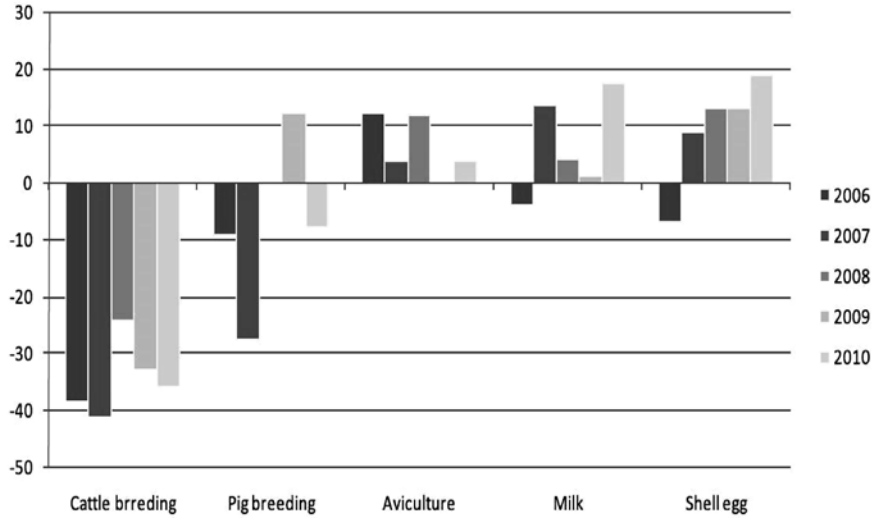


Figure 2: Profitability of livestock breeding at agricultural enterprises of Ukraine, %
Source: State Statistic Service of Ukraine

high technologies. Production of milk due to a deficit of milk on the Ukrainian market reported certain profitability but, due to inseparability of efficient dairy production with inefficient rising of young cattle, the overall result of dairy farms is mostly negative.

Poor genetics of pigs, imbalanced feed, low efficiency of labour are key drawbacks of Ukrainian pig breeding sector which, combined with deterioration of prices for pigs on the domestic market, have driven the sector back at running at a loss. Only few farms, employing the most advanced technologies, look into the future with confidence.

3.2. Overview of Ukrainian dairy industry

According to United Nations Food and Agriculture Organization (FAO), global dairy market has one of the most upward growth potential the total food market. The key growth drivers are demands from Asian countries, Russia, Ukraine and Belarus. In 2011, global dairy production reached 728 million tons, representing a 2% increase over 2010. Most of the increase comes from developing countries, in particular Argentina, China and India. At the same time, import demand grew 5.4% to 49.5 million tons. Growing world population puts a challenge for world milk production.

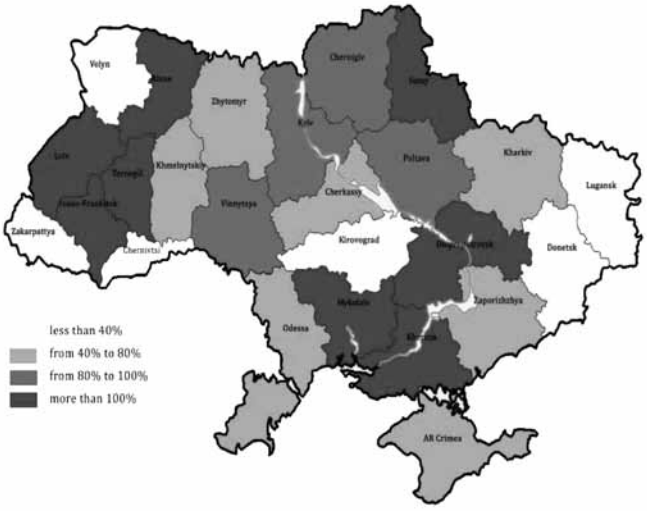
As for the Ukrainian dairy industry, it is based on "three whales", or three main directions of activities: whole milk output, cheese, and butter (plus milk powder and casein). Cheese and butter are the most raw stock consumption intensive products, though whole milk output is considered to be the most important, because it is a staple commodity. Steady rise in the production volumes of practically all major dairy products is observed in Ukraine regardless of the commodity importance. The production of some goods increased several times lately with the most significant increase seen for cheese.

Annual milk yield during the Soviet era in Ukraine was over 20 million tons, and the industry's reorganization has yet to regain these heights. With such potential, Ukraine could have been an absolute leader of milk procurement in Europe. The disastrous reduction in livestock herds and decrease in dairy herd productivity since independence played havoc on the sector. As a result, only 12,6 million tons of milk were collected in 2000 that was half of 1990 year index. However, the situation started to improve in the end of 1990s. Milk production volumes in Ukraine stabilized at the level of 13,7–13,8 million tons over recent years. The slide in milk production stopped because of yield in family farms. Meanwhile, milk yield in commercial agricultural farms dropped many times.

Long-lasting invariably downward trend in dairy sector – in terms of population of cows and in terms of milk production – has already led to the situation when deficit of milk for industrial processing became very acute. However, if one looks at official statistics on production of milk in households and on corporate farms and compares them with data on industrial processing by regions, it turns out that all regions do have excess of milk. But in some regions, like Mykolayiv, Kherson, Kyiv, Cherkasy, Poltava and Sumy regions, competition of processors over milk may be more acute as the share of supply for processing accounts for 60%.

At the same time, if we look at production and processing of milk originating from agricultural enterprises, taking into account that the later are constantly increasing supply, we will conclude that demand for milk from agricultural enterprises is significantly exceeding output in some regions (see *Map 1*).

Despite the fact, that Ukraine belongs to the TOP 20 global producers of milk, the Ukrainian dairy industry is suffering from a permanent deficit of raw milk supplied for processing.



Map 1: Share of milk supplied for processing by agricultural enterprises, % of the total production, 2011
Source: "Ukrainian Agribusiness Club"

On average, in 2007–2011 over half of the produced raw milk did not reach the processors.

At that, agricultural enterprises are undergoing essential structural changes. So, the group of enterprises with an annual output below 2 thousand tons is reporting reduction of production while large farms are reporting increase of milk output by 8%. Unfortunately, achievements of the later group could not make up for failure of the former.

One of the reasons behind this lasting trend is that the structure of initial production of raw milk is dominated by households (having a share of 80%); the latter produce milk mostly for their own consumption and leftovers are sold at marketplaces where they can get more attractive prices. Nevertheless, already today we observe results of largescale investments into the industrial production of milk made in the last few years.

It is necessary to mention that in 2011 there were 22 agroholdings with an annual production of milk exceeding 5 thousand tons at each of them (medium and large independent producers are not taken into consideration) (*Statistic Yearbook "Agriculture of Ukraine 2011"*). Their share in the overall milk output (only agricultural enterprises) accounted for 18.1%. Besides farms belonging to holdings, there were 30 independent producers with the same scale of production. Their market share slightly exceeded 13%. The trend toward enlargement and concentration has been irreversible throughout the last years.

Among positive trends, there is also an increase of the share of milk of extra quality in the overall output of agricultural enterprises (large and medium producers are those having gross annual yield of milk at the level of 10 and 5 thousand tons respectively); it accounted for 7.4% in the first quarter of 2011 (against 4% in the same period of 2010). But most milk is still supplied as milk of high (35.1%) and first (53.8%) grade. At that, households manage to supply mostly milk of the second grade (63%); less than 1% is qualified as extra quality milk.

Lack of long-term strategy for the development of dairy sector and production of milk, missing state programs for support of implementation of the said strategy along with volatility of prices, absence of long-term contractual relations between producers and processors and poor culture of discharge of contractual obligations are pushing processors towards investments into milk production. Investment projects are not limited to traditional advanced payments, provision of interest-free loans and compensation of interest rates; they also include construction of new livestock breeding complexes and establishment of servicing cooperatives in the private sector etc.

According to results 2011, 11,1 million tons of milk were produced in the country (see *Table 1)*. The dairy industry of Ukraine totals over 450 enterprises, but recently only about 250 dairy plants/ enterprises really process large volumes of milk (over 6 million tons). But from the market and macroeconomic perspective, 2011 was challenging to CIS dairy processors. The upward pressure on costs and unfavourable macroeconomic trends tested their margins.

First of all, Ukraine is a netexporter of dairy products, supplying annually 1 million tons thereof in terms of milk. Naturally, Ukrainian dairy producers are looking at world prices in order to stay competitive on the global market. Besides, from 2005 and on there have been so-called "cheese wars" going on between Ukraine and Russia, the latter is the main trade partner of Ukraine in respect to dairy products. Due to the embargo that is from time to time imposed by Russia on import of Ukrainian dairy products, some volumes of milk meant for the Russian market exert pressure on the domestic market.

Secondly, the milk segment is highly sensitive to any changes in the system of state support and regulation. The scheme of support of milk producers changed twice between 2010 and 2012. The Tax Code of Ukraine adopted in December 2010 provided for subsidies paid per cattle's head; a year later, in December 2011, The Tax Code was altered and former system of support was restored. Experience shows (and not only Ukrainian), that the most effective schemes are those that support the whole supply chain.

So, the mutual relationship among partners in dairy products sub-complex covers all the stages of manufacturing final produce, at all levels: management, organization, production, transportation, processing, storage and selling. Causes, contents, scope, functioning and the task of relationships allow to distinguish three basic types among them: production, organizational and financial (*Butko* 2010).

Table 1: Ukrainian Dairy Sector, 2007–2011

Indicators	2007	2008	2009	2010	2011
Milk yield, all producers, million t, including:	12,3	11,8	11,6	11,3	11,1
households, million t	10,1	9,7	9,4	9,1	8,8
agricultural enterprises, million t	2,2	2,1	2,2	2,2	2,3
Milk passed by industrial processing facilities, million t, including:	6,2	6,3	6,9	6,5	6,4
feeding, losses and other uses of milk, million t	1,2	1	1,1	1,1	1
own consumption of households and sales at marketplaces, million t	5,1	5,3	5,7	5,4	5,3
Volume of milk supplied to processing, all categories of suppliers, million t, including:	6	5,4	4,7	4,8	4,7
households, million t	4,4	3,7	2,9	2,9	2,4
agricultural enterprises, million t	1,7	1,8	1,9	1,9	2,3
Export of dairy products, in terms of milk, million t	0,9	1,1	0,9	1	1
Import of dairy products, in terms of milk, million t	0,2	0,2	0,5	0,3	0,3
Overall consumption of milk and dairy products (in terms of milk), million t	10,4	9,9	9,8	9,5	9,4

Source: State Statistic Service of Ukraine

The term "integration" is derived from Latin and means combining separate parts into a whole (*Andriichuk* 2002).

Firstly, the word integration means the organizational combination of technologically interconnected activities with their specific functions to produce the final product and bring it to the consumer, and on this basis to achieve higher economic results.

Secondly, agro-industrial integration means the development of industrial and economic relations between branches and agricultural enterprises, which are interconnected, technologically and objectively by oriented to combine their material interests in the production process and final products from agricultural raw materials' selling (*Sabluk* and *Malik* 2002).

In the agricultural production there are three types of integration: horizontal, vertical and mixed. The horizontal integration occurs by consolidating agricultural enterprises for the production of specific products or services for the one purpose. The vertical integration involves combining businesses that operate in different economic sectors for the purpose of circulation of commercial products. It integrates the production, harvesting, transport, industrial processing and marketing. The mixed integration is found in the consolidating companies of different branches, between which there is no the technological and technical connection with the production and sales.

Objective factors that stimulate the development of integration units are:

- unbalanced relations in the agriculture;
- the intermediaries' dominance in the relationship between company en the agriculture and another agricultural branches, and its industrial infrastructure;
- the lack of a clear government policy to support the development of agricultural enterprises;
- the economic monopoly of processing and service enterprises and the inability of the agricultural sector involvement in the pricing process;
- the company at local market's fullness of its own regional products.

All these reasons make the relevance of the development of relevant theoretical and applied principles of integrated production.

The temper factor in integrating of farmers in horizontal and vertical direction is the absence of necessary resources that allow them to be equal partners in associations. It is possible to improve this situation by the state's participation in such processes as the guarantor of property and financial contributions of farmers. Moreover, despite the significant risk in agriculture, it would be good to provide insurance functions from the state.

Among the advantages of the agro-industrial integration we can select the following:

- it provides a single process of production, procurement, storage and processing of products;
- more favorable conditions for the wide application of the scientific and technological progress are created;
- the reducing of administrative personnel is achieved;
- the conditions for interests' combination of all agricultural participants are created;
- there is the possibility of organizing production through the effective saving of all resources;
- the optimal combination of the territorial and sectored management is provides.

However, behind this success, there are rapid processes at the micro level. Here, the least successful businesses have to wind-up and, thus, assets are concentrated in the hands of the more successful companies. Under the conditions of modest state support, the contrast in the operational results of agricultural companies is becoming even more evident. Therefore, the processes of concentration and verticalization that have occurred during pre-crisis times take the bit also today, when the first shock of the crisis is over. Furthermore, the investment attractiveness of the dairy sector is gradually recovering.

So, we decided to show such successful Ukrainian example of Milkiland N.V. as one of the TOP 5 diversified players in the CIS dairy market.

3.3. Milkiland N.V. – the successful Ukrainian example of the diversified dairy producer

Milkiland is a diversified dairy producer operating in Russia, Ukraine and Poland. The company offers wide range of dairy products such as fresh dairy, cheese, and butter, to satisfy our consumers in their everyday needs for healthy and tasty foods. Milkiland was founded in 1994 as a small dairy trading business, and since that time has grown into a leading dairy company with strong reputation of high-quality producer. Milkiland has grown by acquiring and modernizing old dairy plants.

Milkiland is proud to produce all-natural dairy from the best milk. Over 1,700 Milkiland's people work every day to collect and deliver fresh milk to 11 plants; 3,500 workers and technologists devote themselves to create traditional and new dairy products for consumers. Every day Milkiland supply over 500 tons of high quality fresh dairy, cheese and butter to more than 10,000 retail stores across Russia, Ukraine and other CIS countries.

In Russia Milkiland produce fresh dairy products at Moscow-based OJSC "Ostankinsky Milk Combine" and sell under Ostankinskaya brand. Also, Dobryana Ukrainian cheese is sold in many Russian cities, including Moscow, St. Petersburg, Voronezh, Nizhniy Novgorod, Saratov, Kaluga, Chelyabinsk, Orel, Ekaterinburg, Omsk, and Kaliningrad. In Poland, Milkiland Group acquired Mazowiecka Spoldzielnia Mleczarska Ostrowia, the cheese production plant located in in Ostrów Mazowiecka town of Masovian Voevodeship of the Republic of Poland.

In Ukraine Milkiland has 10 plants producing wide range of dairy products. Milkiland's cheese, fresh dairy and butter are widely available across all Ukrainian cities under brands Dobryana and Kolyada. Milkiland is also a large exporter of dairy products from Ukraine to over 30 countries. About 80% of the Group's milk is collected and processed in Ukraine. The list of these plants consists of Sumy Dairy

Plant, Mirgorod Cheese Producing Combinat, "Menskiy Syr", Mena, "Lactis" Dairy Plant, Kamenets-Podolskiy, Lviv Dairy Combinat, Slavutskiy Butter Producing Combinat, Joint-Stock Company (JSC) "Romenskiy Dairy Combinat", JSC "Konotopskiy Dairy Plant", JSC "Ohtyrskiy Cheese Combinat". Milkiland's business model is outlined in the scheme below *(Figure 3):*

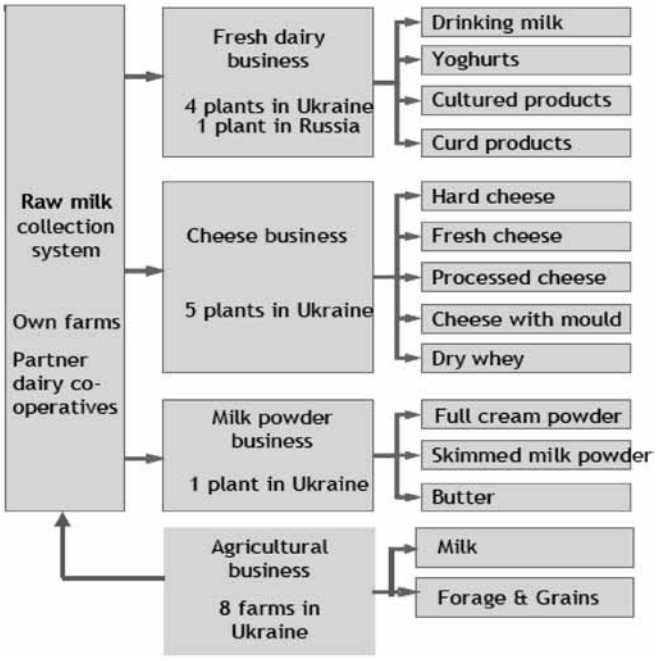


Figure 3: *Multiple sales and distribution channels, 2011*
Sourse: *Aherne F.* (2012)

Mr. Anatoliy Yurkevych (the founder of Milkiland Group and CEO of Milkiland N.V.) and Mrs. Olga Yurkevich (a member of the Board of Directors of Milkiland N.V.) though Dutch vehicle 1 Inc. Cooperatief U.A. control 73.52% of the Milkiland N.V shares. Another 5.0% of the shares are controlled by Mr. Vyacheslav Rekov, former CEO and current Non-executive Director of Milkiland N.V., though R-Assets Cooperatief U.A. also incorporated in the Netherlands. 21.48% of the shares of Milkiland N.V. are in the free float at the Warsaw Stock Exchange since December 6, 2010.

The mission of Milkiland is an essential gift of nature to human beings. The company contributes their intellect, labour and passion, to save and deliver the value of milk to people. Milkiland aim to be international, diversified and vertically integrated milk processor offering "value for money" dairy products, and recognizable for its high-quality standards and consumer loyalty. The company plans to serve its consumers with full range of dairy, including affordable everyday food and premium specialty products.

This company picks out three different values, such as:

1. "Living together with our consumers, suppliers and employees". The company lives the same life as people who purchase our products, and people who produce milk. They share their values, aspirations and worries. The company considers them partners in our business. The company is in permanent contact with our partners and make sure their relations are mutually beneficial.
2. "High quality standards". The company feels strongly responsible for products the company delivers, and do not intend to compromise on quality. The company will continuously invest to assure high quality of raw milk, flawless production process, and safe delivery to retail shelves.
3. "Continuous innovation". The company understands that competition is here, and, in order to be successful and earn the consumers' loyalty, the company is to be innovative in all areas of our business, including milk collection, motivation and professional development of its people, introduction of new products, and marketing.

The main strategy of Milkiland is being one of the largest dairy players in the CIS, the company believes that the company can benefit from significant market growth potential and fragmented competition, by identifying attractive consolidation opportunities and continuing our organic growth. In the medium term the company envisages Milkiland as a clear market leader in cheese and one of the leading whole milk producers in the CIS.

Based on Milkiland's established image of high quality producer, the company intend to position ourselves as "supplier of choice" for families, delivering our dairy products from "meadow grass" to people's homes. The company knows how to make products appealing to consumers with their healthy, genuine qualities and superior taste. Also, the company plans to be market leaders in introducing of new products and thus clearly differentiate Milkiland from competition. The company realizes that price and quality of raw milk determine the appeal of end products for consumers. To support Milkiland's growth and ensure quality product offering, the company plans to establish own milk production, in order to eventually satisfy 20-25% of our internal needs.

Milkiland is active along the dairy value chain. That's why, its business structure looks like:

1. Raw milk supply is important part of business. Almost one-third of employees work on collecting and delivering milk to Milkiland's production units. The company has extensive milk collection system and, in addition, actively develops its own milk farming business. The company plans to increase own milk production, in order to secure high-quality milk for its premium products.
2. Production assets of Milkiland consist of 10 plants in Ukraine, 1 whole milk dairy plant in Moscow, Russia and cheese plant Mazowiecka Spółdzielnia Mleczarska Ostrowia in Mazowian Voivodship of Poland. Milkiland's processing capacity stands at more than 1 million tons per year. Milkiland's plants are capable of producing essentially all range of dairy products.
3. The company distributes products nation-wide in Ukraine and in many Russian cities. Milkiland's distribution network includes large retail chains, local retailers, regional distributors, and exports dealers. Most of company's products are sold in large cities of Ukraine and Russia.

4. The company markets products under recognizable brands with strong reputation for their quality. Milkiland's sales and marketing team works in points of sales to tell consumers about its products and receive instant feedback.

The company produces essentially all range of dairy products including whole milk products, cheese, butter, ice-cream, and different kinds of dry milk powder. Milkiland has 5 fresh dairy plants and 5 cheese-making plants. Also, 1 plant is designed to produce whole milk powder and skimmed milk powder.

Employers of the company are strong believers that continuous improvement and innovations are the key success factors, and follow this modus operandi in product development. One of Milkiland's strong differentiating points is significant offering of in-house developed products that became very popular within consumers.

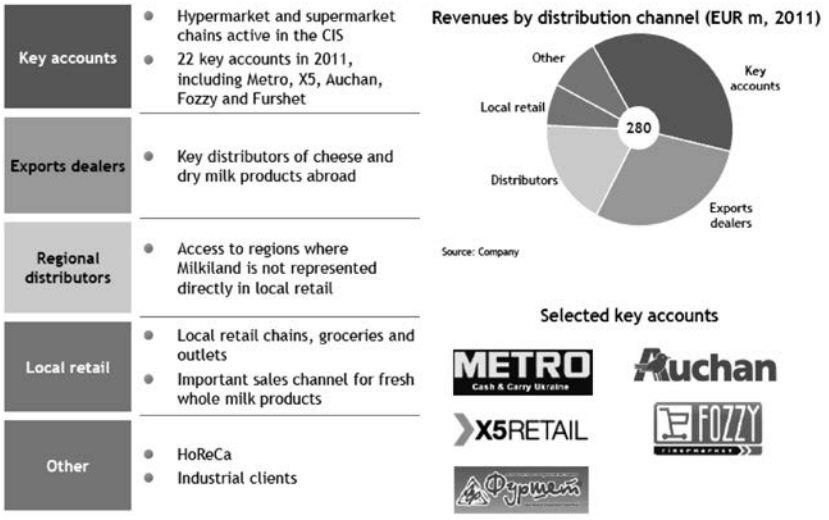


Figure 4: *Multiple sales and distribution channels, 2011*
Sourse: *Aherne F.* (2012)

Milkiland's quality control starts with milk collection and continues throughout the whole chain of milk intake, processing, storage, and delivery to retail. The company is proud to see that its products are highly appreciated by consumers, and continue to build up their credentials in this area. Our strong reputation will reinforce in the near future, as Milkiland plans to become the first Ukrainian dairy company eligible for exports to European Union.

That's why high quality and safety of Milkiland's products is always the primary focus for the Milkiland Group. The company controls the whole supply chain – from farm to people's homes, and thus ensures high quality of our natural, healthy and tasty dairy products. In order to ensure this, the Group introduces state-of-the-art technology at its dairy production assets. We develop the in-house dairy farming to get the highest quality raw milk for our products.

Milkiland's focus on quality is supported with quality management and safety systems based on ISO 9001, ISO 22000 and HACCP standards introduced at Milkiland's factories, as well as a rigid control over procedures enforced by these standards. While Milkiland is an international business with operations in Ukraine, the EU and Customs Union, it both apply norms and laws of the countries of operations and make sustainable efforts to meet the requirements of the European Parliament and European Council Directives and Customs Union Regulations on food safety.

Milkiland is significant player in whole milk products, being one of the largest producer in Ukraine and the 3d player on Moscow market. The company markets its whole milk products under Dobryana and Kolyada brands in Ukraine, and under Ostankinska brand in Russia. Also, the company produces private label products for major retailers such as X5 and Metro (see *Figure 4*).

There is the list of all products, which the company produces.

Dairy drinks. The company offers wide variety of traditional dairy drinks such as sterilized and pasteurized milk, kefir, ryazhenka. Also, the company developed and introduced whey drink that is gaining popularity among our consumers.

Food, snacks, dressings. Milkiland is a big producer of cream, sour cream, and cottage cheese – widely popular local type of cottage cheese. Also, the company restored and introduced to the market old traditional thermostatic products such as prostokvasha and varenets.

Desserts. Milkiland's coated and glazed curds, cottage cheese cakes, and desserts are admired by adults and younger population. In addition to its mainstream brands, the company sells dessert under children Fibo brand.

Yoghurts. Milkiland takes part in high growing yoghurt segment, and offers a wide selection of drinkable and spoonable yoghurts in different types of packaging.

Cheese. Milkiland is significant player in whole milk products, being one of the largest producer in Ukraine and in Moscow. The company is one of the leading cheese company in Russia and Ukraine producing over 30 thousand tones of cheese annually. With over 60 types of cheese produced, Milkiland has the most extensive product offering among local players. All cheese is sold under Dobryana and Kolyada brands in Russia, Ukraine, Kazakhstan, and Moldova.

Hard cheese**.** This is Milkiland's core product in cheese category, as Ukrainians and Russians consume hard cheese in the biggest amounts. The company produces all types of hard cheese and have significant share of in-house developed products. The flagship proprietary cheese, King Arthur, has become very popular both in Russia and Ukraine, and grows in sales by double-digit rate every year.

Specialty cheeses. This group includes white mould cheeses (like Camembert, Brie), blue mould cheeses (like Roquefort, Duplet) and Parmesan-type. These products are new to Ukraine and Russia, however, quickly gaining popularity and are the leaders in consumption growth. Milkiland is the only local producer in this attractive segment, and holds a leading position in Ukrainian market.

Fresh cheese. The company offers to consumers 6 types of traditional (like brynza) and newly introduced fresh cheese products (like Mozzarella). This segment is in its early stage in CIS, but set to grow quickly, as healthy European diet is getting more appealing to local population. The company plans to invest in this area and lead the segment with existing and new products.

Processed cheese. To satisfy the needs of consumers for different cheese products, the company produces 16 types of processed cheese.

Butter. The company offers to our consumers a wide range of dairy butter, made according to best recipes and remarkable for its delicate and sweet flavour. The company sells butter under Dobryana brand, reinforcing this product offering of cheese and whole milk products to Ukrainian and Russian families.

Milkiland is also a large supplier of bulk butter to industrial customers such as confectionery, bakery etc, in Ukraine and abroad.

In 2011 Milkiland delivered strong growth in cheese & butter segment, as well as in dry milk products, in terms of both volume and price. As a result of these developments, revenue grew by 10% to EUR 280 million driven by stronger markets and better sales. Gross profit was depressed by 18% on to EUR 80 million a backdrop of de-facto cancellation of the government subsidies to dairy industry in Ukraine and high raw milk prices in Russia, and the impact of the depreciation of the Russian Rouble.

Apart from agricultural segment development, in 2011 Milkiland started to support milk cooperatives established in the regions of the Groups' operations. In total, 16 cooperatives in 12 regions of Ukraine started their operations in 2011 supported by Milkiland (see *Map 2)*. They provide veterinary services, feed, financial aid and training to their members aiming at higher milk output and quality. Starting from June 2011, by the end of the year, they attracted over 17,000 members and accounted for more than 21,000 milking cows. The share of cooperative milk in the total milk collection in Ukraine reached 18% in December 2011 and amounted to 6% for the whole year. In 2012, cooperatives should provide for over 20% of raw milk collected by Milkiland in Ukraine.

On the cost-side, the new milk sourcing system launched in 2011 will be further developed. Two new state-of-the-art cattle farms will be constructed to house 6,000 milking cows in order to boost the in-house milk production. Such an increase will provide for higher profitability for the group since production costs for in-house milk are 50% cheaper than that purchased from farms. Developing in-house milk production is also a vital factor towards quality control.

On the product mix-side, Milkiland will continue product mix optimization towards modern products with higher marginal contribution. The Group's marketing efforts will be focused on promotion of cheese and thermostatic products under Dobryana brand.

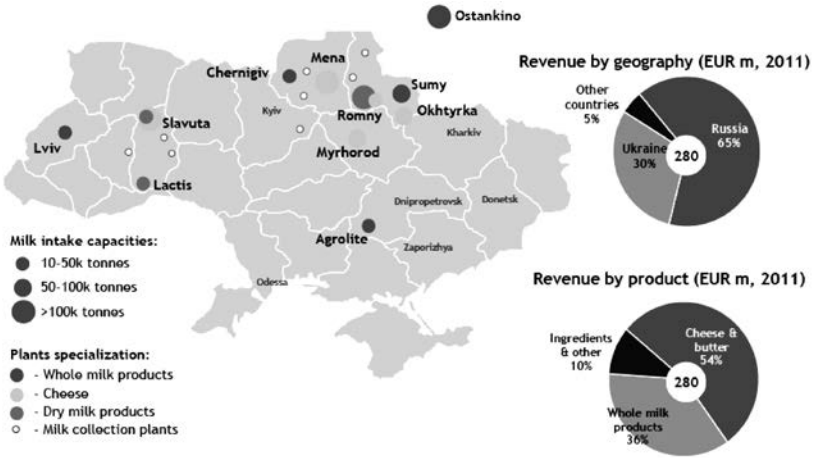
The Group's development will be financed with IPO proceeds and borrowings. In December 2011, the Group signed a new syndicated loan agreement with a syndicate of international banks. The financing in an amount of up to USD 100 million comprise a senior secured long term loan for 4 years with a 12-month grace period. The availability period for loan drawdown is 9 months (270 days). The proceeds from this facility will be used to repay the existing Ukrainian banks loans (USD 35 million) and for general corporate purposes, including working capital needs.

In August 2012 Milkiland acquired Mazowiecka Spoldzielnia Mleczarska "Ostrowia", a cheese production plant located in Ostrów Mazowiecka of Masovian Voivodeship, Republic of Poland.

Ostrowia is an advanced cheese making facility capable of producing wide range of dairy products essential to Milkiland, including hard cheese, curd cheese, yoghurts and processed cheese. In 2003-2007, the Ostrowia undergone major modernization and currently comprises a state-of-the-art cheese plant. Ostrowia brand is well known in the Polish market and abroad.

Ukrainian dairy processor Milkiland paid USD 15 million for the assets of bankrupt Polish cheesemaker Mazowiecka Spółdzielnia Mleczarska "Ostrowia". Milkiland plans to invest USD 4 million in the company's idled manufacturing facility in Ostrów Mazowiecka, Poland, which underwent a full upgrade and modernization from 2003–2007, to manufacture cheese for export to Commonwealth of Independent States countries. The facility has a capacity of 15,000 tons of hard cheese, 7,000 tons of processed cheese and 11,000 tons of yogurts per year.

To our opinion, Ostrowia is a perfect addition to Milkiland's asset base and after launching investments will become one of the largest and best equipped cheese making facilities of Milkiland. This acquisition will bring new international exposure to the business of our Group. With Ostrowia, Milkiland will combine its in-depth knowledge of CIS dairy markets with advantages of Polish



Map 2: Milkiland Group, 2011
Sourse: *Aherne F.* (2012)

dairy sector, such as developed milk supply base, reasonable costs and advanced dairy technologies. Poland is already one of the largest dairy exporter in EU, and Milkiland will turn its still untapped potential to CIS markets, primarily Russia and Ukraine. Also, with Ostrowia, Milkiland opens a door to a tremendous EU dairy market, with long term opportunities for growth and business diversification.

Nowadays in Ukraine the most interesting topic for discussion is the "cheese question". In January 2012, Mr. Gennadiy Onischenko, Chief of Russian Federal Service on Customers' Rights Protection and Human Well-Being Surveillance (Rospotrebnadzor), made a number of statements in respect to poor quality of government quality control systems and, specifically, sub-par quality of Ukrainian cheese exported to Russia. Such statements of Mr. Onischenko were protested by Ukrainian authorities and exporters; a number of independent tests were made and provided to Rospotrebnadzor in order to dismiss allegations.

Public escalation of this conflict resulted in restrictions imposed on three largest Ukrainian exporting plants, including Milkiland's Mena plant. A number of meetings between involved parties (sanitary authorities from both countries, as well as cheese exporters) were held in order to settle the issue.

On April, 9, 2013 Federal Service on Customers Rights Protection and Human Well-Being Surveillance (Rospotrebnadzor) announced simplification of control procedures for exports of Ukrainian cheese to Russian Federation. According to Rospotrebnadzor, from now on there is no need for control of each shipment of exported cheese. This decision was adopted based on laboratory tests of 1260 samples of Ukrainian cheese, made during 2012-2013, which have confirmed the compliance of the checked products with the requirements of the Russian Federal Law dated 12 June 2008 "Technical regulations of milk and milk products". Rospotrebnadzor will continue control of quality of the Ukrainian cheese along with the regular approach envisaging retail outlets sampling.

By the way, this year independent experts prove the quality of Milkiland cheese exported to Russia. Milkiland's cheese Vershkovy (Creamy), Smetankovy, Marble and King Arthur sold under Dobryana trademark have been tested by Russia's leading independent testing institution "Soyuzekspertiza" of the Russian Chamber of Commerce. Results of the fat acid tests show that all samples tested fully comply with the Russian technical regulations for milk and dairy products.

Taking into the account, that Milkiland's Mena plant is one of the best equipped cheese facilities in Ukraine certified according to EU standards, which is also fully fulfills Russian technical and safety standards, Milkiland is positive about prompt removal of the export limitations for this facility.

In this case, economic impact on Milkiland would be minor, because other exporting plants (Okhtyrka and Romny) can satisfy low-season export volumes, losses associated with temporary low volumes of cheese exports should be compensated by a respective decrease in raw milk price, which already took place in Ukraine from the beginning of 2012.

Conclusions

The dairy sub-complex occupies an important place in the agriculture of Ukraine, as it provides the population of vital food products, many of which are strategic in the export potential. Unique properties of milk and its processing products lead to the necessity of consumers' uninterrupted provision of such products, which requires the effective functioning of the dairy sub-complex.

According to results 2010, 12,2 million tons of milk was produced in the country. The dairy industry of Ukraine totals over 450 enterprises, but recently only about 250 dairy plants/enterprises really process large volumes of milk (over 6 million tons). Experience shows (and not only Ukrainian), that the most effective schemes are those that support the whole supply chain.

Good example of such scheme shows Milkiland Group. It is a diversified dairy producer operating in Russia, Ukraine and Poland. The company offers wide range of dairy products such as fresh dairy, cheese, and butter, to satisfy our consumers in their everyday needs for healthy and tasty foods. Milkiland was founded in 1994 as a small dairy trading business, and since that time has grown into a leading dairy company with strong reputation of high-quality producer. Milkiland has grown by acquiring and modernizing old dairy plants.

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reached 18% in December 2011 and amounted to 6% for the whole year.

The new year brings new opportunities and new challenges to dairy business. The re-introduction of the government subsidies to raw milk producers by the Ukrainian Parliament from 1 January 2012 led to a decline in input costs for dairy production, which should positively influence the producers. The major challenge for dairy business is the on-going dispute with Russia regarding quality of the Ukrainian dairy products exported to this country. Some limitations imposed by Russian authorities (Rospotrebnadzor) on export of this product to Russia could weaken dairy producers' positions in this market.

Milkiland's management believes that theirur strong commitment and constant efforts to deliver the Group's development strategy will bring positive results, new prospects and will strengthen its positions as TOP-5 CIS diary market player.

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COUNTRY-SPECIFIC DETERMINANTS OF HORIZONTAL AND VERTICAL INTRA-INDUSTRY AGRI-FOOD TRADE: THE CASE OF BULGARIA AND ROMANIA

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Abstract: The article analyses patterns and country-specific determinants of agri-food trade of Bulgaria and Romania with the European Union. As literature focusing on agricultural aspects of the topic is limited, the paper seeks to contribute to the literature by providing up to date results and suggestions as well as by identifying the determinants of horizontal and vertical intra-industry trade of the Bulgaria and Romania after EU accession. Results suggest that intra-industry agri-food trade is mainly of vertical nature, referring to trade of different quality products. Results verify that determinants of horizontal and vertical IIT are similar and suggest that economic size and FDI are positively, while factor endowments and distance are negatively related to both sides of IIT. Results are mainly in line with the majority of empirical literature in the field.

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Keywords: intra-industry trade, determinants, Bulgaria, Romania. **JEL code:** Empirical Studies of Trade – F14

1. Introduction

Agri-food trade of the New Member States (NMS) has changed remarkably during the previous decade. One of the major factors contributing to such changes was EU accession, by which former trade barriers have diminished. The article analyses the patterns and determinants of agri-food trade of Bulgaria and Romania with the European Union by using the theory of intra-industry trade. There is a wide range of literature generally analysing intra-industry trade patterns but one important shortcoming of such literature is that it ignores the distinction between horizontal and vertical IIT and ignores the fact that they may have different determinants. Literature focusing on the country-specific determinants of vertical and horizontal intra-industry trade is rather limited and those analysing agricultural (or agri-food) trade are extremely rare.

The paper seeks to contribute to the scant literature of the field in two ways. First, it covers latest theory and data available on the topic to provide up to date results and suggestions. Second, it seeks to identify the determinants of horizontal and vertical intra-industry trade of Bulgaria and Romania after EU accession. Results are especially important for these countries as they both became EU members in 2007.

In order to meet these aims, the article is structured as follows. The first part provides an overview of the literature and recent empirical studies of the topic, while the second summarises methods of horizontal and vertical IIT measurement. The third part describes some basic patterns of horizontal and vertical intra-industry agri-food trade between Bulgaria, Romania and the European Union, followed by the presentation of hypotheses and empirical results. The last part concludes.

2. Literature review

Traditional trade theories assume constant returns to scale, homogenous products and perfect competition and aim to explain inter-industry trade based on comparative advantages. However, a significant portion of the world trade since the 1960s took the form of the intra-industry trade rather than inter-industry trade. Consequently, traditional trade models proved to be inadequate in explaining this new trade pattern as there is no reason for developed countries to trade in similar but slightly differentiated goods.

In the 1970's, an increasing amount of research dealt with this issue, providing a theoretical basis for intra-

industry trade (IIT), defined as the simultaneous export and import of products belonging to the same statistical product category. The first synthesising model of IIT was developed by Helpman and Krugman (1985), creating a framework for intra-industry trade theory by using the Chamberlin monopolistic competition theory. This model combines monopolistic competition with the Heckscher-Ohlin (HO) theory, incorporating factor endowments differences, horizontal product differentiation and increasing returns to scale. It has pointed out that comparative advantages drive inter-industry trade through specialisation, while economies of scale drive intra-industry trade.

According to the pioneering work of the Falvey (1981), notions of horizontal and vertical product differentiation have come into existence in the literature. Horizontal IIT refers to homogenous products with the same quality but with different characteristics, while vertical IIT means products traded with different quality and price. Following the author's work, three types of bilateral trade flows may occur between countries: inter-industry trade, horizontal IIT and vertical IIT.

Horizontal differentiation is more likely between countries with similar factor endowments, while according to Falvey and Kierzkowski (1987), vertically differentiated goods occurs because of factor endowment differences across countries. As the authors suggest, the amount of capital relative to labour used in the production of vertically differentiated good indicates the quality of the good. Consequently, higher-quality products are produced in capital abundant countries while lower-quality products are produced in labour abundant countries. Thereby vertical IIT occurs as the capital abundant country exports higher-quality varieties as well as the labour abundant country exports lower-quality products. It is therefore predictable that the share of vertical IIT will increase as countries' income and factor endowments diverge.

Many studies have analysed the determinants of intra-industry trade in general (e.g. Leitão and Faustino 2008, Rasekhi 2008, Wang 2009), though just a limited amount of literature is focused on the country-specific determinants of vertical and horizontal intra-industry trade. Greenaway et al. (1994) were the first to analyse country-specific factors of horizontal and vertical intra-industry trade in the UK and found that vertical IIT is more important in the UK than horizontal IIT and that the inter-country pattern of vertical IIT is systematically related to a range of explanatory variables. Aturupane et al. (1999) searched for the determinants of horizontal and vertical intra-industry trade between Eastern Europe and the European Union and showed that the determinants of the two types of IIT are likely to differ, with vertical IIT being more a reflection of endowment or technology-based factors, and horizontal IIT being more dependent on factors such as scale economies and imperfect competition.

Kandogan (2003) analysed IIT of transition countries and concluded that variables from the increasing returns trade theory, such as scale economies, similarity of income levels, and number of varieties produced play important roles in horizontal IIT, whereas factors such as comparative advantage or dissimilarity in income levels are more related to vertical IIT. Zhang and Li (2006) investigated country-specific factors of intra-industry trade in China's manufacturing and underlined that the more countries differ in relative country size and relative factor endowments, the less likelihood there is for IIT and horizontal IIT. They also emphasised that difference between countries in relative factor endowments lead to more inter-industry trade, which in turn suppresses IIT and vertical IIT.

Fertő (2005, 2007) analysed Hungarian intra-industry agri-food trade patterns with the EU15 and confirmed the comparative advantage explanation of vertical IIT, while stressing that using a measure of IIT that reflects the level of trade produces better regression results than those based on the degree or share of IIT.

Caetano and Galego (2007) were searching for the determinants of intra-industry trade within an enlarged Europe and found that determinants of horizontal and vertical IIT differed, although both had a statistically significant relationship with a country's size and foreign direct investment. Turkcan and Ates (2010) investigated for the determinants of IIT in the U.S. Auto-Industry and besides confirming that determinants of horizontal and vertical IIT differ, showed that vertical IIT is positively associated with average market size, differences in market size, differences in per capita GDP, outward FDI and distance, while it is negatively correlated with the bilateral exchange rate variable.

Leitao (2011) examined intra-industry trade patterns in the Portugese automobile sector and concluded that intra-industry trade occured more frequently among countries that were similar in terms of factor endowments as well as pointed out that no positive statistical association existed between HIIT and Heckscher-Ohlin variables. Ambroziak (2012) investigated the relationship between FDI and IIT in the Visegrad countries and found that FDI stimulated not only VIIT in the region but also HIIT.

2.1. Measuring horizontal and vertical IIT

Several methods exist to measure intra-industry trade. First, the classical Grubel-Lloyd (GL) index has to be mentioned, which is expressed formally as follows (Grubel and Lloyd, 1975):

$$GL_i = 1 - \frac{|X_i - M_i|}{(X_i + M_i)} \tag{1}$$

where X_i and M_i are the value of exports and imports of product category i in a particular country. The GL index varies between 0 (complete inter-industry trade) and 1 (complete intra-industry trade) and can be aggregated to level of countries and industries as follows:

$$GL = \sum_{i=1}^{n} GL_i w_i \text{ where } w_i = \frac{(X_i + M_i)}{\sum_{i=1}^{n}(X_i + M_i)} \tag{2}$$

where w_i comes from the share of industry i in total trade. However, several authors criticised the GL-index, for five main

reasons: (1) aggregate or sectoral bias, (2) trade imbalance problem, (3) geographical bias, (4) inappropriateness to separate horizontal and vertical intra-industry trade (HIIT and VIIT), (5) inappropriateness for treating dynamics. Detailed discussion of these problems but the fourth would distract from the basic aim of this paper; a comprehensive review can be found in Fertő (2004).

The fourth problem of the GL index is given by the joint treatment of horizontal and vertical trade. Literature suggests several possibilities for solving this problem. Among these solutions, the most widespread one is based on unit values developed by Abd-el Rahman (1991). The underlying presumption behind unit values is that relative prices are likely to reflect relative quantities (Stiglitz, 1987). According to the widespread view in the literature based on this presumption, horizontally differentiated products are homogenous (perfect substitutes) and of the same quality, while vertically differentiated products have different prices reflecting different quality (Falvey, 1981). According to the method of Greenaway et al. (1995), a product is horizontally differentiated if the unit value of export compared to the unit value of import lies within a 15% range at the five digit SITC level. If this is not true, the GHM method is talking about vertically differentiated products. Formally, this is expressed for bilateral trade of horizontally differentiated products as follows:

$$1-\alpha \le \frac{UV_i^X}{UV_i^M} \le 1+\alpha \tag{3}$$

where UV means unit values, X and M means exports and imports for goods i and ά=0.15. If this equation is not true, GHM method talks about vertically differentiated products. Furthermore, Greenaway et al. (1994) added that results coming from the selection of the 15% range do not change significantly when the spread is widened to 25%. Blanes and Martín (2000) developed the model further and defined high and low VIIT. According to their views, low VIIT means that the relative unit value of a good is below the limit of 0.85, while unit value above 1.15 indicates high VIIT.

Based on the logic above, the GHM index comes formally as follows:

$$GHM_k^p = \frac{\sum_j \left[\left(X_{j,k}^p + M_{j,k}^p\right) - \left|X_{j,k}^p - M_{j,k}^p\right|\right]}{\sum_j \left(X_{j,k} + M_{j,k}\right)} \tag{4}$$

where X and M stands for export and import, respectively, while p distinguishes horizontal or vertical intra-industry trade, j is for the number of product groups and k is for the number of trading partners (j, k = 1, ... n).

There is another method in the literature to distinguish HIIT and VIIT. Fontagné and Freudenberg (FF method, 1997) categorize trade flows and compute the share of each category in total trade. They defined trade to be „two-way" when the value of the minority flow represents at least 10% of the majority flow. Formally:

$$\frac{Min(Xi, Mi)}{Max(Xi, Mi)} \ge 10\% \tag{5}$$

If the value of the minor flow is below 10%, trade is classified as inter-industry in nature. If the opposite is true, the FF index comes formally as:

$$FF_k^p = \frac{\sum_j \left(X_{j,k}^p + M_{j,k}^p\right)}{\sum_j \left(X_{j,k} + M_{j,k}\right)} \tag{6}$$

After calculating the FF index, trade flows can be classified as follows: horizontal two-way trade, vertical two-way trade and one-way trade.

According to Fontagné and Freudenberg (1997), the FF index tendentiously provides higher values compared to GL-type indices (like the GHM index) as equation 5 refers to total trade, treated before as two-way trade. The authors suggest that FF index rather complements than substitutes GL-type indices as they have measured the relative weight of different trade types in total trade. In conclusion, they found that the value of GHM index is usually between the GL and FF index.

All the indices shown above measure the share of intra-industry trade instead of its level which is a much better index as Nilsson (1997) suggests. According to the author, IIT should be divided by the number of product groups in total trade, resulting in an average IIT by product group. Applying this logic to horizontal and vertical IIT, the Nilsson index is formally express as:

$$N_k^p = \frac{\sum_j \left[\left(X_{j,k}^p + M_{j,k}^p\right) - \left|X_{j,k}^p - M_{j,k}^p\right|\right]}{n^p} \tag{7}$$

where the numerator equals to that of the GHM index, while n refers to the number of product groups in total trade. Nilsson argues that his measure provides a better indication of the extent and volume of IIT than GL-type indices and is more appropriate in cross-country IIT analyses.

In order to perform calculations based on the above equations, the article uses the Eurostat international trade database using the HS6 system (six digit breakdown) as a source of raw data. Agri-food trade is defined as trade in product groups HS 1-24, resulting in 964 products using the six digit breakdown. The article works with trade data for the period 2005–2010 due to data availability. In this context, the EU is defined as the member states of the EU27.

3. Horizontal and vertical IIT patterns

Using the above methods, horizontal and vertical intra-industry trade were calculated for agri-food trade between

Bulgaria, Romania and EU27 for the period 1999–2010. Table 1 shows that agri-food intra-industry trade is mainly vertical in nature in both countries, as evident from the vertical values compared to the horizontal ones. However, low values for total IIT (the sum of vertical and horizontal IIT) indicate that inter-industry trade prevails in both countries agri-food trade with EU27 between 1999 and 2010. These findings are consistent with the results of previous research in the region (Ambroziak, 2012). It is important to note, though, that all indices analysed increased in the third period, indicating that intra-industry trade (as a measure of economic integration) has grown after EU accession.

Table 1: Horizontal and vertical agri-food IIT in Bulgaria and Romania with EU27 trade in 1999–2010*

Indicator	Bulgaria			Romania		
	1999–2002	2003–2006	2007–2010	1999–2002	2003–2006	2007–2010
GL	0.04	0.05	0.10	0.02	0.03	0.08
GHMH	0	0.01	0.02	0.01	0.01	0.01
GHMLV	0.02	0.03	0.07	0.01	0.01	0.05
GHMHV	0.01	0.01	0.02	0.01	0.01	0.02
FFH	0.01	0.01	0.04	0.01	0.01	0.02
FFLV	0.04	0.06	0.10	0.02	0.02	0.08
FFHV	0.02	0.02	0.03	0.01	0.02	0.02
NH	115	441	4585	323	505	5283
NLV	602	1426	10223	565	1688	14212
NHV	304	818	2892	552	1142	6013

Source: Own calculations based on *Eurostat* (2012)

Note: For definitions of GHMp, FFp and Np, where p is horizontal (H) or vertical (V) intra-industry trade, see equations (4), (6) and (7) in the text. Np is measured in thousand euro.

Despite the steadily increasing absolute VIIT numbers in the period, the share of VIIT in total IIT in Bulgaria and Romania shows a decreasing trend, indicating that less quality-based products are traded with EU27 *(Figure 1).* The highest decrease can be seen in Bulgaria where VIIT gave 88% of total IIT in 1999, while only 53% in 2010. In case of Romania, a heavy decrease in the share of VIIT compared to total IIT around the millennium was followed by a stable rate of 75–80% after EU accession.

Figure 2 and 3 provide further insights to the analyses above. Using the idea of Blanes and Martín (2000), VIIT was separated into vertically high and low categories, suggesting different qualities of trade. Taking into account the geographical patterns of IIT in Bulgaria and Romania, it becomes evident that low vertical IIT dominates agri-food trade, while the share of high vertical IIT varies around 30% in most cases. Similar results can be obtained if this pattern is analysed in time. The overall picture is quite unfavourable to both countries as the trade of low quality products is usually associated with low prices and unit values, suggesting structural problems in agriculture (Ambroziak, 2012).

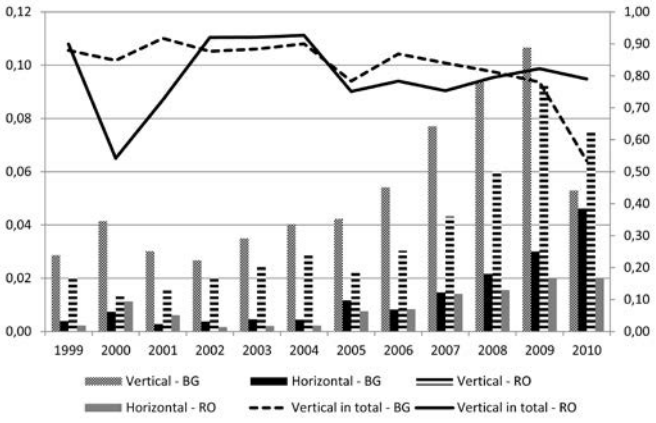

Figure 1: The share of vertical IIT in total IIT between Bulgaria, Romania and EU27, 1999–2010*
*Based on the GHM-method.
Source: Own calculations based on *Eurostat* (2012)

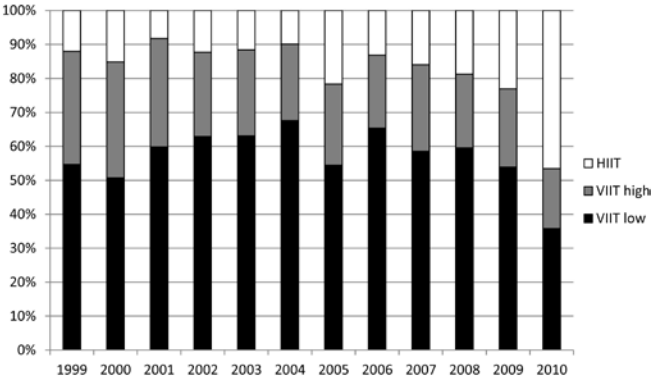

Figure 2: The pattern of IIT in agri-food products between Bulgaria and EU27, 1999–2010, (%)*
*Based on the GHM-method.
Source: Own calculations based on *Eurostat* (2012)

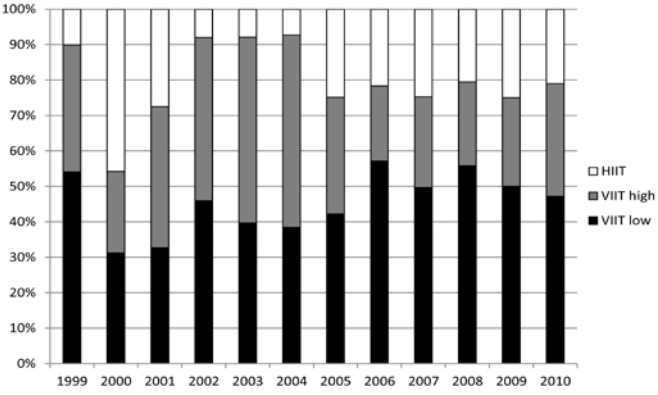

Figure 3: The pattern of IIT in agri-food products between Romania and EU27, 1999–2010, **(%)***
*Based on the GHM-method.
Source: Own calculations based on *Eurostat* (2012)

In short, IIT is mainly of a vertical nature in Bulgaria and Romania, suggesting the exchange of products of different quality. Moreover, it seems that the majority of agri-food trade between these countries and its EU partners has still remained one-way (or inter-industry) in nature, suggesting complementarity rather than competition in production (Fertő, 2007).

4. Determinants of horizontal and vertical IIT

As described in the literature review, theory argues that HIIT and VIIT determinants differ. This may explain why econometric analyses having total (horizontal and vertical) IIT as their dependent variable may be mis-specified. Therefore, the determinants of HIIT and VIIT will now be investigated separately for the case of Bulgaria's and Romania's agri-food trade with EU27. The balanced panel data set contains trade with each and every EU member state (26 members plus the reporter) for twelve years (1999–2010) and 964 products, resulting in almost 600,000 observations. As the majority of literature regresses a measure of IIT on a range of possible explanatory variables without any predefined method, this article uses panel estimation techniques, capturing both cross-sectional and time-dependent special effects. Therefore, consistent with the literature on the determinants of IIT, hypotheses are as follows:

H1. Difference in factor endowments between trading partners increases (decreases) the share of vertical (horizontal) IIT in total trade.

The difference in factor endowments is usually measured by inequality in per capita GDP, in line with the model developed by Falvey – Kierzkowski (1987). Linder (1961) considers that countries with similar demands have similar products, consequently vertical type trade increases with differences in relative factor endowments. Factor endowments are proxied by the logarithm of absolute value of the difference in per capita GDP between Bulgaria and Romania and their trading partners (lnDGDPC), which is expected to be positively related to the share of vertical IIT. LnDGDPC is measured in PPP in current international dollars and data comes from the World Bank WDI database.

H2. The smaller the difference in economic size of the two partner economies, the higher the expected IIT in their trade.

The larger the international market, the larger the opportunities for production of differentiated intermediate goods and the larger the opportunities for trade in intermediate goods. The logarithm of the absolute difference in the average GDP of trading partners is used as a proxy for the average size of markets. LnAVGDP is measured in PPP in current international dollars and the source of data is also the World Bank WDI database. A positive sign for both horizontal and vertical IIT is expected.

H3. The larger the share of foreign direct investment (FDI) in the host country, the higher the share of HIIT and VIIT.

Multinational companies have crucial influence on IIT through their FDI activities. Investing in production facilities abroad creates the possibility to exchange products at different levels in the production stage, thereby contributing to IIT. The logarithm of the absolute difference of stocks of FDI (in billion USD) in Bulgaria and Romania is used to test this hypothesis. FDI is measured in current international USD and data is coming from the WDI database. A positive sign is expected for VIIT as well as HIIT.

H4. IIT will be greater the closer the countries are geographically.

The distance between countries well reflects transport costs. It is evident that the closer the countries are, the cheaper trade is. Variable lnDIST indicates the geographic distance between the reporting country and each of its trading partners by calculating the logarithm of the distance between the capital cities of trading partners in kilometres. The source of data is the CEPII database. LnDIST is expected to be negatively related to HIIT and VIIT.

In order to test hypotheses above, the following standard panel regression model is employed:

$$\ln IIT_{ijt} = \alpha_0 + \alpha_1 \ln DGDPC_{ijt} + \alpha_2 \ln AVGDP_{ijt} + \alpha_3 \ln DFDI_{ijt} + \alpha_4 \ln DIST_{ijt} + v_{ij} + \varepsilon_{ij}$$

where $\ln IIT_{ijt}$ is log of measure of total, vertical, and horizontal IIT, i = Bulgaria/Romania and j = EU27 partner country, t = time; $\ln DGDPC_{ijt}$ is the log of absolute difference in per capita GDP between i and j. LnAVGDP is the log of average value of GDP between i and j, while lnFDI is the log of absolute difference of FDI between i and j; lnDIST is log of distance between the capital cities of i and j. The expected signs for HIIT are α_1 and $\alpha_4 < 0$, α_2 and $\alpha_3 > 0$, while for vertical IIT are $\alpha_1, \alpha_2, \alpha_3 > 0$ and $\alpha_4 < 0$. Table 2 provides an overview of the details associated with variables.

Table 2: Description of independent variables

Variable	Variable description	Data source	Expected sign	
			HIIT	VIIT
lnDGDPC	The logarithm of per capita GDP absolute difference between trading partners measured in PPP in current international USD	World Bank WDI database	-	+
lnAVGDP	The logarithm of average GDP absolute difference between trading partners measured in PPP in current international USD	World Bank WDI database	+	+
lnFDI	The logarithm of FDI net inflows absolute difference between trading partners measured in current international USD	World Bank WDI database	+	+
lnDIST	The logarithm of absolute difference between trading partners capital city measured in kilometres	CEPII database	-	-

Source: Own composition

5. results and discussion

The use of a fixed effects model to capture country differences was rejected as a time invariant regressor (lnDIST) is incorporated in the model. Random effects models have been estimated employing generalised least squares and maximum-likelihood approaches. The most robust results in terms of statistical significance were found with the former method, therefore only this specification is reported.

Three equations were estimated in line with the three methods of measuring intra-industry trade given in the literature review. Regarding the determinants of horizontal IIT, it is observable that all the three methods provide similar results *(Table 3).* LnDGDPC and lnDIST are negative for all estimations, while lnAVGDP and lnFDI show positive signs. It can also be seen that lnDGDPC, lnAVGDP and lnDIST are highly significant in all cases, while lnFDI are less significant. Note that results for the Nilsson-index remain to be less significant than the others. These results are in line with previous expectations on the signs of the relationship. None of the hypotheses above can be rejected.

Table 3: Determinants of horizontal IIT in Bulgaria and Romania

Independent variable	Dependent variable		
	GHM^H	FF^H	N^H
lnDGDPC	–0.0059*** (–2.61)	–0.0086** (–2.48)	–1672.67** (–2.21)
lnAVGDP	0.0023*** (2.72)	0.0027** (2.05)	650.08** (2.30)
lnFDI	0.0019** (1.94)	0.0033** (2.14)	502.81 (1.56)
lnDIST	–0.0070*** (–3.36)	–0.0089*** (–2.79)	–1798.52** (–2.56)
Constant	0.0055 (0.69)	0.0061 (0.51)	834.25 (0.31)

Note: Numbers in parentheses are z statistics; significance levels are *** = 1%, ** = 5%, * =10%.
Source: Own calculations based on Eurostat (2012)

As to the determinants of vertical intra-industry trade, results by method (see *Table 4*) show similar signs than those occurred in the horizontal case. All variables meet previous expectations on signs. Note, however, that lnDGDPC seems to be less significant than in the previous case, though all other variables are strongly significant in most cases (with Nilsson-indices to be slightly less significant than the others). Moreover, none of the hypotheses above can be rejected.

The results of the predefined econometric model suggest that there is a negative relationship between factor endowments and horizontal IIT, while relationship is ambiguous between factor endowments and vertical IIT, indicating that countries with similar factor endowments trade products of similar quality, while those with different factor endowments trade different quality products. Results also highlight that differences in economic sizes are positively associated with IIT, suggesting that countries with different sizes are more likely to have IIT trade patterns. Moreover, the article identifies a negative relationship between distance and IIT meaning that geographical proximity fosters agri-food IIT. Furthermore, a positive relationship exists between FDI and both sides of IIT, meaning that more foreign capital generate more trade of similar products between Bulgaria, Romania and the EU.

Table 4: Determinants of vertical IIT in Bulgaria and Romania

Independent variable	Dependent variable		
	GHMV	FFV	NV
lnDGDPC	–0.0046** (–0.75)	–0.0056* (–0.57)	–1920.4 (–1.43)
lnAVGDP	0.0058*** (2.68)	0.0108*** (3.11)	1908.88*** (3.82)
lnFDI	0.0051*** (2.84)	0.0074*** (2.81)	424.87 (0.75)
lnDIST	–0.0242*** (–3.71)	–0.0432*** (–3.99)	–4959.08*** (–3.95)
Constant	–0.0251 (–0.97)	–0.0486 (–1.11)	–2474.64 (–0.52)

Note: Numbers in parentheses are z statistics; significance levels are *** = 1%, ** = 5%, * = 10%.
Source: Own calculations based on Eurostat (2012)

As none of our hypotheses can be rejected, it is proven that the determinants of Bulgarian and Romanian agri-food IIT are similar to other countries in the region (Ambroziak 2012, Fertő 2007, Caetano and Galego, 2007). Moreover, it turned out that determinants of horizontal and vertical IIT are similar in this case.

6. Conclusions and limits

The article analysed patterns and country-specific determinants of agri-food trade of Bulgaria and Romania with the European Union. Three different approaches were used to calculate intra-industry trade indices (GHM, FF and the Nilsson-method), providing the basis for regressions run on the determinants of horizontal and vertical IIT. The following results were obtained.

First, it became clear that IIT is of vertical nature in the relations analysed, referring to trade of different quality products. Although the share of IIT is increasing after accession, the majority of agri-food trade is still inter-industry in nature. Taking into account the geographical patterns of IIT in Bulgaria and Romania, it becomes evident that low vertical IIT dominates agri-food trade.

Second, results of suggest a negative relationship between factor endowments and horizontal IIT, while relationship is ambiguous between factor endowments and vertical IIT, indicating that countries with similar factor endowments trade products of similar quality, while those with different factor endowments trade different quality products. Results also suggest that differences in economic sizes are positively associated with IIT, while FDI and IIT are positively associated, meaning that more foreign capital suggests more IIT.

However, the article has several limitations. First of all, the choice of variables for testing hypotheses is crucial and it is clear that different indicators might end in different results for the same hypothesis. Second, the measurement of variables also plays an important role as even the same variables can be measured in many ways. Third, the change of the dataset used might also result in different results as methodology of statistical offices usually varies. Fourth, different model specification might also alter results, though the main trends are not suspected to change. In the future, it might be interesting to test whether changes above end up in statistically significant different results.

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THE ROLE OF BEEKEEPING IN PRODUCTION OF OIL CROPS

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Abstract: Production of sunflower oil are expected to serve larger and larger extent – over the demand of food industry and chemical industry – biofuel production. This could be especially true for that areas where climate is not allowed to grow winter rape safely and economically. Ecological role of honey-bees can be considered undoubtful in preservation of biodiversity of flora and fauna. I analyse the following problems in our study:

- What is the significance of oil plants in European and Hungarian energy production?
- How influence pollination the yields and the safety of production of oil plants?
- What is the role of oil plants in the development of production structure of beekeeping?
- What are the economical advantages of the above-mentioned effects?

Keywords: oil plants, biodiesel, bio-energy, bee, pollination

1. Introduction

While everybody knows the ecological importance of bees, yet the economic significance of bees and beekeeping sector can be difficult to accurately access. The economic statistical surveys usually measure only the contribution of beekeeping to GDP through sale and export. However bees play key role in cultivation techniques of crops requiring insect pollination, thus in production of oil crops as well. Nevertheless oil crops play important role not only in food supply, but also in production of bio-propellants. The importance of pollination is hard or impossible to express in money, since its role is essential, but it is plentifully available in Hungary, thus it is worth nothing and everything at the same time.

Increasing population and improving living standard are accompanied by growing demand for food and energy as well. Currently the population of the world annually consumes 500 EJ energy (IEA, 2013) (approximately 8 MJ/hour/capita on an average!) and it will probably increase by 25% until 2030 despite of the energy-saving measures (Ortwein, 2011). Decrease of fossil reserves, rising costs of exploitation lead to the increase of energy prices – in addition to the growth of environmental damages. Their partial replacement is a key issue of all kinds of economic policy; nevertheless arable energy production could improve the income position of agriculture as well as the safety of sale (Bai, 2008). On the other hand – from food safety, environmental protection, land utilisation, energy efficiency point of view – production obviously has limits in this case as well.

2.The importance of oil crops and biodiesel

As demand for oil crops – through this, particularly the domestic sowing area of rape – is considerably influenced by the use for propellant, thus I deem it advisable to briefly introduce this segment of use as well.

At present biodiesel substitutes only 1% of global gasoline use, however fourfold of this value is utilised in the EU. Between 2007 and 2012 global production is almost doubled, it increased from 9 239 thousand tonnes to 18 510 thousand tonnes (21 billion litres) (Jobbágy 2013). In 2012 the biodiesel production of the EU (Jobbágy 2013) gave about 43% of global production. As a new tendency, next-generation biofuels like TBK-biodiesel and algae-oil-methylester have already been appeared in biodiesel production, but they should not be cause appreciable effect on oil plant production (Bai, 2011). *Figure 1.* demonstrates the continually increasing utilisation of diesel in contradiction to petrol, which slightly decreases. It can be mainly explained by the fact that from environmental protection and economic aspects the utilisation of diesel is more favourable than the use of petrol.

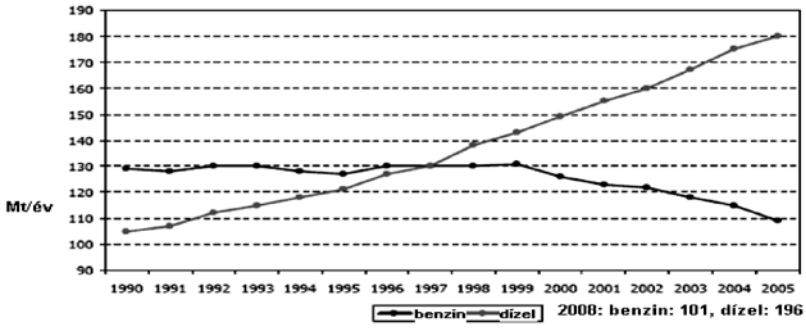

Figure 1.: **The evolution of petrol and diesel consumption in the EU**
Source: Eurostat (2010)

In 2010 the capacity of biodiesel plants was 21.9 million tonnes/year in the EU (Popp et al, 2010), the utilisation of it was 41%; in 2011 this proportion was only 33% (Jobbágy 2013), thus biodiesel is produced in a more costly way, their competitiveness can be improved very simply by continuous operation. It entails the further increase of the sowing area of rape, which can not be accessed easily in view of rotation period and food safety aspects. *Table 1.* illustrates the domestic, EU and global basic data of the most important oil crops being allowed to produce in the EU.

Table 1: Sowing area of sunflower and rape as well as their expected yield (2010/2011)

	World		EU		Hungary	
MU	Mill ha	Mill t	Mill ha	Mt	Thsd ha	Thsd t
Sunflower	23	31,8	3,8	6,7	501	973
Rape	31,7	59,8	6,8	21,2	261	555

Source: www.akii.hu, www.fapri.org

While the role of Hungary can be considered significant in sunflower production within the EU, owing to the domestic weather conditions rape can be produced by much smaller yields, higher average cost and greater risk in comparison with western-European countries (*Figure 2.*). This two oil crops represented about 16% (732 thousand tonnes) in crop structure in 2010, which approached the theoretical limit from the crop rotation point of view. *Figure 2.* also well presents that the sowing area of the most important oil crops was doubled in the past years, which was primarily owing to the production of rape of biodiesel purpose. In compliance with Pepó (2011) in Hungary the sowing area of sunflower can be enlarged to maximum 600–650 thousand ha without any negative consequences, while in case of rape the same sustainable limit can be maximum 390–420 thousand ha. The limitedness of sowing area is typical in other countries of the EU and the world as well, although there have been still reserves in that respect in the agriculture of the world, it can be generally stated that this reserves show a downward tendency everywhere and they are limited.

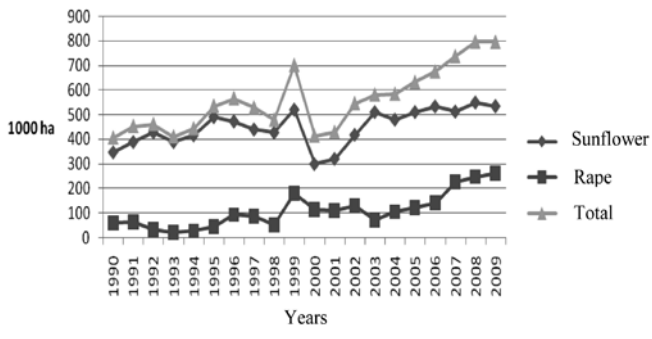

Figure 2: The alternation of the sowing area of sunflower and rape in Hungary (1990–2009)
Source: www.ksh.hu (2010)

The current domestic and EU market tendencies show increasing demand for sunflower products, to which the decline of the EU stores and soy bean import contribute. The quality of rape is clearly worse as regards feeding aspects, though from the motor point of view it is better than sunflower (Molnár et al (AKI), 2011).

3. The role of beekeeping in oil crop production

The ecological importance of bees and other pollinating insects in preservation of the biodiversity of the flora and fauna is undoubted (Daily, 1997). While sunflower- and rape sector are bee pastures for the bees, on the other hand bees – mainly the pollinating activity of them – are elements of the cultivation practices for the oil crops' sector. According to Lampeitl (2009) the honey-bee (Apis melifera) carries the 80% of insect pollination, while McGregor (1976) considers pollination as the most important economic factor primarily in monoculture cultivation. In case of certain orchards the 90% of yield depend on the activity of pollinating bees (Southwick és Southwick, 1992). Allsopp et al. (2008) make the value of pollination equal with the costs of that. In order that the effect made by beekeeping sector to crop production can be valued, we have to be acquainted with the aspects on the score of which the bees choose bee pasture and with the factors influence their activity.

Bees collect pollen as nutriment owing to its high protein content, mainly for feeding larvae (grubs). Nectar and honey-drew[1] of blooms are also important nutriments for bee, particularly owing to their high energy content. Ruff (2007) describes in detail that self-inductor process, in the course of which the hive selects the most suitable pasture for it, which expresses in so-called bloom loyalty. The economic importance of bloom loyalty mainly appears in the fact that bees pollinate the same kind of crops in large numbers insuring the fertilization, while wild insects, pollinating organs visit different species, thus fertilization is doubtful. During the selection of bee pasture the most important aspect for the bees

[1]In consequence of the inadequate plant protection of sunflower aphides can proliferate, which pass high sugar content moisture to the plant during their secretion.

is the quality, quantity of the harvestable nutriment and the distance of it from the hive.

All that generate that bees visit certain blooming cultures with higher intensity – owing to the above-mentioned aspects –, in spite of the fact that more different blooming cultures bloom at the same time. Simultaneously with the blooming of economically important oil crops other wild relatives bloom very rarely, thus competition mostly emerges between certain species and hybrids. As a consequence of the above-mentioned, from two sunflower- or rape fields bees will visit more often that providing more and better nectar and pollen. So it can be seen that pollination is more certain on field proving to be better bee pasture, thus yield safety is larger, which finally improves the efficiency of cultivation practice and reduces the specific costs of that. The situation of Hungary can be considered very favourable as regards pollination; its bee density is almost 10 bee hives/km^2 on an average of the total area of the country. In Hungary 70% of the 16 000 beekeeping farms are wandering beekeepers, thus the above-mentioned bee density concentrates further during the blooming of oil crops securing pollination.

Results of the questionnaire survey made by Kovács in 2010 present that beekeepers in Eastern-Hungary, within that in Békés County mostly have three wandering destinations. In chronological order the first one is rape, the second one is acacia and the third one is sunflower. In Békés County 87% of beekeepers are wandering beekeepers. The high ratio of wandering beekeepers is favourable as regards the pollination of oil crops, since the mobility of bee hives is a key issue in order to develop the bee density referring to the sowing area of oil crops that can be considered ideal as regards fertilization. The aforementioned tendency is also typical in the other member states of the European Union, which practically excludes for the beekeeping industry the opportunity that the beekeepers in the EU countries obtain income as a compensation for pollination. Kevan et al. (2008) explains that the pollinating activity of bees is rather underestimated. Countries possessing large bee density take pollination for granted. In contradiction for example to the USA and to those countries where crop production can be characterised by extensive monocultures and lower bee density is typical in beekeeping industry. There farmers not only accept, but also give material support for beekeepers in order that they settle down their cultivated crops. The fact was contributed to this that between September 2007 and March 2008 36% of the hives of that place became depopulated, but in certain beekeeping farms damage reached 90%. The absence of beneficent "activity" of bees in pollination resulted in serious damages.

It can be expected in the future that sunflower-seed oil production will increasingly serve the utilisation of energetic purpose beside the demand of food- and chemical industry. It can be particularly true in those areas where climate does not open the door to safe and economical production of rape, such as in the eastern part of Hungary or in the drier, warmer area of South-European countries.

4. The role of oil crops in production structure of beekeeping sector

On the basis of literature data (Lampeitl, 2009, Ruff, 2007) 1 ha oil crop gives an average quantity, but not a negligible amount of honey, which expected volume is the following:

- Sunflower: 80–100 kg/ha;
- Coleseed: 50–60 kg/ha.

Table 2. demonstrates that rape and sunflower give minimum 25% of the produced honey in Hungary. It has to be realized that there is significant fluctuation in produced quantity of certain honeys. In those years when conditions was less favourable to acacia-honey production, the amount of honey being collected from oil crops attained 40% of the whole commodity supply as well. It can be clearly stated that oil crops are defining bee pastures beside acacia for beekeeping sector.

Table 2: **The structure of honey production and distribution**

Year	1999-2003	2004	2005	2006	2007	2008	2009
Production (t)	17 780	19 500	19 700	22 500	24 700	26 700	22 500
Ratio of honey types	%	%	%	%	%	%	%
Rape	11	19	19	9	18	12	5
Sunflower	14	11	18	30	12	30	20
Acacia, mixed blossom honey	75	70	63	61	70	58	75

Source: OMME (2007)

5. Introduction of the experiment

The main objective of the experiment is to explore the relations between beekeeping sector, within that bee density and sunflower sector. Considering that bee density in Hungary can be regarded high on a world scale (10 bee hives/ km^2), I tried to model low bee density by increasing distance between bee pasture and hive. This modelling method is made possible by the above-mentioned bloom loyalty and the preference order of bees. During the experiment I tried to find the answer for the following question: What an effect has bee density on sunflower sector?

5.1. Experimental conditions

The location of the experiment can be found in Southeast-Hungary, in the northern part of Békés County, in the southern boundary of Vésztő. The sunflower field initiated in the experiment is 60 ha large and its farthest point from the hives is 1.6 km far. The name of sunflower hybrid is LG 5658CL. On the north-western corner of the field 30 bee hives were introduced. In this way 2 bee hives/ha bee density was

modelled in the field. Locally, close by hives, where sampling also happened, the bee density is 10 bee hives/ha. Bee hives were located in hives of NB24 type, the name of bee breed is apis melifera carpatica. The next beekeeping farm around the table was 3.5 km far from the location of the experiment directly on the edge of an other sunflower field. The neighbouring beekeeping farm had altogether 90 bee hives, which also covered a sunflower field being in the same level of development as the initiated field and it was situated in 100 ha large area. It is important to emphasize that the total area of the experimental sunflower had smooth stand showing same level of development. In my view it was due to that weather conditions and the quality of the see-bed were optimal during the sowing-time.

5.2. Measurement methods

In the course of sampling I selected 20–20 sunflower plants in those third of the field which was the nearest (where the distance of the flowers from the hives was only 12–15 m) and in those which was the farthest (about 1590 m distance) from the hives leaving out the rotating area. These plants were labelled by ribbons strengthened to the lower part of their stems. The labelled plants had the same parameters, their height was between 115 and 125 cm, their blooming started on the same day, on 21 July in the calendar year. The reason why I counted the numbers of bees on the blooms in the next 15 days between 9 and 10 a.m. and 3 and 4 p.m., was that flowering of sunflower tipically about a forthight-long. Based on Pesti (1976), secretion of nectar from sunflower reach its maximum in every 4 hour, between 9–10 a.m. and at about 1 p.m. For the sake of avoiding the distortion of my tests during the above-mentioned two day-periods I averaged the results of the two numbering in the case of every bloom and sample.

On the ninth day it was rainy in the afternoon, thus data of this day showed negative outliers. On the basis of data provided by the instruments of the harvesting combine I found that yields were smooth on the whole area of the field. The average yield was 2.8 t/ha on the field. According to the instruments of the combine the lowest yield was 2.65 t/ha, while the highest value was 2.9 t/ha, this suggests that pollination completely happened on the whole area of the field. Data collected by sampling presented normal distribution, which opened the door to examine the two sampling numbers by two-sample T-test (*Table 3.*). Line chart was used for explaining results (*Figure 3.*), since I judge it can present my consequences in the most expressive way.

5.3. Results and discussions

Two-sample T-test (*Table 3.*) presents significance of 0.84 value by 5% error band, which indicates very close connection between the two sample numbers. It confirms the fact that pollination happened in the whole area of the field and it can be explained by the fact that there was higher bee density in the whole area of the parcel in comparison with the country average that can be considered high on a world scale as well (Zajácz 2011.)

As the result of statistical test does not describe the importance of relations between bee density and pollination for crop cultivation in itself, analyses of trends presented by two sample numbers is also necessary (*Figure 3.*) Graphs on *Figure 3.* include similar values, which is equal to the result of two-sample T-test. However from a practical point of view a significant difference can be investigated, the graph indicating the number of bees being counted on far blooms takes the value of the graph indicating the number of bees being observed on near blooms with a fed day difference. It is practical to write the trend function of the two graphs and compare their zero points in order to determine the degree of differences.

The equation of trend function in the case of near blooms:

$$Y' = -0{,}0403x^2 + 0{,}6362x - 0{,}4613$$

zero points: $\mathbf{x'_1=0{,}76}$ and $\mathbf{x'_2=15{,}02}$

Table 3.: **Two-sample T-test**

Group Statistics					
	Distance	N	Mean	Std. Deviation	Std. Error Mean
Bee density	Near	15	1.293	0.7755	0.2002
	Far	15	1.243	0.6100	0.1575

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. 2-	Mean Difference	Std. Error Difference	Lower	Upper
bee density	Equal variances assumed	1,198	0,283	0,196	28	0,846	0,05	0,2548	-0,4719	0,5719
	Equal variances not assumed			0,196	26,527	0,846	0,05	0,2548	-0,4732	0,5732

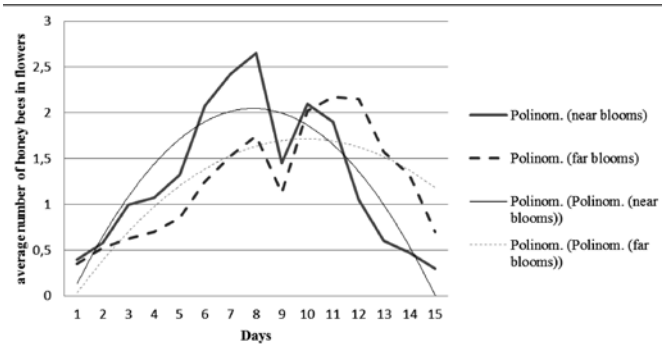

Figure 3: Pollinating activity of bees

The equation of trend function in the case of far blooms:

$$Y'' = -0{,}021x^2 + 0{,}4174x - 0{,}3623$$

zero points: $x''_1=0{,}91$ and $x''_2=18{,}97$

$\mathbf{x_1}$ zero points indicate the start of pollination on the x-axis, and $\mathbf{x_2}$ zero points indicate the finish of pollination. It shows that pollination happened about 4 days earlier on near blooms than on far blooms having relatively lower bee density. From crop cultivation point of view it means that higher bee density increase pollination. Increase of yield safety is primarily attained by decreasing risks of pollinating activity. It can be supposed that pollination can even more pass beside lower bee density and by increasing distance between bee pastures and hives exposing sunflower production to any more risks. Pollination lasted 19 days on the sunflower field being under experiment. It is a feature of sunflower that it is blooming through 10–15 days under ideal conditions, but it can even wait for pollination until 2 weeks (Frank 2012). By increase of waiting period the harvesting time is also postponed. The prospect of fertilization is minimal on the expiration of 3 weeks. During the experiment period conditions were favourable for the examined sunflower stand, thus pollination happened within 15 days on near blooms, where 10 bee hives/ha bee density was modelled. It follows from the foregoing that favourable effect of fast pollination emerges not only in assuring yield, but it also increases the safety of harvesting. The reason for this is that harvest of sunflower can be started potentially a week earlier on those areas where the level of bee density reaches 10 bee hives/ha in contradiction to areas where bee density is lower than 2 beehives/ha. The economic advantage of it is that the chance of the quality and quantity damage of different fungus infections decreases and more time remains for completing cultivation and sowing. Consequently earlier harvesting has favourable effect on the quality of sunflower achene and it assures more possibility to evolve an optimal sowing structure.

1 ha sunflower supplies 80–100 kg honey on an average (Lampeitl, 2009, Ruff, 2007). In compliance with the questionnaire survey of KOVACS carried out in 2010 the beekeeping farms in North-Békés annually produce almost 50 kg sunflower honey per bee hive on an average. Consequently in beekeeping sector there is no honey yield loss from the competition among bee hives beside 2 bee hives/ha bee density. According to the experimental experience at the same level pollination is also carried out in 19 days. Considering the above-mentioned facts it can be stated that in the case of sunflower the evolution of 2 bee hives/ha bee density can be considered optimal in terms of beekeeping and crop cultivation. In case of higher bee density specific honey yield can decrease, on the other hand in case of lower bee density yield loss can emerge in sunflower sector.

6. Summary

Nowadays the demand for energy and food of the growing world population has been rather increasing. Owing to the bees we can produce not only an energy source but also honey – a very significant food – on the same area. Considering that the energy sources are limited we have to pay increasing attention to the rational and efficient use of our existing sources. In crop cultivation external environmental conditions have a great influence on the efficiency of different agro-technological elements. Bees can play important role in decreasing these environmental risks and ensuring the efficiency of the applied technological elements. As regards pollination the weather risk expresses in the stop of pollination, since in cold and rainy weather bees do not leave their hives. From crop cultivation point of view it means that the chance increases for getting unproductive blooms. By 10 bee hives/ha bee density the generative life cycle of sunflower is shorter by around 30% than in case of lower bee density than 2 bee hives/ha. Hereby harvesting can also happen earlier, which has a favourable effect on the quantity and quality parameters of sunflower achene, that can help with evolving optimal sowing structure in that way it makes easier the work organization of cultivation and sowing. During my research I found that as regards beekeeping and sunflower sector the evolution of 2 bee hives/ha bee density can be considered optimal in Hungary.

On the basis of the experiment I suggest that during the purification of sunflower the quantity and quality feature of nectar producing capacity should be an additional standpoint beside the primary measure of value properties. The more nectar a crop is able to produce, the more bee hives can be applied on the sowing area of sunflower, thus it leads to faster pollination and more safety sunflower production. In the course of experiment I managed to establish that the evolution of 2 bee hives/ha bee density does not induce any problem for the member of domestic beekeeping sector due to the high level of mobility and the large number of wandering beekeepers. This explains the fact why pollination can not be sold as a service in Hungary and in area being characterised by similar bee density. The direct economic advantage of pollination is the value of harvested honey, but it can be resulted - indirectly – significant reduction in the quality of oil seed in case of insufficient number of bees. The determination of the lowest bee density beside that yield loss emerges owing to the lack of pollination requires further examinations.

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DISCIPLINES AND PRACTICES FOR SELECTION AND WORKPLACE ORIENTATION WITHIN AN AMERICAN COMPANY

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Abstract: The primary objective of this essay is to present how selection and orientation at the workplace are regulated and practiced at an American profit oriented company. Moreover, considering these practices to outline the disciplines which determine and influence them. The first part of this essay is a literature review which specifically illustrates various perspectives of selection and orientation at the workplace. Following this review, the objectives of this paper are enumerated. The next part presents the case study, the half-structured interview and the questionnaire methods used for this research. The results and the discussion parts are separated, because the results part shows how selection and orientation work in practice and then, by examining the results in some detail, the discussion part presents the disciplines which have been extrapolated. In order to support the conceived disciplines this paper also seeks to examine the most important supporting factors in the procedure of work orientation. General and professional/organizational factors of workplace orientation have been collected. Quantitative data from an empirical analysis is used for the research. Qualitative data is a part of a future dissertation. Questionnaires were completed by 80 employees at a distributor company in the United States of America.
The results clearly show that the following disciplines should be maintained through these HR processes: equal opportunity, importance of professionalism, documentary, checking, support and continuance.

Keywords: human resource management, selection, workplace orientation, workplace socialization, American HR practices, American HR disciplines

Introdution

In this part of the paper the selection and the orientation process are introduced and the objectives of this study are also clearly identified.

The selection process is complex procedure which has many aspects or dimensions. There are some authors who emphasize the importance of correspondence between the applicant's competences and the position/organization. Rothwell & Kazanas (2003) specify the selection as a process of searching for and then identifying an appropriate math between the individual, the job, the work group and the organization. Jackson et. al. (2012) defines selection as a process of obtaining and using information about job applicants to determine who should be hired for long- or short-term positions. It begins with an assessment of the requirements to be met by the new hire, including the technical aspects of a job and the more difficult to quantify organizational needs.

Gareth (2004) also suggests that the selection process is about matching people to roles. Actually, the selection process is about getting information about the applicants in order to find the right person. The steps of the selection are the following (Farkas 2007; Száraz 2004):

- checking CV-s,
- informing the applicants (every applicant receives a response: rejecting or calling for an interview)
- interviewing and using, assessment centers, tests, references all to gain as much information as possible about the applicants,
- introducing the workplace for the best applicants (opportunity for the employers and also for the applicants to get information),
- evaluating and making the decision,
- informing the applicants about the decision,
- writing the work contract.

Other authors also strongly highlight the meaning of correspondence but they stress the importance of legal requirements, too.

Catano (2009) suggests that the selection is the choice of job candidates from a previously generated applicant pool

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in a way that will meet management goals and objectives as well as current legal requirements. Gatewood et. al (2010) specifies the selection as a process of collecting and evaluating information about an individual in order to extend an offer of employment. Such employment could be either a first position for a new employee or a different position for a current employee. This selection process is performed under legal and environmental constraints and addresses the future interests of the organization and of the individual.

Other scholars emphasize that the selection should link with the strategic business plan. The stage of an organization's development (that is, whether it is just starting up, in a growth phase, merging with another company, or even in temporary decline) will indicate the numbers and types of employees it requires in both the short and longer terms (Compton et. al. 2009). Actually, a vital part of the strategic business plan is the HR planning component which is where the recruitment and selection cycle begins (Marchington & Wilkingson 2005).

In my view the selection process can ultimately be summarized as the steps in identifying exactly what is needed (soft and hard competences) from the occupant of the new position and selecting the person who matches the role. During the selection the current legal requirements must be considered. The selection process has a short and a long-term goal. The short-term goal is to divide work tasks more effectively with the help of new workforce. The long term goal of the selection process is to assist the business plan with supporting and realizing the goals of HR planning.

Many literatures can be found on work and/or workplace socialization from the '70s until the present and most of the authors emphasize the importance of learning. When it comes to learning during work socialization, Feldman (1976), Fisher (1986) and Reichers (1987) differentiate four dimensions or tasks of the learning process:

(a) task mastery: learning how to do the components of one's job, needed skills and knowledge,
(b) learning about the organizational culture, values and goals,
(c) understanding one's role in the organization (identity, self-image and motives)
(d) social integration: developing relationships with co-workers, friendships.

Recent definitions from other authors also stress the goals of new employee learning. Haueter et al. (2003) and Saks et al. (2007) specify work socialization as a procedure, through which employees acquire information, knowledge on how to adapt to new jobs, roles, work groups and the culture of the organization in order to be a useful member of an organization.

Workplace socialization reviews examine the process from the side of the newly hired employee, while orientation literature studies the issue from the side of the organization. Nyambegera (2005) defines orientation as a procedure is intended to help new employees to settle into their job. Other scholars try to find practices and tools to orient and integrate the employee. Arthur (2006) suggests that open door communication and open door policy play an important role in departmental orientation. Patient and empathy especially from the buddy or mentor (Internet1) and support and commitment from management is also critical (Westwood 2005). Lawson (2006) mentions that arranging free-time activities like going on breaks and lunches helps the orientation process.

As the literature showed, in order for the learning process to be successful, the organization, the management and the employees need to ensure some general conditions for the newcomer, like patience, open door policy, empathy, leadership/management support, free-time activities. In addition, some professional maintain is needed specifically for the task mastery, like feedback, professional support and sharing of experiences. Moreover, a proper organizational information and communication system needs to be in place and information about the organization's goals should be clearly accessible, so that the culture can become more easily known.

In order to clearly determine the HR/direct manager tasks through the newcomer's orientation, a separation in the process is needed.

My explanation for the orientation at the workplace includes two parts: a formal and an informal part. The formal part essentially contains the documentation for which there are legal and/or organizational requirements. The informal part of the orientation process has three important factors:

1. Task acquisition in practice: knowing the tasks on a daily basis and the way these should be accomplished – the ability to work independently and the realization of the added value to the organization;
2. Contact creation: getting to know the direct co-workers and managers, building connection networks at the workplace and fitting in the hierarchical system;
3. Organizational culture: getting to know the organizational habits, values, rules and goals (Kozák 2012).

The HR and/or direct manager help the newcomer directly or indirectly in tasks acquisition, contract creation and getting to know the organizational culture.

My view for the workplace orientation task is an organizational psychology's perspective: not the newcomer's socialization for the work in general or for that special position. My view is a more complex procedure, namely the orientation at the organizational level. Orientation at the workplace is a process through the newcomer – if its his/her first workplace, adapting to the work as well – gets to know, sees through and accomplishes completely his/her tasks, realizes that his/her work became value for the organization, builds network contract and finally gets to know, accepts and integrates in the organizational culture. The work socialization, the socialization for the current position and the orientation at the workplace cannot be separated; these are different sides of the same process. During adapting to the work or working in a new position, the orientation at the workplace is happened too, because the organizational norms and habits became known as well.

As the literature showed, the selection and the orientation processes are complex procedures with many tasks and assignments which are managed by the HR and/or the direct manager. Although the literature clearly defined each steps of

the processes, there are less attention how to realize them in practice.

The objectives of this study are the following:

- Present how selection and orientation tasks and assignments are carried out in practice,
- Find out the disciplines which determine and influence the tasks, and
- Discover the most important supporting conditions in the process of workplace orientation.

Also based on the literature review the following hypotheses are set up:

Hypothesis1: The steps of selection and orientation process are clear and well-organized, also legal requirement (like equal opportunity and avoiding discrimination) play an important role in the processes at the company.

Hypothesis2: General factors are important as much as professional/organizational factors in the process of workplace orientation.

Materials and methods

The methods used in this analysis of the selection and orientation process included a case study, a half-structured interview and a questionnaire.

With the use of a case study the author had an opportunity to make observations and use the company's own documents (especially the manager's and the employee's handbook) for analysis.

The interview was conducted with the company's HR manager who was responsible for the selection and indirectly for the orientation process. The questions for the half-structured interview were collected after the literature and the company's documents review. The questions were asked about the following topics: who is responsible for selection and orientation; steps of these procedures; special attention during these processes; documents and forms; tools to support orientation; mentoring system.

The questionnaire consisted of 13 questions; each question included 10 sub-questions. Respondents evaluated each sub-questions with the help of the following scale: 1) not important, 2) somewhat important, 3) important, 4) fairly important, 5) crucial. One of the 13 questions was about the orientation process. General and professional/organizational factors of orientation process have differentiated. Patience, open door policy, empathy, free time activities and leadership/management support were general factors. Feedback, professional help and the sharing of experiences are professional factors. Information about the organization's goals and the proper organizational information and communication system were organizational factors.

Questionnaires were distributed with simple random sampling to 80 employees of a distribution company in the United States of America. Almost two-thirds (59%) of the employees were male, 50% had collage or master level, all of the respondents worked full time and 41% were in managerial position. The generational distribution of employees was the following: 28% belong to the Y generation (between 18 and 29 years old), 42% belong to the X generation (between 30 and 47 years old) and 30% were Baby Boomers (between 48 and 65 years old).

Results

In this part of the essay, the results of the analysis for the selection and orientation at the workplace are presented. First, the details of selection are pointed out with the tool of case study and half-structured interview. Then the details of workplace orientation are illustrated with the tool of case study, half structured interview and questionnaire.

There is an American service to provide information for organizations about the current employees' and candidates' driving license (this report is the Motor Vehicle Record). If the driving license is necessary for the job, employers can check it for fee.

The interview technique that was used depended on the new position (there are no recommendations about it in the managers' handbook), but the whole interview process is documented. Before the interview the candidates should fill a form which begins with the following sentence: "we do not discriminate on the basis of race, colour, religion, national origin, sex, age, disability, or any other status protected by law or regulations It is our intention that all qualified applicants be given equal opportunity and that selection decisions be based on job-related factors". This form asks questions about general personal details (about age: are you 18 years of age or older? possible answers: yes or no), educational background, special skills, previous workplaces (name and contact information of their previous supervisors). Applicants also should fill the Form I-9, Employment Eligibility Verification by the U.S. Citizenship and Immigration Services.

The managers' handbook contains directions about the questions they should and should not ask during the interview. Employers should not ask the candidates' age or birth date, place of birth, address, religion, maiden name or his/her father's name, material status, kids, account details, record (clean or not), mental or physical illness, foreign languages, free time activities, number of days in sick leave, and others.

After the interview the managers call the candidate's previous supervisors and ask them about the candidate. The manager's handbook contains a form to guide the interviewer in asking the right questions, for example, what did she/he like/dislike about previous jobs; what did she/he think of his/her previous supervisors; what were his/her wages at previous jobs; and others. All of the listed question based on work-related factors.

There are two types of employment contracts in the United States of America: at-will and just-cause. An „at-will employee can be terminated at any time and for any reason, or for no reason at all, with or without notice" (Kaiser, 2005). A "just-cause" employee means having legitimate reason to invoke formal discipline. It means a real cause or basis for dismissal as distinguished from an arbitrary whim or caprice;

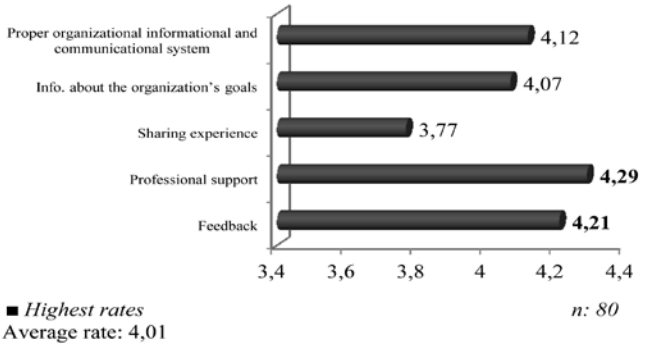
that is, some cause or ground that a reasonable employer, acting in good faith in similar circumstances, would regard as a good and sufficient basis for terminating the services of an employee (’Lectric Law Library). At the company used in this study, all of the employees are hired at the will of the employer and the employment may be terminated at any time, with or without reason and with or without notice.

The candidate who is selected is informed by the HR manager who then presents the employee handbook, the job description and the employment agreement to the newcomer. The applicant has a few days to peruse those documents and then the HR manager presents the orientation training to him/her. This training takes 3 or 4 hours (depends on the candidate’s questions) and during that time the selected candidate is informed about the organizational policies and disciplines, the company’s benefits and other useful organizational rules such as performance management at the company. The selected candidate then signs the job description, the employer agreement and all of the pages of employee handbook (which includes important documents like business ethics policy, absenteeism, and others). After signing the employment agreement the newly hired employee fills in the Ethnicity/Race Self Identification Form and the Personal Information Form. At this point, the paperwork or the formal part of the orientation process is complete.

In order to understand how these tasks are performed on a daily basis and the way they should be accomplished at the company, it is essential to get to know some work conditions and specifications. The supervisor’s handbook contains a checklist what should be covered on the first day: building access and alarm code (as applicable), breaks, how to order office supplies, how to use the phone system, how to use the copier, fax, printer, etc., basics of the job, how to use the computer system, where the rest rooms, emergency exits and fire-alarms are, and other matters. After the newly hired employee receives the required information the supervisor and the newcomer sign the checklist. On the first day of work the new employee is introduced to the trainer or mentor who will be responsible for the professional orientation. Furthermore, the supervisor should check with the new hire at end of first day, first week, first 30 days, etc to see how it’s going. The employee then moves progressively to greater levels of independence. In the beginning the newly hired employee is observing, and then he/she is working independently but under control and finally she/he will work absolutely independently without control.

In order for the new hire to get to know the managers, it is customary for the supervisor to take the new hire to lunch on the first day or second day (but definitely during the first week. The supervisor should make sure the newcomer has a lunch buddy during the first week. Giving the new hire a quick tour of the office is also the supervisor’s responsibility as well as introducing other employees they will likely work with and making sure they know who to go to with any types of questions.

During the process of workplace orientation the newcomer needs professional and general support. *Figure 1* shows the results concerning the importance of professional/organization employment factors during the process of orientation at the workplace.



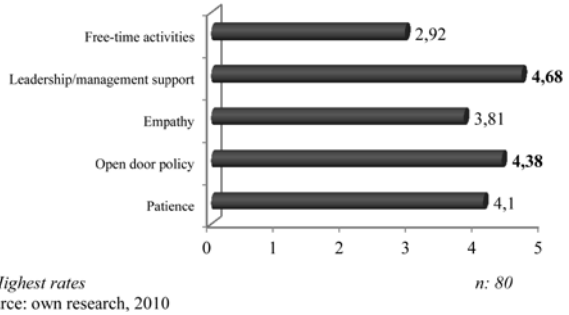
Average rate: 4,01
Source: own research, 2010

Figure 1: Results concerning the importance of professional/organizational factors during the process of orientation at the workplace (averages values, scale 1–5)

Professional support and feedback were evaluated as the highest professional/organizational factors. Professional support and feedback are given by the supervisor and or the mentor. These are absolutely professional factors as much as the sharing experience, which was the lowest evaluated factor. Proper organizational informational and communication systems and information about the organization’s goals are dependent on the organizational culture and they become more important after the orientation.

Figure 2 shows the results concerning the importance of general factors during the process of orientation at the workplace.

Leadership/management support and open door policy



Source: own research, 2010
Average rate: 3,98

Figure 2: Results concerning the importance of general factors during the process of orientation at the workplace

were evaluated as highest, while free time activities was the lowest evaluated factor. The leadership/management support is mostly depending on the supervisor’s personality, while organizational culture emphasizes the open door policy. Free-time activities help to build contacts at the workplace, but good professional relationships are created at the office during work hours. Patience and empathy are also rather personal characteristics, not professional skills.

General factors were evaluated approximately same important (average rate: 3,98) as professional/organizational factors (average rate: 4,01).

Discussion

In this part of the study the disciplines for selection and orientation at the workplace are introduced. These disciplines are listed considering the results of the research.

1. **Equal opportunity** is one of the most important principles during the process of selection. In order to find the best candidate for the position the company should ensure equal opportunity for all applicants. Equal opportunity is not only about avoiding the discrimination, but also setting up objective requirements before and during the process of hiring.
   a. **Avoiding discrimination:** Discrimination issues are significant for all businesses because there are several legal requirements for that. It should be noted that companies should pay attention to indirect discrimination, too, when happens when the act is not discriminatory in itself, but it has the effect of discriminating against key groups.
   b. **Setting up objective requirements:** First of all, businesses should analyze the competencies relevant to the position. The hiring manager should first determine the hard and soft skills which are required for the job; considering those competencies, the manager should refresh the job description and select CV's with the focus on matching the skills with the position. Secondly, objective requirements are important during the process of workplace orientation, too. Mentors and supervisors should have patience and empathy with the newly hired employee. They should let the newcomer clearly know what the requirements are and how much time she/he to accomplish them.
2. **The importance of professional:** Focusing on the professional issues is necessary during the hiring and workplace orientation process. The importance of professionalism through the hiring process is strongly connected to the equal opportunity discipline, but it is different for the period of workplace orientation. Considering the results of the survey newly hired employees evaluated the professional factors as more important than the organizational culture factors, therefore mentors and supervisors should primarily focus on the professional orientation.
3. **Documentation:** All of the steps of the hiring and orientation process should be documented. Proper and complete documentation ensures a protection for businesses and for newly hired employees as well. It is also useful for HR processes because it assists the personal registry at the company.
4. **Background Checking:** Background checking is a part of the selection and orientation process. Asking for the Motor Vehicle Record (if it is necessary for the position) and calling the candidate's previous supervisors are required in the hiring process. Checking is also important in the workplace orientation process, supervisors and mentors should check the newly hired employee's work and conformity from time to time.
5. **Support:** professional support, leadership/management support and feedback are important for newly hired employees. Supervisors and HR management should consider that the younger generation usually relies on the senior staff and the older age group rather than the direct supervisor. After checking the newly hired employee's work from time to time mentors and/or supervisors should give them feedback and let them know what was correct and/or what should be changed (if it is necessary).
6. **Continuance:** This discipline means that the steps of the hiring and orientation processes are clearly defined and the steps follow each other. There are no unnecessary steps, no wasted time, and everything is well-organized. This continuance is a money saving bonus for businesses and useful for newly hired employees too since the orientation process ends sooner.

These disciplines are independent, but connected to each other. They articulate principles that recognize that, while the hiring and orientation process is a complex procedure, it works effectively and efficiently when well organized. Although these specific disciplines have been extracted from American business practice they can be adapted to other countries as well.

Acknowledgements

The goal of this study was to present how the selection and orientation processes are regulated and practiced at an American business. This essay also examined the various components or aspects of selection and workplace orientation from the perspective of both individual and organizational needs. Finally, the author's views and analysis of these processes are defined as well.

In order to undertake this analysis, the author used a case study, a half-structured interview and a questionnaire as research methods. With the tool of case study the author had an opportunity to make observations and use the company's own documents (especially the manager's and the employee's handbook) for analysis. The interview was made with the company's HR manager who was responsible for the selection and indirectly for the orientation process. Questionnaires were distributed to 80 employees of a distribution company in the United States of America. With the tool of questionnaire the author discover the employees needs and experiences through the hiring and orientation process. The results showed that the following disciplines should be maintained through these HR processes: equal opportunity, importance of professional, documentary, checking, support and continuance. These disciplines are deduced from the American practice but can be adapted to other countries as well.

Both of hypotheses are verified:

Answer 1: The steps of selection and orientation process are clear and well-organized, also legal requirement (like equal opportunity and avoiding discrimination) play an important role in the processes at the company.

Answer 2: General factors are important as much as professional/organizational factors in the process of workplace orientation.

Empirical analysis used for the research is a part of a future PhD dissertation which aimed to find out the similarities and differences in orientation process between American and Hungarian companies.

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VERTICAL PRICE TRANSMISSION ANALYSIS: THE CASE OF MILK IN THE SLOVAK DAIRY SECTOR

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Abstract: Testing for nature price transmission and calculating elasticities of price transmission are important areas of research for providing insights into market efficiency issues. Symmetric or asymmetric price transmission has been the subject of considerable attention in agricultural economics. The concept of the price transmission is an important area of the research particularly in relation to the assessment of impact on the welfare of the vertical entities. The main goal of the paper is an analysis of the price transmission and its exploitation in case of price elasticity estimation in dairy sector. Work investigates vertical price transmission of milk in the Slovak agri-food chain. The research is based on Vector Error Correction Model (VECM) of the selected commodities at producer, processor and consumer level and the estimation of the parameters specified in the model. Moreover the paper determines the coefficient of elasticity of price transmission (EPT).

Key words: dairy sector, elasticity, milk, price transmission

Introduction

Price transmission in agricultural markets has been a subject of numerous studies and asymmetry in price transmission has been detected in most of agricultural products markets.

Bakucs et. al. (2012) explains that there is some evidence that asymmetries are found more often for livestock rather than crop products. Also Popovics (2008) confirms and quantifies that the Hungarian dairy market is under an oligopoly and asymmetric price development prevails in the whole chain and in the specific stages as well, but the appearance of these effects is different in the specific stages. Furthermore, the effects of price increases are more intense in the retail than in the processing stage. Similar results were found by Matulová et. al. (2010), where due to the oligopsonistic dairies market structure the dairies transfer mainly the negative price changes to the farmers and the asymmetric price transmission is cause by the existence of imperfect market competition within the Czech dairy sector. They also supposed the influence of producer price on agricultural price is driven mainly by the relationship between the dairies and the wholesalers. An analysis made by Jaffry and Grigoryev (2011) came up to conclusion that DEFRA (average UK farm-gate prices) and AMPRE had a long-run relationship. Another interesting finding is that the adjustment from farm-gate (DEFRA) prices to the AMPE prices was symmetric but adjustment from AMPE to farm-gate prices was asymmetric. In the liquid milk market, an important finding was that the wholesaler's response was shifting towards an asymmetric response against the farmers as well against the retailers for certain chains. Houck's method applied by Kinnucan and Forker (1987) revealed asymmetry in the farm-retail price-transmission process in the dairy industry. Results indicated that retail dairy product prices adjusted more rapidly and fully to increases in the farm price of milk than to decreases. The reasons suggested for the observed price asymmetry include: industry concentration; government price support activities; and/or whether marketing margin changes are due to retail-level demand shifts or farm-level supply shifts. Jensen and Møller (2007) found out that from wholesale to retail, the price transmission is strong and symmetric in the long run (80–85%) for milk, however in the short run, price transmission is asymmetric. Relationships and patterns of transmission among farm and retail markets were analysed by Serra and Goodwin (2002), using both weekly and monthly price data of dairy products in Spain. They found out that, the transmission of shocks appears to be largely unidirectional when weekly data is used: retail prices adjust to farm level shocks to the raw milk price, but the milk price only modestly responds to retail market shocks. On the other hand, farm prices appear to be more elastic to shocks to retail prices with monthly data, indicating that milk prices require a considerable long period to adjust. Additionally, when weekly data are used, formal testing suggests the presence of asymmetries in vertical price transmission patterns for some manufactured dairy products with a relatively long shelf life. However, they concluded that asymmetries are not present in the price transmission of highly perishable dairy products.

Over the last three decades surveys for analyzing price transmission have been mainly based on variable-splitting technique developed by Wolffframand whose technique was

later adapted by Houck and Ward (Maghaddasi, 2009). In Houck´s method asymmetric price transmission is examined by price variables divided into decreasing and increasing stages (Shadmehri Ahmadi and Ahmadi, 2010). Vavra and Goodwin (2005) explain that Houck's method was extended by Ward (1982) who included lags of exogenous variables variables such that the delay in effects and the length of lags can differ depending on whether the causal price is increasing or decreasing. Boyd and Brorsen (1988) were the first to use lags to differentiate between the magnitude and the speed of transmission. These techniques were called the pre-cointegration techniques. Von Cramon-Taubadel and Fahlbusch (1994) pointed out that an asymmetric error correction model (ECM) based on the work of Granger and Lee (1989) could be used to test for asymmetric price transmission. Cramon-Taubadel and Loy (1999) also came to conclusion that this method was more appropriate than using the Houck approach if the price data were co-integrated. This method allows for asymmetric adjustments by distinguishing between positive and negative shocks to error correction terms (Capps and Sherwell, 2007). An alternative error correction specification is threshold autoregressive (TAR) model that recognizes the fact that a shock may have to reach a critical level before a significant response is done (Jeffry and Shabbar, 2004).

Materials and methods

The aim of this paper is to investigate and analyze the nature of price transmission mechanism between farm-processor and processor-retail marketing channels in the Slovak dairy market. Vertical price transmission analysis is performed in order to identify important features of the market functioning and potential market failures. More specifically, the paper describes the relationship between prices (Hupková-Bielik-Turčeková, 2009), calculates the long-run elasticity of price transmission (Lechanová-Bečvářová, 2006; Šobrová, 2009), focuses on the speed of the adjustment process, tests the direction of causality (Palkovič-Sojková, 2012) and provides evidence of symmetric or asymmetric price transmission in the dairy sector.

With respect to the main goal, the paper analyses the behavior of variety of common tests for evaluating vertical price transmission. Firstly, the descriptive statistics is applied in order to describe the main features of a data collection and examine the relationship between farm-gate and processor prices and on the other hand between processor and consumer prices. Prior to ensure that estimation of the price relations is not miss-specified, it is important to test stationarity of the selected time series by the Augmented Dickey-Fuller test (ADF). Therefore, for each pair of prices the analysis consists of the following steps:

1. The Augmented Dickey-Fuller (ADF) test is done in order to test the price variables to see if they are non-stationary (I (1)). The number of lagged difference terms is chosen based on Akaike information criterion (AIC), Schwartz-Bayesian criterion (SBC) or Hannan-Quinn information criterion (HQC) (Šobrová-Čechura, 2009),
2. The standard Engle-Granger and Johansen test is applied to determine whether the two series are co-integrated, meaning that each variable is non-stationary (I(1)) and a linear combination of the two variables is stationary (I(0)) (Ferto and Bakucs, 2005).
3. If the presence of a long-run relationship between variables is detected, then the Vector Error Correction model (VECM) is estimated. According to Mazur (2006), standard co-integrated VECM model for p variables with k lags in the original VAR model and normal errors can be written as:

$$\Delta x_t = \Pi x^*_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-i} + \Psi g_t + \varepsilon_t, \quad \varepsilon_t \sim iiN(0,\Omega)$$

where:

$$\Pi = \alpha\beta', \; x^*_{t-1} = (x_{t-1}', d_t')', \; rank(\Pi) = r, \; 0 < r < m,$$

and d_t are deterministic terms restricted to the co-integration space, whereas g_t represents unrestricted deterministic components; α and β are assumed to have full column rank equal to r. In the setting it is assumed that all variables in x_t are I(1) non-stationary, so I(2) and seasonal non-stationarity and co-integration are ruled out for simplicity. Ω is assumed non-singular, initial condition matrix X_0 is assumed non-random. Elements of α and β represent long-run dynamics of the system: columns of β are interpreted as co-integrating vectors, whereas elements of α transfer impact of deviations from long-run equilibrium onto current dynamics of the variables. Long-run weak exogeneity of variables in the system results in zero restrictions on the corresponding rows of α. Long-run exogeneity is tested by the significance of the error correction terms in the equations. Since the prices are expressed in logarithms for the price transmission analysis, the co-integration factor (β) is the long-run elasticity of the one price with respect to the second price. Thus, β is the long-run elasticity of price transmission.

Based on LLOYD et al., (2004) the market structure is competitive if and only if the price transmission elasticity is equal to 1. Oligopoly power is exercised if the price transmission elasticity is higher than 1 and oligopsony power is present if the price transmission elasticity is less than 1. There could also be the possibility of both oligopoly and oligopsony power.

Modeling oligopsony can supply unique results about the nature of relations in agri-food chains that help to understand, among other issues, how the markets are pushed into equilibrium states, what is the position of single elements in the chain, what is the competitiveness of farmers, what is the effect of agricultural policy and how is this effect in the chain distributed (Čechura 2006).

4. Vector Autoregressive approach (VAR) is performed to detect if one price does not Granger cause other price.
5. Dummy variable technique is used in order to find out symmetry or asymmetry of the selected time series. The results with a statistically insignificant ($p>0.05$) coefficient for the dummy variable indicate the asymmetric price transmission.

The data set covers the time period from January 2004 to December 2011. The time series for econometric research are analyzed after the Slovakia's accession to EU due to consistency of data and avoiding misleading interpretations which might occur in case of different nature of series, structural breaks and other factors. The monthly data were collected from The Research Institute of Agricultural and Food Economics online database www.vuepp.sk and from an online statistical database SLOVSTAT. The vertical price transimission analysis was performed by Gretl software.The following prices are used: farm-gate price of raw cow milk I. class (FPI), farm-gate price of raw cow milk Q class (FPQ), processor price of semi-fat milk in PE bags excl. VAT (PP), consumer price of pasteurized semi-fat milk incl. VAT (CP); (EUR/l).

Results and discussion

In this chapter the price transmission analysis will be taken between FPI and PP of semi-fat milk in PE bags, between FPQ and PP of semi-fat milk in PE bags, between PP of semi-fat milk in PE bags and CP of pasteurized semi-fat milk.

Figure 1 shows the development of producer price (FP) of raw cow milk I. class and Q class (EUR/l), processor price (PP) of semi-fat milk in PE bags(1l; excl. VAT) and consumer price (CP) of pasteurized semi-fat milk (1l; incl. VAT) in Slovak Republic (SR) during the period 2004–2011.

According to the main statistical characteristics of the analyzed time series shown in *Table 1,* the mean value of farm-gate price of raw cow milk I. class equals 0,28 EUR/l and price of raw cow milk in quality class Q equals 0,31 EUR/l. On the other hand the average value of processor price equals 0,43 EUR/l and approximately 0,66 EUR/l in case of consumer price. Based on the table it is clear that the relative variation in FPI is the highest comparing to other price time series. More specifically, the variation coefficient (C.V.) of farm-gate price of raw cow milk I. class reaches 16,95 per cent in case of monthly data, FPQ reaches 10,74 per cent, processor price time series equals 11,30 per cent and the variation coefficient of the consumer price series reached value of 7,49 per cent. The minimal value of FPI equals 0,18 EUR/l and 0,21 EUR/l in case of FPQ, while the maximal value of FPI reaches 0,36 EUR/l and FPQ equals 0,38 EUR/l. The extreme values of processor price show larger differences than extremes of farm-gate prices. The minimal value of processor price equals 0,33 EUR/l, while its maximal value equals 0,54 EUR/l. The minimum of consumer price equals 0,54 EUR/l whereas the maximum equals 0,75 EUR/l. Moreover, these extremes values- were not reached in the same periods. The minimum value of FPI was recorded during the period May-September 2009, while the minimum of processor price was reached in July and August 2009. Regarding to FPQ the minimum value was reached during the period August-September 2009. The minimum consumer price was reached in September and October in 2009. The maximum of farm-gate price in quality class I. was experienced from February 2008 to April 2008 as well as for farm gate price of raw cow milk Q. class. On the other hand, the maximum was recorded only in February 2008 in case of processor price. Regarding to consumer price, the maximum was reached from January 2008 to May 2008.

There is a high and positive correlation between producer and processor prices according to results from correlation analysis. Correlation between FPI and PP was 90,49% and between FPQ and PP was 88,00 %. Additionally, there is also positive correlation between processor and consumer prices (72,58%).

Table 1: Summary statistics, using the observations 2004:01–2011:12

Variable	Mean	Median	Minimum	Maximum	St. Dev.	C.V.
FPI	0,28448	0,31000	0,18000	0,36000	0,048229	0,16953
FPQ	0,31021	0,32000	0,21000	0,38000	0,033308	0,10737
PP	0,42656	0,44000	0,33000	0,54000	0,048184	0,11296
CP	0,65938	0,65000	0.54000	0,75000	0,049392	0,074908

Source: own calculations; http://vuepp.sk; http://www.statistics.sk/; FPI/raw cow milk I. class (EUR/l), FPQ/ raw cow milk Q. class; PP/semi-fat milk, in PE bags (1l); CP/pasteurized semi-fat milk (1l)

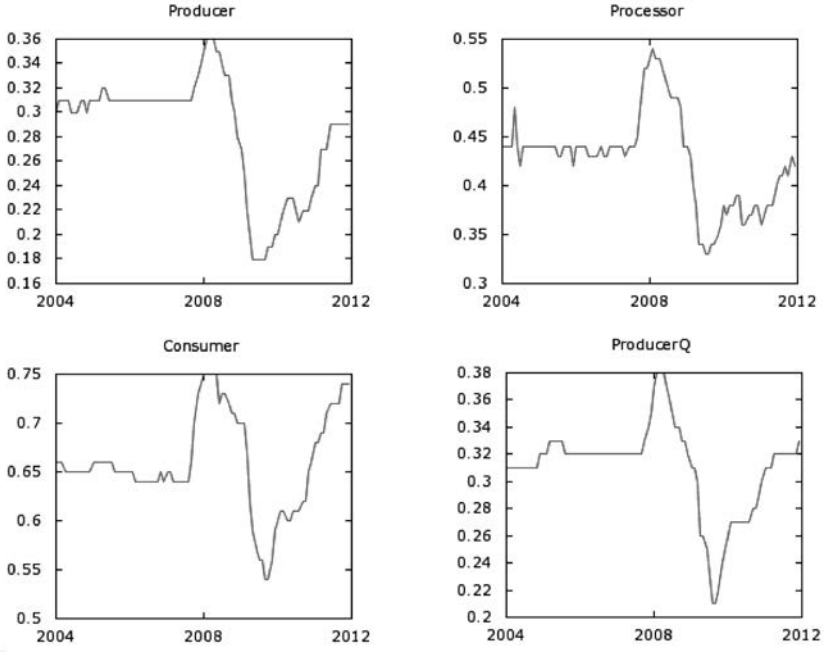

Figure 1: Development of FP, PP and CP prices of cow milk in SR (2004–2011)
Source: Own calculations; Producer/raw cow milk I. class (EUR/l), ProducerQ/raw cow milk Q class; Processor//semi-fat milk, in PE bags (1l); Consumer/pasteurized semi-fat milk(1l)

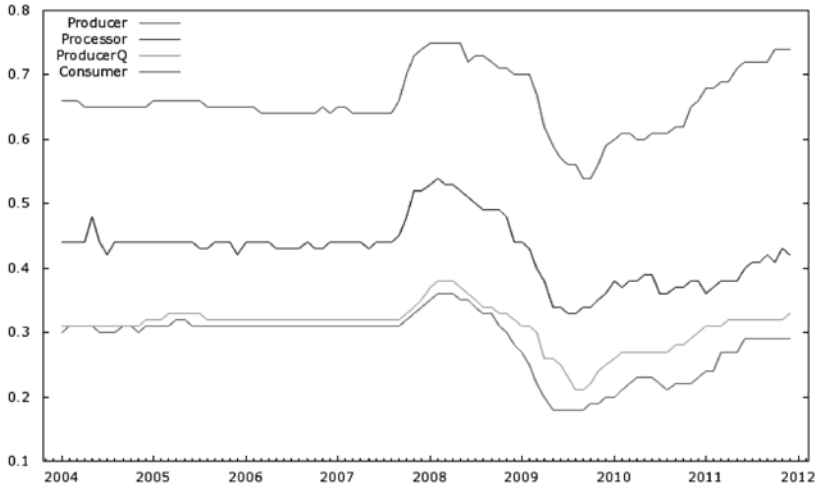

Figure 2: Development of producer, processor and consumer prices in SR (2004-2011)
Source: own calculations; producer/price of raw cow milk I. class (EUR/l), producerQ/price of raw cow milk O class; processor/ price of semi-fat milk, in PE bags (1l excl.VAT); consumer/ price of pasteurized semi-fat milk (1l) incl. VAT

As shown in *Figure 2,* all variables are clearly related (move together through examined time) and their means are not constant and seem to be not stationary, meaning that they appear to be I(1) and the test for unit roots was done to clarify this statement. The time series of monthly data were analyzed on 2 significant lagged values. Reports on estimated autocorrelation coefficient for the errors were small and revealed that the correct number of lags in the ADF was chosen based on Akaike criterion (AIC) and Hannan-Quinn criterion (HQC) and Schwartz Bayesian criterion (BIC). The null hypothesis of the ADF test is as follows: ´The time-series have a unit root and are not stationary´. The hypothesis was not rejected and ADF test confirms all selected time series to be non-stationary and integrated of the first order I(1) whereas their first differences were stationary at both 1 and 5 per cent significance levels, except first difference of FPI that was stationary only in test without constant. Rregarding to FPQ, the first difference was not stationary in test with constant and trend, see results in *Table 2.* Afterwards, Johansen and Engle Granger co-integration test were carried out for the time series which have unit roots.

***Table 2*:** ADF test

Variable	Augment Dickey Fuller test		
	without constant	with constant	with constant and trend
	p-value*	p-value*	p-value*
FPI	0,5103	0,2901	0,504
dif FPI	0,008297	0,08948	0,2714
FPQ	0,6802	0,2216	0,5139
dif FPQ	0,001396	0,02154	0,09093
PP	0,5753	0,4629	0,7031
dif PP	5,668e-005	0,001355	0,009037
CP	0,7388	0,1989	0,4742
dif CP	7,247e-005	0,001545	0,009378

Source: own calculations; lag length for ADF test =*2lags; FPI (farm-gate price of rawcow milk I. class); FPQ (farm-gate price of raw cow milk Q class); PP (producer price); CP (consumer price)

According to results obtained by ADF test, all the original time series were non-stationary and therefore they could be used for co-integration test. Based on Johansen test, variables FPI and PP are co-integrated. One lag order was chosen for the co-integration analysis and co- integration analysis discovered one co-integrating vector in the analyzed relationship, thereby verifying and demonstrating the long run relationship between the processor price and farm-gate price of cow milk I. class during the analyzed period. As shown in *Table 3* the trace statistics rejects the null hypothesis of no co-integration among the variables and does not reject the null hypothesis that there is one co-integration relation between variables. The final number of co-integrated vectors with one is equal to one; therefore the estimation of VECM model will be applied in order to find out the long-run relationship. In case of FPQ and PP of semi-fat milk, Johansen test confirmed the existence of long-run relationship in test with unrestricted constant *(Table 4).*

Table 3: Johansen co-integration test (FPI and PP of semi-fat milk)

Hypoth-esized No. of CEs	Eigen-value	Trace test	p-value	Lmax test	p-value
0	0,15347	17,304	0,0247	15,828	0,0260
1	**0,015417**	**1,4760**	**0,2244**	**1,4760**	**0,2244**

Source: own calculations; trace test indicates 1 co-integrating equations at 5% level.

Table 4: Johansen co-integration test (FPQ and PP of semi-fat milk)

Hypoth-esized No. of CEs	Eigen-value	Trace test	p-value	Lmax test	p-value
0	0,17392	18,244	0,0172	15,314	0,0220
1	**0,023287**	**2,0028**	**0,1570**	**4,9639**	**0,1570**

Source: own calculations; trace test indicates 1 co-integrating equations at 5% level.

Based on Engle-Granger test, the model that contains constant was selected and test down for maximum lag order was chosen testing FPI and PP *(Figure 3).* However, it failed to reject the null hypothesis (the Engle-Granger test is often thought by econometricians to have low power and it means that is sometimes fails to reject the null hypothesis even though it is false). Concerning the ADF test on residuals, the unit root null hypothesis is not rejected at 5 per cent significant level, as well as not rejected for the individual variables in case of FPI and PP. The conclusion is that there is no evidence for a co-integrating relationship. On the other hand, Engle-Granger test without constant confirmed the evidence for a co-integration relationship in case of FPQ and PP *(Figure 4).*

Dickey-Fuller test on residuals
p-value **0,4807**
There is evidence for a cointegrating relationship if:
(a) The unit-root hypothesis is not rejected for the individual variables.
(b) The unit-root hypothesis is rejected for the residuals (uhat) from the co-integrating regression.

Figure 3. Engle-Granger test of FPI and PP
Source: own calculations

Dickey-Fuller test on residuals
p-value **0,03001**
There is evidence for a cointegrating relationship if:
(a) The unit-root hypothesis is not rejected for the individual variables.
(b) The unit-root hypothesis is rejected for the residuals (uhat) from the co-integrating regression.

Figure 4. Engle-Granger test of FPQ and PP
Source: own calculations

Based on Johansen test shown in *Table 5,* variables PP and CP are co-integrated regarding to case of cow milk price. Co-integration analysis discovered one co-integrating vector in the analyzed relationship, thereby verifying and demonstrating the long run relationship between the processor price and consumer price of cow milk during the analyzed period. Regarding to Engle-Granger test *(Figure 5),* the model that contains constant and quadratic trend was selected and a test down for maximum lag order was chosen due to the fact that only this way specified model confirmed co-integration. The model with different attributes failed to reject the null hypothesis. Concerning the ADF test on residuals, the unit root null hypothesis is rejected at 5 per cent significant level whereas not rejected for the individual variables. The conclusion is that there is an evidence for a co-integrating relationship.

Table 5. Johansen co-integration test (PP and CP of semi-fat milk)

Hypoth-esized No. of CEs	Eigen-value	Trace test	p-value	Lmax test	p-value
0	0,18070	16,790	0,0300	16,742	0,0179
1	**0,0005724**	**0,048096**	**0,8264**	**0,048096**	**0,8264**

Source: own calculations; trace test indicates 1 co-integrating equations at 5% levels.

As shown in *Table 6,* casual relationship was found between processor price of semi-fat milk and producer price of row cow milk I. class and Q class. There is a bi-directional causal relationship between farm-gate and processor prices. On the other hand, there is an evidence of causal relationship between processor and consumer prices of semi-fat milk. As expected, the processor price does not Granger cause consumer prices of semi-fat milk.

Dickey-Fuller test on residuals
p-value **0,03015**
There is evidence for a cointegrating relationship if:
(a) The unit-root hypothesis is not rejected for the individual variables.
(b) The unit-root hypothesis is rejected for the residuals (uhat) from the cointegrating regression.

Figure 5. Engle-Granger test (PP and CP of semi-fat milk)
Source: own calculations

Table 6. Granger causality (PP and CP of semi-fat milk)

	No. of lags	F- test	p-value	H0
FPQ → PP*	2	5,4687	0,0058	Reject (causality)
PP* → FPQ	2	7,3806	0,0011	Reject (causality)
FPI → PP*	2	12,026	0,0000	Reject (causality)
PP* → FPI	2	4,0598	0,0205	Reject (causality)
PP* → CP*	2	2,7041	0,0724	Do not reject
CP* → PP*	2	9,3989	0,0002	Reject (causality)

Source: own calculations; FPQ/farm-gate price of raw cow milk Q class; FPI/farm-gate price of raw cow milk I. class; PP*/processor price of semi-fat milk; CP*/consumer price of semi-fat milk

The VAR model was computed in order to find out the optimal lag according to Akaike information criterion (AIC), Schwarz-Bayesian criterion (SBC) and Hannan and Quinn information criterion (HQ). On the basis of optimal lag order according to the VAR model which was set to two by SBC and HQC, VECM consists of 2 lag order, two endogenous variables (l_producer, l_processor) and constant was not included while testing farm-gate price of raw cow milk I. class and processor price of semi-fat milk. According to *Figure 6 and 7,* VECM form with unrestricted constant and two endogenous variables (l-producer, l-processor) was used in both cases and endogenous variables are transformed variables into natural log form. The Beta transported vector shows the nature of the long term relationship between FP and PP. Co-integration vector expressing the long-term relation has a following form in case of FPI and PP: (1,0000; –1,4852). The value of 1,4852 expresses price transmission elasticity. The value is higher than 1 and therefore an imperfect market structure is considered; more specifically oligopoly or oligopsony power is presented meaning that the market power is on the demand side according to Lloyd et al. (2004); this means that processors have a stronger power than producers. The price elasticity says that increase in PP price by 1,00 per cent results in rise of FPI by 1,49 per cent. Concerning FPQ and PP, co-integration vector has a following form: (1.0000; –0,87426). The value is lower than 1 but also indicates imperfect market structure and the price elasticity says that rise in PP price by 1,00 per cent results in rise of FPQ by 0,87 per cent. The results also show that the processor and farm-gate price margin is going up in the long run. Alfa parameters show how fast each variable reaches equilibrium- the higher the value the faster the reaction. The Alfa parameter is significant only in case of processor price. Therefore the relationship

between FPI and PP is not simultaneous and FPI is considered to be weakly exogenous. However, adjustment coefficients do not have the expected sign. On the other hand, the alfa parameter is significant just in case farm-gate price of raw cow milk Q class, meaning that the relationship between FPQ and PP is not simultaneous as well, moreover the coefficient of FPQ has the expected sign and processor price is weakly exogenous variable.

DW statistics confirmed that unnecessary lags were included in both models and the models are efficient and does not include autocorrelation according to Breusch-Godfrey test too. Null hypothesis (homoscedasticity) is not rejected while testing ARCH test. On the other hand, the null hypothesis in case of the test for normality of residual was rejected; however, this might be due to the fact that all variables were transformed by taking a natural logarithm *(Figure 6, Figure 7).*

According to Figure 8, VECM form with unrestricted constant and two endogenous variables (l-processor, l-producer) was used and the optimal lag order was selected according to the VAR model which was set to two by AIC, HQC and BIC. Co-integration vector expressing the long-term relation has a following form: (1,0000; –1,3099). The Beta transported shows the nature of the market structure. The value is higher than 1, therefore an imperfect market structure is considered; more specifically, oligopoly and oligopsony power can be found in the market according to Lloyd et al. (2004). The price elasticity says that increase in consumer price by 1,00 per cent results in increase of processor price by 1,3099 per cent. Alfa parameters show that the speed of adjustment is not significant in both cases and confirmed that the relationship between processor and consumer price is not simultaneous.

DW statistics confirmed that unnecessary lags were included in the model. The model is efficient and does not include autocorrelation according to Breusch-Godfrey test too. Null hypothesis (homoscedasticity) is not rejected while testing ARCH test. On the other hand, the null hypothesis in case of the test for normality of residual was rejected; however, this might be due to the fact that all variables were transformed by taking a natural logarithm. In addition, the specification for the model can be considered appropriate. The results are shown in *Figure 8.*

Testing for symmetry or asymmetry in price transmission was done by dummy variable technique in VECM. The dummy variable that allows for positive and negative disequilibria is different from zero. The results indicate that PP reacts differently to changes in CP in case of examined long-run relationships and vice versa. However, the presence of symmetry was revealed while testing the adjustment from PP of semi-fat milk to FPQ. On the other hand, PP of semi-fat milk reacts again differently to changes in FPQ *(Table 7).*

VECM system, lag order 2 Maximum likelihood estimates, observations 2004:03-2011:12 (T = 94)	
beta (cointegrating vectors, standard errors in parentheses) l_Producer 1,0000 (0,00000) l_Processor –1,4852 (0,032526) alpha (adjustment vectors) l_Producer 0,044414 (p-value 0,29075) l_Processor 0,10580 (p-value 0,01083)	Test for ARCH: Equation1 p-value= 0,276457 Equation2 p-value= 0,207209 Test for Autocorrelation Breusch Godfrey Equation1 p-value= 0,273 Equation2 p-value= 0,589 Test for Normality test p-value= 2,18145e-006

Figure 6: VECM (FPI and PP of semi-fat milk)
Source: own calculations

VECM system, lag order 2 Maximum likelihood estimates, observations 2004:03–2011:12 (T = 94)	
beta (cointegrating vectors, standard errors in parentheses) l_Producer 1,0000 (0,00000) l_Processor –0,87426 (0,16823) alpha (adjustment vectors) l_Producer -0,097670 (p-value 0,03064) l_Processor 0,068182 (p-value 0,26309)	Test for ARCH: Equation1 p-value= 0,064831 Equation2 p-value= 0,683741 Test for Autocorrelation Breusch Godfrey Equation1 p-value= 0,461 Equation2 p-value= 0,915 Test for Normality test p-value= 3,90681e-012

Figure 7: VECM (FPQ and PP of semi-fat milk)
Source: own calculations

VECM system, lag order 2 Maximum likelihood estimates, observations 2004:03–2011:12 (T = 94)	
beta (cointegrating vectors, standard errors in parentheses) l_Processor 1,0000 (0,00000) l_Consumer –1,3099 (0,25779) alpha (adjustment vectors) l_Processor -0,079311 (p-value 0,18314) l_Consumer 0,056511 (p-value 0,07793)	Test for ARCH: Equation1 p-value= 0,153102 Equation2 p-value= 0,218273 Test for Autocorrelation Breusch Godfrey Equation1 p-value= 0,673 Equation2 p-value= 0,934 Test for Normality test p-value= 7,80601e-005

Figure 8: VECM (PP and CP of semi-fat milk in PE bags)
Source: own calculations

Table 7. Dummy variables

Dummy variables (FPQ and PP semi-fat milk)				
Variable	Coefficient	Std. Error	t-statistic	p-value
D	0,000133816	0,0129162	0,0104	0,99176
Variable	Coefficient	Std. Error	t-statistic	p-value
D	0,0593341	0,0158135	3,7521	0,00034
Dummy variables (PP and CP of pasteurized semi-fat milk)				
Variable	Coefficient	Std. Error	t-statistic	p-value
D	0,0514616	0,0149727	3,4370	0,00095
Variable	Coefficient	Std. Error	t-statistic	p-value
D	0,0159552	0,00869682	1,8346	0,07038
Dummy variable (FPI-PP of semi-fat milk)				
Variable	Coefficient	Std. Error	t-statistic	p-value
D	-0,0262489	0,0153145	-1,7140	0,09045
Variable	Coefficient	Std. Error	t-statistic	p-value
D	0,0263494	0,0144162	1,8278	0,07136

Source: own calculations

Conclusion

Firstly, the main features and desriptive statistics of the selected time series were examined. The Johansen co-integration test and Engle-Granger test were conducted in order to clarify the long-term co-integration. The results provided an evidence of co-integration relationship between the raw cow milk prices and processor prices of semi-fat milk as well as between processor prices of milk and consumer prices of milk. However, the simultaneous relationship between prise series was not confirmed in any case. The Granger causality tests suggest that there is bilateral causality in almost all examined cases, however, PP of semi-fat milk does not (Granger) caused CP. Based on the results of VECM, FPI is exogenous while observing its relationship with processor price, meaning that the processor prices are influenced by FPI in the long-run. On the other hand, it can be stated that producers of raw cow milk in quality class Q are price takers. An explanation behind this is a share of FPQ on the total purchase of raw cow milk that increases in case of supply scarcity and diminishes due to market surplus of raw cow milk. Additionally, retail prices have an impact on processor prices in the long-term. The analysis also detected the imperfect market structure and confirmed the fact that was expected: market power is on the demand side. Asymmetric price transmission was found to be evident in the chain. However, the adjustment from PP of semi-fat milk to FPQ revealed symmetry in price transmission.

The empirical analysis confirmed the inefficient market functioning characterized by the dominant position of retailers. Moreover, we can conclude that market environment is being deformed and retailers are able to abuse their market power in the vertical dairy chain. The mark-up pricing model is in direction from retailers-to-processors-to-producers, meaning that the retailers have the major impact on price determination in the dairy chain. This is very common since they are also able to place imported dairy goods at competitive prices on the market. These market circumstances trigger the wrong functioning and poor distribution of margins in the Slovak dairy sector. Producers are very fragmented, their willingness to cooperate together is weak and their impact on price decisions is low which also rise from the fact that milk is a perishable commodity. Due to the evidence of market failure we recommends closer cooperation of producers by establishing associations that might help them to achieve better position and strengthen their negotiation power in vertical linkages. Regarding to processors, there is also a scope for mutual cooperation based on establishment of their own retail networks.

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BRANDING POTENTIAL OF SPAS IN THE NORTHERN PLAIN AND THE MID-TRANSDANUBIAN REGIONS

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Abstract: Based on both primary and secondary research in our article we examined the brand elements of the main baths of the Northern-Plain Region (Szolnok Liget Thermal and Experience Bath, Nyiregyháza Aquarius Experience Bath, a Hajdúszoboszló Hungarospa Plc. and the Debrecen Aquaticum Mediterranean Experience bath) and the Mid-Transdanubian Region (Komárom Medical bath, Agárd Thermal and Medical Bath, Pápa Castle Garden Bath) and worked out their brand systems. We also examined and analysed the possibilities and process of branding. According to their brand elements we established three categories for the baths: Established brands, Developing brands and Brandable baths.

Keywords: branding, brand element, tourism brand, bath

Introduction

One of the most important tourism products of Hungary is its health tourism. The Northern Plain and Mid-Transdanubian Regions are rich in thermal baths and spas, and can boast some really well-known and popular ones both in domestic and international markets. Spas are often favoured destinations of summer holidays and free time programs as they offer opportunities for regular keep-fit activities, body care, relaxation as well as medical treatment provided by professional staff. They have become regular places for the up-keeping of general wellbeing, physical and mental health, they are no longer just venues of few-week summer holidays. Regular spa customers far from their homes today expect to have access to quality free time activities, something that spas of different destinations have increasingly to take into account during the process of tourism product development.

In tourism today there is an increasing demand for high quality services. In the future the product and brand development of European destinations will have to be based on high quality services and innovation. The health tourism strategy developed by ESKI (National Health Strategy Research Institute) underlines the fact that Hungarian thermal water is not a strong enough call phrase on international markets, thermal water as a sole attraction does not guarantee a competitive position any more. Infrastructurally spas need to be upgraded to level of wellness and experience baths, the 'blue-pool' aspect has to be strengthened and there have to be more targeted medical services provided by professional staff. Health tourism products have to be transformed from the price advantage category to the quality/gap-filling niche product category. (ESKI, 2010)

In order for tourism products to be competitive today they need to possess a distinct character they have to appear as a brand. Today it is not only the Mediterranean sandy beaches and exotic destinations that are attractive to tourists, but also there is a growing demand for destinations that are unique and have something special to offer.

Background of the research

Baths offer a wide choice of free time activities to their guests who are in search of colourful experiences. In the US most people visit baths out of 4 different motivations: stress-relief, self-indulgence, improvement of health and 'cutting loose'. Women aged under 40 go for the pampering programs, women over 50 prefer medical treatment, men look for sauna, massage, gym and other sports services. *(Patrícia A. Monteson-Judith Singer 2004).*

The destination of the future is characterized by a unique image. (Bodnár, 2008). Spa research carried out about the baths of Karcag and Cserekeszőlő (*Müller et al. 2005)* proved that baths' uniqueness and image could be strengthened by product diversification and subsequently they can be made well-known for target markets by proper positioning. The importance of a distinct character is emphasized by Gyarmati (2005) in the case of baths in Eger, Egerszalók, Miskolctapolca. In order to win target markets they have to even be able to characterize a distinct lifestyle.

A tourism destination brand can be a town, a region or even a whole country. Simon Anholt , who first used the expression Nation Brand in the late 90s, in his keynote speech at the conference of EuroPCom in the European Parliament stressed that a strong destination brand is only possible if people developing it and living in it are well aware of who they are and how they are different from the rest of the world, what is the value added they can share with others. Also, they stressed that brand developers and brands need to be able to give valid responses to global challenges at local level. (Anholt, 2011)

It will not take more than a few hours' research on the internet to discover that the biggest challenge of our era is sustainable development both from an environmental, economic and social point of view. It applies to all industries. Stefan Gössling, in his lecture held at Queensland University, highlights that the forecasted growth rate of the tourism industry is possible only at BEU (Business As Usual), something that will be impossible to keep for many reasons. (Gössling, 2011)

On the UNWTO website the MDG (Milennium Development Goals) section starts by three keywords: Sustainable, Competitive, Responsible. On the website of WTTC the 'Our mission' section also underlines the importance of sustainability. (wttc, 2012). In its draft of Tourism Development Strategy circulated for discussion the NGM (National Ministry of Economy) expresses this in the following way: "Competition is getting more and more fierce between destinations both for tourism products and the applied marketing techniques. In a market crammed with messages there is a need for authentic, ethical and sustainable destination brands. " (NGM, 2011)

Because of competition between destinations and the ever-changing nature of tourists' expectations and behaviour tourism destinations need to be managed as other commercial brands. The brand image plays a crucial role in the success of destinations and has a significant influence on customer behaviour. Tourists visiting a destination for the first time are more likely to choose one which has a powerful, positive, unique, easily recognizable image. *(*Asunción Beerli, Josefa D. Martín 2004*)* Thus, brand and a unique image significantly influence destination choice.

A brand is a "Name, term, design, symbol, or any other feature that identifies one seller's good or service as distinct from those of other sellers." (Kotler, 1999) Today it is very important that Hungary should be able to create, based on our special characteristics, a strong brand which makes us distinct from all our competitors on the increasingly competitive global tourism market.

An alternative definition: products or services which offer a useful and unique set of features in a standardized form and the same quality. (KAMINSKY, 1999: 152, in: Horkay, 2003). This definition puts the customer, the fulfillment of the customer's needs and the quality parameters of the products and services.

Brand policy communicates recognizable achievements which are unique to the company and can be recognized from time to time again. (Bruhn, 1944). A good example for brand policy is the successful hotel chains (Danubius, Hilton, stb.) which emphasize easily recognizable company specific features in their marketing.

In many cases the customers do not simply buy a product, they buy a brand. Customers and guests attach an expected quality to the brand, consequently brands delivering the biggest customer satisfaction will be the most successful on the market. Purchasing decisions are not always made in favour of the provider offering the highest quality services, the price-service ratio can be a more significant factor. (Scherlag, 2000)

As any other brand, destination brands aim to form a distinctive image that is recognizable and can be differentiated from rival destinations. (Horkay 2003)

In the domestic and international competition of destinations only those regions and places are successful which focus on the experiences of the most successful international destinations (benchmarking) and combine their innovative, quality-centred tourism product development with consistent positioning and differentiating strategy. Professional brand policy in tourism (brand creation and management) is the competitive means to creating a unique product portfolio. It is a break-out point and a strategic task for the management of every destination: lasting success is guaranteed only by possessing a brand which cannot be confused or replaced by other brands, a brand that has an appeal, invokes emotions and has a strong enough reputation. (Horkay, 2003)

Aim of the research

The aim of the research was to determine the branding potential, brand position and future brand building tasks of baths in Hungary.

Hypothesis:

By examining brand elements of baths their branding potential can be determined for the specific region and the main directions of brand development can also be specified.

Material and methods

A survey conducted in the baths of the Northern Plain Region (Szolnok Liget Thermal and Experience Bath, Nyiregyháza Aquarius Experience Bath, a Hajdúszoboszló Hungarospa Plc. and the Debrecen Aquaticum Mediterranean Experience bath) in 2008 (n=457) served as the secondary database for the research. Primary data collection was carried out in the baths of the Mid-Transdanubian Region (Kerényi-Müller-Szabó-Mosonyi 2010) with the participation of guests of three baths. (Komárom Medical bath, Agárd Thermal and Medical Bath, Pápa Castle Garden Bath, n=375)

In the questionnaires used in the baths there were both open and closed questions.

Part of the questions were put into the question group concerning quality assessment of the baths. Guest satisfaction was measured through the provided services, the work of the staff, etc. There were questions about how satisfied they

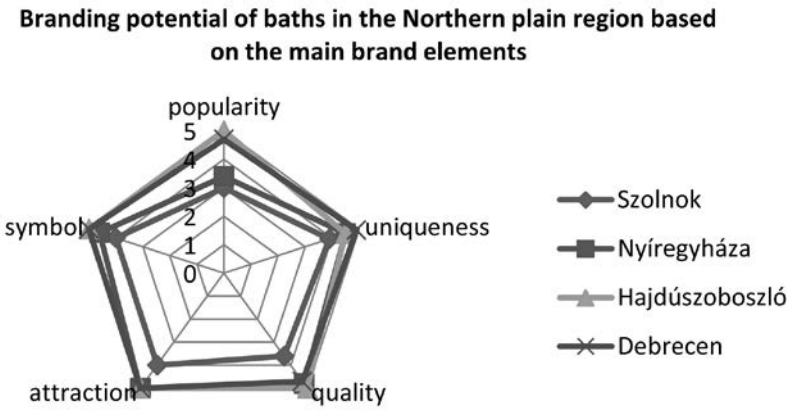
were with the opening hours, the work of staff, the price/value ratio of services, the choice of services, the quality of services including cleanliness of pools and their design elements. Answers to these questions were scaled between 1–5. 1=not satisfied at all, 2=not very satisfied, 3=fairly satisfied, 4=satisfied, 5=very satisfied.

An average was calculated from the results showing the overall assessment of baths by the guests.

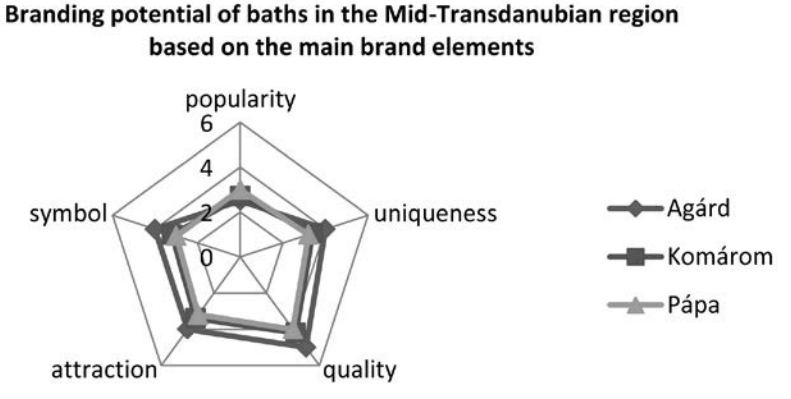
The main question groups as referred to above:

- questions about guests' familiarity with information such as prices, services, marketing activity, water composition etc
- questions about factors affecting bath choice such as number of pools, design of bath, etc.
- questions about the symbols and associations concerning the bath such as thoughts and feelings induced by the bath and the time spent there, experiences with the water, experiences with the slides etc.

Questions were rated by guests on a 1–5 scale and the average values of the different brand elements were displayed on graphs. Data was processed with SPSS 18.0 statistical software.



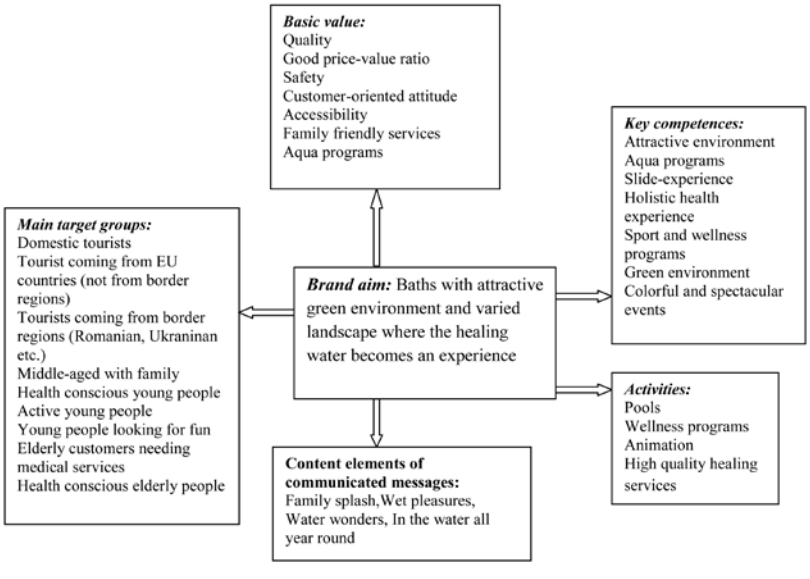
Graph 1.: Brand system of the baths in the Northern Plain Region



Graph 2.: Brand system of baths in the Mid-Transdanubian Region

Results

In the questionnaires there were questions about the reputation of the bath and the connection between reputation and the travel decision. Questions about customer satisfaction were focused on: choice of products, prices, cleanliness of the bath and its environment, design elements of pools, hospitality of local people, opening hours, quality of service provided by staff, prices of tickets and the price-value ratio, programs offered by the bath and children friendly services. An average was calculated from the data to show quality. Other questions were aimed at symbols of the bath and its attraction elements. Several unique features of the baths were specified by the participants. The results are graphically presented in *Graphs 1. and 2.*



Graph 3: Umbrella brand of the experience baths of Hungary

Examination of brand elements clearly shows that the baths of Debrecen and Hajdúszoboszló have a well-established brand.

The baths of Agárd and Nyíregyháza have a developing brand.

Although the baths of Szolnok, Komárom and Pápa possess some distinct and recognizable brand elements their brands are considerably weaker taking all elements into account. Their popularity could be improved by strengthening their uniqueness.

Although it is important that baths should represent unique (sub) brands, the baths of the country have to be gathered under

one big umbrella brand. As one of the leading health tourism destinations in Europe, Hungary's baths have to appear as a well-recognizable umbrella brand as a result of branding. Health tourism destinations can be transformed into brands through product development and an emphasis on USPs and also by using proper re-positioning. The evolving brands can improve customer loyalty.

The umbrella brand contains the brand aims, basic values, activities, key competencies, communicated messages and main target groups to which all domestic baths have to conform when developing their individual brands.

Conclusion

Out of the baths of the Northern Plain region the Hajdúszoboszlói Hungarospa Plc and the Debrecen Aquaticum Mediterranean Experience bath has a stronger brand than the Szolnok Liget Thermal and Experience Bath and the Nyiregyháza Aquarius Experience Bath in all brand element categories. These results are partly explained by the fact that the bath in Hajdúszoboszló is in the maturity phase of its product lifecycle as it has been positioning itself on the domestic market since the 1960s. Although the bath in Debrecen started its operation later on the health tourism market, the attractions of the town and its tourism potential has greatly contributed to its success. Both of the baths have gone through significant attraction development which had a considerable impact on the strengthening of their quality, uniqueness, symbol system. These baths are well-known and respected service providers not only on the domestic but the international markets as well. They could be labelled as market leading rivals in the Northern Plain region.

The baths in Szolnok and Nyíregyháza draw customers mainly from the domestic market as they are lesser-known and lack a really wide choice of attractions. In terms of product life cycle they are in the growth phase. Strengthening of their brands can be through enriching their USPs, widening their choice of services and making their marketing communication strategy more effective. They are upcoming competitors of the baths of Debrecen and Hajdúszoboszló in the region.

The baths of the Mid-Transdanubian Region (Komárom Medical bath, Agárd Thermal and Medical Bath, Pápa Castle Garden Bath) have a significantly weaker brand potential than the baths of the Northern Plain region. They have not been on the market for long serving mainly local and micro regional demands. Attraction development, innovation into unique services can be an effective way to improve their brand potential and make themselves better-known on the market.

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ENVIRONMENTAL CORPORATE SOCIAL RESPONSIBILITY (ECSR) IN POLISH FOOD SECTOR ENTERPRISES FROM CZĘSTOCHOWA REGION – EMPIRICAL ANALYSIS

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Abstract: The purpose of the paper is the assessment of implementation of Environmental Corporate Social Responsibility (ECSR) concept in Polish food industry in Czestochowa region. ECSR is an important part of the concept of corporate social responsibility (CSR). The food industry has many impacts on the environment and strongly depends on natural resources, that is why companies' environmental consequences of their functioning are important part of corporate management.
The most popular activities in the area of the CSR in Polish enterprises relate to the environmental protection. The analysis of the research results indicates, that 38% of the surveyed enterprises follow the ECSR rules, including mostly large manufacturing enterprises. The ECSR is seen as a tool for creating positive image and reputation of a company on the market and for enhancing the organizational culture of an enterprise. Unfortunately, surveyed enterprises have not perceived the ECSR concept as a tool for creating a competitive advantage on the market yet.

Keywords: ECSR, enterprise, food sector, environment, responsibility

Introduction

All sectors of the economy are affected by the increasing societal demand with respect to CSR. However, given the characteristics of the industry, the pressure exerted on companies to take up CSR likely differs, for example with the sectors' economic, social and economic impact. While there are sectors such as mining that have a stronger impact on the environment there is likely no other sector that is as highly dependent on natural resources as the food sector while at the same time having considerable and diverse impacts on the environment (Hartmann 2011). Polish food industry enterprises with the specificity of individual sectors represent a source of a number of threats to all the components of the natural environment in: soil and water, air, plants, animals and humans.

Environmental protection in the food industry should encompass almost all its resources. Rational water and wastewater management, waste management (with particular focus on the organic waste), air and soil protection from pollutants and noise protection should be a priority in implementation of the strategies that limit the negative effect of the enterprises in the food industry on the environment.

Civil society and media increasingly request companies to consider the social and environmental consequences of their activities and to provide more transparency and openness with respect to their action (Freeman et al., 2010). Thus, it is not surprising that CSR has developed to one of the top priorities of businesses over the last decade. In the context of CSR the food sector faces specific challenges. That is why Polish food companies can be more responsible and transparent via implementation of the Environmental Corporate Social Responsibility (ECSR) concept.

Terminology of the ECSR concept

Environmental corporate social responsibility (ECSR) is an important and distinct part of the overarching concept of corporate social responsibility (CSR). Strategies related to environmental aspects mainly concern the reduction and recycling of resources. The environmental dimension of CSR engagement is concerned with the following environmental indicators that could be approached separately or combined. Strategies on *biodiversity* are on the protection of the regional environment and support for biodiverse areas. *Emission* is on the reduction of greenhouse gas emissions within the

production process. The dimension *energy and water* concerns the reduction of energy demand of the company. *Resource consumption/material efficiency* is approaching the recycling and re-usage of material within the production processes. This is related to *waste disposal* that is concerning correct separation of waste for recycling.

High levels of CSR do not necessarily equate to high levels of ECSR. ECSR is a multidimensional concept (Rahman and Post 2012). According to Mazurkiewicz ECSR is ''the duty to cover the environmental implications of the company's operations, products and facilities; eliminate waste and emissions; maximize the efficiency and productivity of its resources; and minimize practices that might adversely affect the enjoyment of the country's resources by future generations'' (Mazurkiewicz 2004). Others have defined ECSR as environmentally friendly actions that go beyond the compliance of legal requirements by privately providing for public goods or internalizing negative externalities (Lyon and Maxwell 2008; Portney 2008). ECSR is a concept of companies voluntarily integrating environmental concerns in their business operations and in their interaction with their stakeholders. It is viewed as the contribution that firms make to sustainable development by balancing and improving environmental impacts without damaging economic performance (Lyon and Maxwell 2008). Corporate ecological responsiveness is a set of corporate initiatives aimed at mitigating a firm's impact on the natural environment. These initiatives can include changes to the firm's products, processes, and policies, such as reducing energy consumption and waste generation, using ecologically sustainable resources, and implementing an environmental management system. The concept of corporate ecological responsiveness refers not to what a firm should do, but to the initiatives that reduce the firm's 'ecological footprint' (Bansal and Roth 2000). Broadly, ECSR focuses on firm-specific activities, both compliant and preventative, that limit the adverse environmental impact of these firms.

Benefits of the implementation of the ECSR instrument in enterprises

Organizations operating in accordance with the environmental corporate responsibility can benefit in multiple ways both external related to the company's environment and internal representing the relations within the company itself. Another approach to classifying benefits of the ECSR implementation is to divide them into general business, operational and financial.

The first group of general business benefits include mainly the improvement of company's reputation and enhancing the brand capital through environmentally-friendly behaviour. The brand capital and brand value must be created by all interested parties satisfied with their expectations, and not only by customers (Chi-Shiun Lai et. al., 2010). Environmental corporate responsibility can contribute to the establishment of new businesses and to the improvement of relations with interested parties, especially with local communities. Enterprises' engagement and its commitment to solve environmental problems make obtaining the local communities favour easier, help to win local authorities' trust, and to reduce the frequency of interventions by regulators.

The second group of the operational benefits resulting from following the ECSR idea include: quality improvement and innovation increase (including eco-innovation), increase of loyalty not only of employees but also customers and contractors. Higher environmental quality of products accompanied by affordable price for consumers can contribute to the increase of sales to aware customers and interested parties. The implementation of environmental good practices often leads to a reduction of environmental risks related to possible environmental threats.

Lowering the consumption of natural resources, reducing the emission and waste generation lead to the increase of company's eco-efficiency and value (Al Najjar and Anfimiadou 2012). Improving an enterprises' eco-efficiency helps to lower the costs and gain a competitive advantage, and is certainly one of the most emphasized financial benefits for the enterprise (Wagner 2009). The survey of the largest companies indicates that the strongest engagement in the CSR area relates to the environmental protection (Menedżerowie 500).

The positive effect of the ECSR can also be assessed not only from the point of view of financial performance but also non-financial performance, which are related to the creation of the image and reputation of an organization, to the increase of employee motivation, and to the improvement of brand image mentioned before (Chodyński 2011). Enterprises that demonstrate environmental proactivity in the area of environmental corporate responsibility benefit through the increased sales to customers who appreciate environmentally-friendly attitudes and behaviour, thus increasing their revenues.

Materials and methods

The research was conducted in years 2011-2012 on a sample of 33 enterprises representing small (16%), medium-sized (29%), and large (55%) enterprises from food industry in Częstochowa region[1]. Covered by the research were the enterprises from following sectors: services (5%), trade (20%), manufacturing (38%), and multisectoral (37%). As far as industry was concerned the sample was dominated by dairy, fruit and vegetable, bakery and meat enterprises. The questionnaire was filled by entrepreneurs[2] or managers. The random selection was used. Surveyed subjects were enterprises of worldwide (20%), European (48%), and national (32%) range. The financial standing of surveyed enterprises in the sample was as follows: very good (16%), good (43%), average (33%), and poor (8%). Gathered statistical data were

[1] In Częstochowa region there are 49,713 registered enterprises (as of 31.12.2011), including 48,371 privately owned enterprises.

[2] In small and medium-sized companies.

processed with STATISTICA 9.1 software both in terms of quantity and quality with the use of descriptive statistics and Spearman's rank correlation coefficient.

The first question was whether the respondents in their activity take into account the Environmental Corporate Social Responsibility idea. The group of enterprises that follow the ECSR rules was asked to indicate the activities that they implement in the ECSR area (Figure 1). Then the respondents were asked to comment on two sets of statements related to the external and internal benefits that can be obtained by enterprises that follow the ECSR idea (those statements are presented in *Tables 1 and 2*). Respondents answered the questions with the replies prepared on the 5-point Likert scale.

Results and discussion

The quantitative analysis indicates that 38% enterprises of the sample follow the ECSR rules, of which 28.6% of surveyed were large manufacturing enterprises. This group included companies of good or very good financial standing and operating in the worldwide range. 9% of surveyed enterprises do not follow any ECSR rules in their business activity. Other enterprises answered the question with "rather yes" (50%), "rather no" and "do not know" (7.14%). Total of 14.3% of surveyed enterprises are not decided in the matter of the ECSR implementation in their organizations.

Further in the survey the respondents were asked to choose presented activities in the area of CSR related to the environment. In the environment area, companies perceive the CSR mainly as the reduction of waste generation, recycling, disposal and segregation of waste (48% of responses). The second activity significant for the surveyed in the ECSR area is the sustainable use of natural resources through efficient use of such resources as energy and water (38% of responses). In much lesser degree the surveyed implement activities in the area of the ECSR related to counteracting climate change, biodiversity, and restoration of natural habitats. The distribution of responses is presented in *Figure 1.*

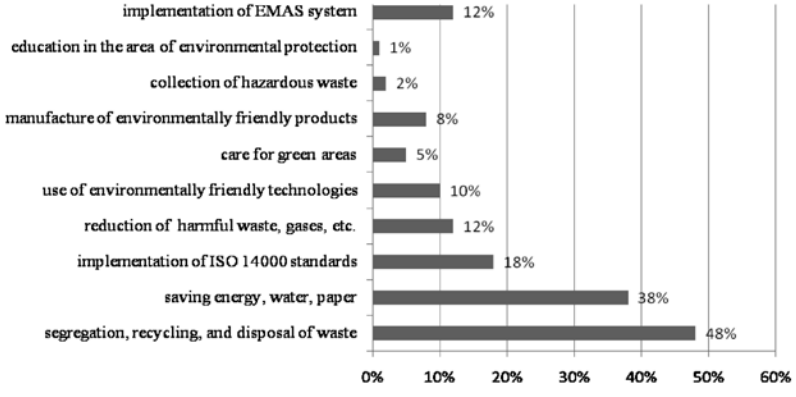

Figure 1: Activities implemented by enterprises in the area of environment within the framework of CSR concept
Responses do not sum up to 100, as the respondents could choose more than one response
Source: Own elaboration based on the research.

The second part of the research employed the qualitative analysis of studied variables, which were the attributes of possible internal benefits obtained by enterprises in result of implementing the procedure rules in accordance with the ECSR concept. The descriptive statistics analysis indicates that increasing the level of organizational culture in a company ($\bar{x}$ –4, 16) is one of the most important internal benefits resulting from the ECSR implementation, in the opinion of surveyed enterprises. Compatibility of the surveyed in the assessment of this variable is high, which is demonstrated by the smallest span of responses and the lowest standard deviation. In the second place the respondents choose the improvement of management quality through the increase of products and services quality ($\bar{x}$ –4,08) and the possibility of a better compliance with legal requirements of the implementation of environmental corporate responsibility ($\bar{x}$ –4,04). Descriptive statistics for the evaluation of internal benefits of the ECSR concept are presented in *Table 1.*

Table 1: Descriptive statistics for internal benefits resulting from the implementation of the ECSR in an enterprise

	$\bar{x}$	Mode	Median	Standard deviation	Min	Max
Increasing the level of organizational culture	4.16	4	4.00	0.66	3	5.00
Increasing sales	2.96	3	3.00	1.10	1	5.00
Decreasing costs	3.12	2	3.00	1.30	1	5.00
Attracting and retaining the best employees	2.80	3	3.00	1.12	1	5.00
Better compliance with legal rules	4.04	4	4.00	0.84	1	5.00
Improving management quality (improving products and services quality)	4.08	4	4.00	0.81	3	5.00

Source: Own elaboration. Where: 1 – definitely no, 2 – rather no, 3 – do not know, 4 – rather yes, 5 – definitely yes.

The comparison of average assessments of external benefits of the ECSR implementation clearly indicate that the improvement of company's image and reputation on the market is the most important of them ($\bar{x}$ –4,51). Respondents also recognize the possibilities to make better contacts with local communities (($\bar{x}$ –3,75), however they are not consistent in that assessment (the highest standard deviation and the span of responses). Descriptive statistics for external benefits of the ECSR are presented in *Table 2.*

To assess the correlation relationship between the variables representing the internal and external benefits the Spearman rank correlation matrix was developed, and its results of statistically significant coefficients are presented in *Table 3.*

Table 2: Descriptive statistics for external benefits resulting from the implementation of the ECSR in an enterprise

	$\bar{x}$	Mode	Median	Standard deviation	Min	Max
Improving company's image and reputation	4.51	5	5.00	0.714	3	5
Increasing the loyalty of customers	3.38	4	3.50	0.924	1	5
Increasing the chance for a company's long-term success	3.40	4	3.00	1.080	1	5
Good contacts with the media	3.04	4	3.00	0.955	1	4
Better conditions for the business	3.00	3	3.00	0.957	1	5
Better contacts with local communities (interested parties)	3.75	4	4.00	1.113	1	5

Source: Own elaboration. Where: 1 – definitely no, 2 – rather no, 3 – do not know, 4 – rather yes, 5 – definitely yes.

The correlation matrix shows that attracting and retaining the best employees with high competence is closely related to the increase of sales in a company (variables "attracting and retaining the best employees" vs. "increasing sales" (R – 0.63 with p<0.001). Better compliance with legal rules in enterprises is positively correlated with improving company's image and reputation (R – 0.45 with p<0.05) and with company's long-term success on the market (R – 0.5 with p<0.05). Developing good relations with local communities has a positive effect on the improvement of company's image and reputation (R – 0.47 with p<0.05), on the company's long-term success (R – 0.46 with p<0.05), and also on the good contacts with the media (R – 0.43 with p<0.05).

The results of the correlation matrix give the conclusion that the continuous improvement of management quality in the enterprise contributes to increased customer loyalty (R – 0.46 with p<0.05) and has a positively effect on a better adaption to the legal requirements (R – 0.46 with p<0.05). Improving the company's image and reputation has a positive effect on increasing customer loyalty (R – 0.46 with p<0.05).

In summary, respondents rate higher external benefits resulting from the implementation of the ECSR, regardless of the type and range of the company's business. Only companies with average financial condition and medium size assessed internal benefits from the implementation of ECSR higher.

Facing the challenges of environmental corporate responsibility helps to raise the standards of dealing with internal interested parties, which result in increased environmental culture of the company and employees better understand the rules of environmental responsibility.

Environmental programs implemented under the ECSR help to protect the natural environment and contribute to the improvement of its condition and to the pollution level reduction. The research results confirm that the most powerful motivator for activities of environmental and social responsibility is the improvement of reputation, trust and strengthening of brand capital (Marcinkowska 2010, Mishra and Suar 2010). Companies in the region also perceive the role of the media in creating a positive image and the impact of local community pressure on environmental issues. Unfortunately Polish food industry companies in the region do not treat the ECSR as a tool to improve the competitive position, despite the fact that more and more companies achieve competitive advantage and economic benefits operating in accordance with the principles of environmental responsibility (Hart and Ahuja 1997). Similarly, ecologically friendly products, processes and management systems generate benefits by increasing revenues and reducing costs. It can be observed that customers are interested in companies that demonstrate environmental proactivity (Mishra and Suar 2010). Most of the surveyed

Table 3. Internal and external benefits resulting from the implementation of the ECSR – Spearman rank correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12
Increasing the level of organizational culture	1											
Increasing sales	–0.08	1										
Decreasing costs	0.03	0.23	1									
Attracting and retaining the best employees	0.28	0.63***	0.30	1								
Better compliance with legal rules	0.28	0.16	–0.14	0.32	1							
Improving management quality (improving products and services quality)	0.35	0.32	–0.09	0.40*	0.41*	1						
Improving company's image and reputation	–0.06	0.27	–0.33	0.24	0.45*	0.39	1					
Increasing the loyalty of customers	0.08	0.28	–0.08	0.23	0.31	0.46*	0.46*	1				
Increasing the chance for a company's long-term success	0.29	0.13	0.14	0.43*	0.50*	0.27	0.36	0.40	1			
Good contacts with the media	0.01	0.36	0.02	0.26	0.09	0.19	0.41*	0.44*	0.25	1		
Better conditions for the business	0.38	0.12	0.20	0.24	0.17	0.35	0.04	-0.05	0.28	0.43*	1	
Better contacts with local communities (interested parties)	0.05	0.06	–0.24	0.18	0.45*	0.36	0.47*	0.29	0.46*	0.43*	0.34	1

Asterix indicates only the statistically significant correlation results with various significance levels *p<0.05; ***p<0.001.
Source: Own elaboration.

enterprises could not clearly determine whether they followed the ECSR standards, which may indicate a misunderstanding of the concept of the ECSR due to multiple interpretations.

Summary

In the modern economy, dynamically changing environment affects the methods and concepts of corporate management. These changes are also manifested by increasing social and environmental requirements for enterprises, especially those with significant impact on the natural environment. The activities of the food industry enterprises greatly depend on the availability of natural resources. (Environmental) quality of products and services of the food industry companies can determine the success of the market. Implementing the principles of environmental responsibility in accordance with the ECSR concept helps to improve the reputation and image of the enterprise, which may consequently contribute to its long-term success. Therefore the operation of enterprises in the modern economy is of multidimensional nature and the purpose of their activity is no longer only the maximization of profits, but also actions that require a holistic approach to corporate management.

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REPORTING COMPANIES' PERFORMANCE – IN RESPECT OF THE INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS)

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***Abstract*:** The role of information became more important due to rapidly changing technical conditions, market and economic regulations in our globalizing world. Several regulations tend to provide the framework for reporting performance and income of the companies, but in different statements performance is inconsistently presented and many kind of evaluation method exist in the practice. These facts led to the demand of properly assess the financial health of an organization, and created a commonly accepted rule-system, which name was International Financial Reporting Standards (IFRS).
In this paper I tend to present the statements, definitions and factors, which can have great influence in representing the performance, income of the company in the frame of the IFRS, and reveal the differences between the other accounting regulations (EU directives, Hungarian Accounting Act) in this field.

Keywords: reporting, corporate performance, income, comprehensive income, income statement, international financial reporting standards, IFRS

Introduction

The role of information became more important due to rapidly changing technical conditions, market and economic regulations in our globalising world. Companies in Hungary and all over the world have faced with a series of new challenges, such as fulfillment of globalization, liberalization of trade and capital markets, accelerated spreading of different information and communication techniques. Along with it, investors can obtain information very quickly, and can sell their interests or buy new ones from any cormer of the world. (TARNÓCZI-FENYVES, 2010) The most significant group of information is which has great market value and economic content. This statement is corroborated by the opinions of leaders of fullprofit companies, which was the result of BÁCSNÉ's Change Management studies (2011).

In the process of globalization we can identify some major factors, such as:

- rapid flows of capital,
- broading corporate relations,
- crossing national borders,
- extensive investment possibilities, etc.

As a result of this process there's a basic need for unified accounting language, interpretation and valuation system in order to get information, which are clearer, and more comparable at international level that lowers information gap (NAGY, 2004).

In a previous work (ORBÁN, 2006) I've tried to present those information-systems (namely System of Agricultural Accounts, the Farm Accountancy Data Network and accountancy information system), which were significant in agricultural decision-making, in judgement of the activity and income of businesses. Although, each of the various income calculation systems tends to present performance and income generated by agricultural activities, there can be significant deviations between reported incomes due to differing performance evaluation and income calculation methods. The comparative analysis of income calculation methods of the European Union and some of its member states (Great–Britain, The Netherlands, Hungary) showed that despite the seemingly single European regulation, there are still differences (various income categories, opportunity cost calculations, etc.) among income calculation practices of certain countries, and these deviations result in different incomes.

By means of unveiling deviations between performance evaluation and income calculation methods used in the states of the European Union, we can draw nearer to interesting data revealed during comparison of enterprises working in the same field, to specifying generated profit, and to better judgement of earning position of businesses. This demand has created a commonly accepted rule-system, which name was International Financial Reporting Standards (IFRS).

In this paper I tend to present the statements, definitions and factors, which can have great influence in representing

the performance, income of the company in the frame of the IFRS, and reveal the differences between the other accounting regulations (EU directives, Hungarian Accounting Act) in this field.

Radical changes in the field of accounting and financial reporting – IFRS

Recognition that information in different statements is inconsistently presented and that many kind of evaluation method exist in the practice led to the demand of properly assess the financial health of an organization. This fact could be very important after the Enron scandal (2001) and financial crisis of 2008.

"The International Accounting Standards Regulation will introduce a new era of transparency and put an end to the current Tower of Babel in financial reporting. It will help European firms to compete on equal terms when raising capital on world markets and allow investors and other stakeholders to compare companies' performance against a common standard." Frits Bolkestein, Former EU single market commissioner (I1)

The International Financial Reporting Standards (IFRS) are guidelines and rules set by the International Accounting Standards Board (IASB) that companies and organizations can follow when compiling financial statements. The creation of international standards allows investors, organizations and governments to compare the IFRS-supported financial statements with greater ease. (I2) The International Financial Reporting Standards were previously called the International Accounting Standards (IAS).

IFRS brings a radical change to financial statement presentation (BENZACAR, 2009), because "how an entity presents information in its financial statements is vitally important because financial statements are a central feature of financial reporting — a principal means of communicating financial information to those outside an entity."

There are three objectives associated with the change. Information should be presented in the financial statements in a manner that (BENCAZAR, 2009):

"(a) Portrays a cohesive financial picture of an entity's activities. A cohesive financial picture means that the relationship between items across financial statements is clear and that an entity's financial statements complement each other as much as possible. (b) Disaggregates information so that it is useful in predicting an entity's future cash flows. (c) Helps users assess an entity's liquidity and financial flexibility."

Moving toward the IFRS is the most significant change in the accounting and financial reporting for most companies, as using it indicates more requirements in the field of planning, data and information system installation, companies' valuation by investors, customers, shareholders, analysts, rating agencies, or managing the balance sheet and the performance of the company. Nowadays, IFRS regulation affects more than 7.000 companies across the European Union, and it is likely to influence others in neighbouring countries, even over 100 countries use the system of IFRS all over the world.

So, why it is important, why the world needs IFRS? In order to:

mainly:

- integrate financial reports prepared by different principles,
- decrease additional costs emerged due to different reports' comparison,
- reach unified measurement of performance of different countries' entities, and
- coordinate company reports,
- gain asset for increasing confidence,
- enhance the comparability, consistency, transparency and reliability of financial statements prepared by publicly traded companies,
- recognise and manage potential business risks in investment in time,
- reach better access to capital market,
- increase efficiency of market,
- decrease cost of capital,
- increase competitiveness,
- protect investors and the maintain confidence in the financial markets.

"In order to contribute to a better functioning of the internal market … these standards should, wherever possible and provided that they ensure a high degree of transparency and comparability for financial reporting in the Community, be made obligatory for use by. … For each financial year starting on or after 1 January 2005, all publicly traded Community companies shall prepare their consolidated accounts in conformity with the international accounting standards …." (I3) This is the reason why IFRS/IAS and related IFRIC/SIC are obligatory to the enterprises registered on the Stock Exchange. We have to state here, that member states can require or permit other companies to comply with IFRS.

Definitions of the elements relating to performance

Definitions in the Framework of IFRS

Frameworks create the conceptual basis for IFRS, it (I4):

- a cohesive understanding of IFRSs (Framework facilitates consistent and logical formulation of IFRSs),
- a basis for judgement in applying IFRSs (Framework established the concepts that underlie the estimates, judgements and models on which IFRS financial statements are based),
- a basis for continuously updating IFRS knowledge and IFRS competencies.
- In the Framework we can find definitions of the elements directly related to performance (income statement), such as (I5):
- ***Income***: Income is increases in economic benefits during the accounting period in the form of inflows or enhancements of assets or decreases of liabilities that result in increases in equity, other than those relating to contributions from equity participants.

- ***Expense***: Expenses are decreases in economic benefits during the accounting period in the form of outflows or depletions of assets or incurrences of liabilities that result in decreases in equity, other than those relating to distributions to equity participants.

The definition of income encompasses both revenue and gains. "***Revenue*** arises in the course of the ordinary activities of an entity and is referred to by a variety of different names including sales, fees, interest, dividends, royalties and rent. ***Gains*** represent other items that meet the definition of income and may, or may not, arise in the course of the ordinary activities of an entity. Gains represent increases in economic benefits and as such are no different in nature from revenue. Hence, they are not regarded as constituting a separate element in the IFRS Framework." (I5)

The definition of expenses encompasses losses as well as ordinary activities related expenses. "Expenses that arise in the course of the ordinary activities of the entity include, for example, cost of sales, wages and depreciation. They usually take the form of an outflow or depletion of assets such as cash and cash equivalents, inventory, property, plant and equipment. ***Losses*** represent other items that meet the definition of expenses and may, or may not, arise in the course of the ordinary activities of the entity. Losses represent decreases in economic benefits and as such they are no different in nature from other expenses. Hence, they are not regarded as a separate element in this Framework." (I5)

Profit, however, is not explicitly defined in the Framework. "The Framework does not define profit or loss, and nor does it provide criteria for distinguishing the characteristics of items that should be included in profit or loss from those items that should be excluded from profit or loss." (I6) From our study we know that profit is equal income less expenses, so income increases it, expense reduces it. It curious, but we can say that profit is not equal to income less expenses as defined in the Framework (this deviation led to the total comprehensive income, OCI term later, but it doesn't have definition in the Framework). HERCZEG, 2009 shows that profit can be examined in connection with the equity, however the dispersion of individual results is very significant also in economic organisations.

BARKER, 2010 identifies that the Framework, which is central to financial reporting under IFRS, incorrectly defines the income and expenses in the financial statements, not with the logic of doubly-entry accounting. These are defined as changes in assets, rather changes in equity. As Framework is the conceptual basis for the presentation of statements which aim is to show the financial performance of the company, it is unacceptable and incomprehensible to define such a concept. "Profit is not a change in assets: that is not the way double-entry accounting works. If the simple and accurate communication of financial information is valued, profit should be described to be what it is, rather than what it is not." (BARKER, 2010)

Definitions in IAS1

IAS 1 Presentation of Financial Statements sets out the overall requirements for financial statements, (structure, minimum requirements for content, overriding concepts, etc). The standard requires a complete set of financial statements to comprise a statement of financial position, a statement of profit or loss and other comprehensive income, a statement of changes in equity and a statement of cash flows. (I7)

As the Framework defines (good or bad way) the assets, liabilities, income or expenses, IAS 1 doesn't deal with them more. As we stated above, profit is undefined in the Framework. The demand for the presentation of total income has led to the introduction of total comprehensive income, which is a metric that is not defined in the Framework and this is why it lacks conceptual merit. "Total comprehensive income is the change in equity during a period resulting from transactions and other events, other than those changes resulting from transactions with owners in their capacity as owners" (I7), from transactions and other events and circumstances from non-owner sources. The statement of comprehensive income illustrates the financial performance and results of operations of a particular company or entity for a period of time. Financial performance is presented in the form of the statement of profit or loss and other comprehensive income.

IAS 1 defines profit or loss as the total of income less expenses, excluding the components of OCI, and prescribes line-items for profit or loss (I10). Curiosity of this profit or loss statement: no extraordinary items in it. Expenses may be classified by nature (NOE) or by function (FOE).

Term and statement of comprehensive income

Income statement is a financial statement that summarizes the various transactions of a business during a specified period, showing the net profit or loss. Income statement/ profit or loss statement measures a company's financial performance over a specific accounting period, indicates how the revenue (money received from the sale of products and services) is transformed into net income (the result after all expenses and taxes).

International Financial Reporting Standards do not prescribe the exact format of the income statement but we can get a better picture from IFRS Taxonomy. IFRS tend to use the statement of comprehensive income instead of the income statement. Statement of comprehensive income aggregates income statement and other comprehensive income which is not reflected in profits and losses.

IAS 1 permits the statement of comprehensive income to be presented as a choice of the entity (I7):

- in a single ***statement of comprehensive income*** (similar to general income statement in that it calculates a subtotal for net income and then has a section for other comprehensive income, OCI),
- in two statements: ***a statement of profit or loss*** (separate income statement displaying components of

profit or loss) and ***a statement of other comprehensive income*** (that begins with profit or loss, the bottom line of the income statement) and displays components of other comprehensive income).

Total comprehensive income for a period includes profit or loss for that period plus other comprehensive income recognised in that period. "As a result of the 2003 revision to IAS 1, the Standard is now using 'profit or loss' rather than 'net profit or loss' as the descriptive term for the bottom line of the income statement." (I7) OCI includes items of income or expense, that are not recognized in profit or loss as required or permitted by other IFRS. (I10)

The components of other comprehensive income include (I7):

- changes in revaluation surplus (IAS 16 Property, Plant and Equipment and IAS 38 Intangible assets),
- actuarial gains and losses on defined benefit plans recognised in accordance with IAS 19 (employee benefits),
- gains and losses arising from translating the financial statements of a foreign operation (IAS 21 The effects of changes in foreign exchange rates),
- gains and losses on remeasuring available-for-sale financial assets (IAS 39 Financial Instruments: Recognition and Measurement),
- the effective portion of gains and losses on hedging instruments in a cash flow hedge (IAS 39Financial Instruments: Recognition and Measurement).

As we can see in the 1. table in the IFRS column, the statement of comprehensive income should include the following minimum items (I7):

(income statement part)

- revenue,
- finance costs,
- share of the profit or loss of associates and joint ventures accounted for using the equity method,
- tax expense,
- a single amount comprising the total of (i) the post-tax profit or loss of discontinued operations and (ii) the post-tax gain or loss recognised on the disposal of the assets or disposal group(s) constituting the discontinued operation,
- profit or loss, (+ statement of other comprehensive income part)
- each component of other comprehensive income classified by nature,
- share of the other comprehensive income of associates and joint ventures accounted for using the equity method,
- total comprehensive income.

The following items must also be disclosed in the statement of comprehensive income as allocations for the period (I7):

- profit or loss for the period attributable to non-controlling interests and owners of the parent,
- total comprehensive income attributable to non-controlling interests and owners of the parent

Additional line items may be needed to fairly present the entity's results of operations, widen the format is permitted to the entities.

The category of extraordinary profit/loss doesn't exist in the statement of comprehensive income, no items may be presented in this statement (or in the income statement, if separately presented) nor in the notes as extraordinary items.

Certain items must be disclosed separately either in the statement of comprehensive income or in the notes, including (I7):

- write-downs of inventories to net realisable value or of property, plant and equipment to recoverable amount, as well as reversals of such write-downs,
- restructurings of the activities of an entity and reversals of any provisions for the costs of restructuring,
- disposals of items of property, plant and equipment,
- disposals of investments,
- discontinuing operations,
- litigation settlements,
- other reversals of provisions.

The methods of presenting the income in the above mentioned statements are the same in the IFRS, in the EU (4. directive) and in Hungary, too (Hungarian Accounting Act, 2000. C Act). *(1. Figure)* Expenses recognised in profit or loss should be analysed either by nature (raw materials, staff costs, depreciation, etc.) or by function (cost of sales, administrative expenses, etc). If an entity categorises by function, then additional information on the nature of expenses – at a minimum depreciation, amortisation and employee benefits expense – must be disclosed.

Comparison of income statement regulated by IFRS/IAS, EU Directive and the Hungarian Accounting Act

In order to get a clear picture about the differences between the reports, and the income statements in particular, and also to set the IFRS on the map of accounting and reporting, I've made a comparison of the IFRS, EU 4. Directive and the Hungarian Accounting Act in the field of performance's representation. I've summarized my results in the *Table 1.*

As a result of my comparison I've stated that the Hungarian regulation aiming the presentation of performance is closer to the EU 4. Directive as a consequence of harmonization during the process of joining the EU. The regulation is the same in the following fields *(Table 1.):*

- 2. Orientation of regulation,
- 3. Components of financial statements,
- 4. Business report disposals of items of property, plant and equipment,
- 5. Format of income statement/profit or loss statement (and of the balance sheet),
- 6. No separate "other comprehensive income" statement,
- 7. Methods of income statement,
- 9. Presentation of extraordinary items
- 10. Presentation of dividends, earning per share (EPS),
- 11. Presentation of discontinued operations.

Table 1: Comparison of Income statements regulated by IFRS/IAS, EU Directive and the Hungarian Accounting Act

	IFRS/IAS	EU Directive	Hungary: Accounting Act (2000. C. Act)
1. Scope of regulation	Use of IFRS/IFRIC is obligatiory to the entities who made decisions about it.	Use of directives is obligatory to the member states; they have to integrate them into their own law.	Use of Act is obligatory to all business forms, which are specified in the Act.
2. Orientation of regulation	Particular topics	Report as a whole	Report as a whole
3. Components of financial statements	• A statement of financial position (balance sheet) • a statement of comprehensive income for the period (or an income statement and • a statement of comprehensive income) • a statement of changes in equity for the period a statement of cash flows for the period • notes, comprising a summary of accounting policies and other explanatory note	• the balance sheet • the profit and loss account • the notes to the financial statements	• the balance sheet • the profit and loss account • the notes to the financial statements
4. Business report	No regulation	Obligatory, but not as a part of the report	Obligatory, but not as a part of the report
5. Format of income statement/ profit or loss statement (and of the balance sheet)	No strict regulation, or scemes just recommendation for the format of income statement.	Obligatory sequence of the items, optional format	Obligatory sequence of the items, optional format
6. Other comprehensive income	Companies have to present their all comprehensive income for a period: • in a single statement (all items of income/ expense) • in two statements (an income statement and a statement of comprehensive income)	No separate statement	No separate statement
7. Methods of income statement	By nature and by function of expenses (NOE or FOE)	By nature and by function of expenses	By nature and by function of expenses
8. Main lines/categories in income statement	As a minimum, a company shall include in the statement of (comprehensive) income the following lines (1. IAS): • Revenue • Finance costs • Share of the profit or loss of investment in associates and jointly controlled entities (accounted for using equity method) • Tax expense • A single amount comprising the total of (i) the post-tax profit or loss of discontinued operations and (ii) the post-tax gain or loss recognised on the disposal of the assets or disposal group(s) constituting the discontinued operation • Profit or loss • Each component of other comprehensive income classified by nature • Share of the other comprehensive income of associates and joint ventures accounted for using the equity method • Total comprehensive income	Main lines in the income statement (no obligatory categories or groups): 1. Net turnover. 2. Variation in stocks of finished goods and in work in progress. 3. Work performed by the undertaking for its own purposes and capitalised. 4. Other operating income. 5. (a) Raw materials and consumables. (b) Other external expenses. 6. Staff costs: (a) wages and salaries; (b) social security costs, with a separate indication of those relating to pensions. 7. (a) Value adjustments in respect of formation expenses and of tangible and intangible fixed assets. (b) Value adjustments in respect of current assets, to the extent that they exceed the amount of value adjustments which are normal in the undertaking concerned. 8. Other operating expenses. 9. Income from participating interests, with a separate indication of that derived from affiliated undertakings. 10. Income from other investments and loans forming part of the fixed assets, with a separate indication of that derived from affiliated undertakings. 11. Other interest receivable and similar income, with a separate indication of that derived from affiliated undertakings. 12. Value adjustments in respect of financial assets and of investments held as current assets. 13. Interest payable and similar expenses, with a separate indication of amounts payable to affiliated undertakings. 14. Tax on profit or loss. 15. Profit or loss after taxation. 16. Other taxes not shown under items 1-15. 17. Profit or loss for the financial year.	Main (obligatory) categories in the income statement: • Operatnig profit or loss • Result on financial transactions • Profit/loss on ordinary activities • Extraordinary profit • Profit before tax • Tax liability • Profit after tax • Use of retained earnings for dividends • Approved dividends • Profit or loss for the year

	IFRS/IAS	EU Directive	Hungary: Accounting Act (2000. C. Act)
9. Presentation of extraordinary items	Not existing category	Different from ordinary activities (separate presentation)	Different from ordinary activities (separate presentation)
10. Presentation of dividends	Obligatory presentation of Earning per share, EPS (IAS 33)	No obligation for separate presentation of dividend nor EPS.	Obligatory: presentation of amount of Approved dividends No obligation for presentation of EPS.
11. Presentation of discontinued operations	Presentation in the income statement (not extraordinary activities) or in the Notes (IFRS 5)	Presentation in the Notes	Presentation in the Notes
12. Connection with the taxation	Effect of IFRS is limited, as they have just informative role It depends on decision-makers of countries	1606/2002 EU Directive permits use of IFRS for individual reports as well, so it can be the basis for taxation	IFRS are no licensed for individual reports, so it cannot be the basis for taxation

Source: Own presentation by KOROM et al, 2001 and ORBÁN, 2006 and I8 and I9

Main lines/categories in income statement are various *(Table 1., 8. line):* IFRS and the 4. Directives just state the minimum, or main lines, but there are no obligatory categories, while Hungarian Accounting Act determines obligatory categories such as Operating profit or loss, Result on financial transactions, etc.

Role and significance of IFRS, IFRS-based report and income statement is increasing, but nowadays connection between the profit or loss statement and the taxation is not commonly regulated:

- as use of IFRS/IFRIC is obligatiory to the entities who made decisions about it, but basically they've got just informative role, the taxation depends on decision-makers of countries,
- use of directives is obligatory to the member states, 1606/2002 EU Directive permits use of IFRS for individual reports as well, so it can be the basis for taxation,
- in the frame of Hungarian Accounting Act IFRS are no licensed for individual reports, so it cannot be the basis for taxation.

On the other hand, the EU accepted the international financial reporting standards to present the financial performance of publicly traded companies, and as EU member state it is obligatory for the Hungarian companies as well. This is the reason why Hungary's present task is taking over the IFRS mentality.

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ASPECTS OF WORKING UKRAINIAN CITIZENS IN HUNGARY

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Abstract: The primary focus of the joint survey, by the National Employment Foundation (OFA) and the researchers of the University of Debrecen in 2009, was to identify the employment characteristics of Ukrainian citizens in Hungary in relation to their impact on the labour market. Our research activities implied the analysis of existing data, relevant scientific literature and a survey questionnaire. For all the target groups, we were guided by the principle of representativity. Statistical analyses and the survey questionnaire were supplemented by in-depth interviews.

Our research findings are instrumental in simplifying the administration of the Foreign Affairs Police, the process of issuing work permits for foreign employees and their access to employment.

The responses given by employees revealed that access to employment in Hungary posed several administrative and official problems for both Hungarian and Ukrainian citizens. Moreover, Ukrainian employees felt a kind of negative discrimination regarding their wages and the conditions of employment as compared to Hungarian employees and they sought remedy from Hungarian official bodies for this problem.

The authors hope to call the attention of competent authorities to structural problems and loopholes in the employment of foreign citizens. If these are corrected, it will not only improve employment conditions for foreign workers, but for Hungarian ones as well.

Keywords: Ukrainian employees, illegal workers, survey, wage level, establishment objectives

1. Introduction

Employees have arrived in Hungary in growing numbers since the second half of the 1990s out of more than 110 countries in the world *(László Gulyás 2008/a; László Gulyás (2008/b).* In Hungary, foreign citizens may take up employment in various ways. The first group includes those who were obliged to obtain their work permit in compliance with prevalent regulations or those who came into contact with labour centres due to registration processes or green card applications following 01 May 2004. If certain conditions of the *Regulation of 8/1999. (10.XI.) SzCsM* (Ministry of Social and Family Affairs) were fulfilled, employment was also accessible without work permit.

There had been considerable modifications in the regulation of employment for foreigners since January 2008. Under the most significant one, the employment of EGT (European Economic Area, EEA) citizens and their relatives had become basically exempt from authorization in jobs requiring qualifications or at least the successful completion of secondary studies. The other modification which is relevant in terms of statistical recording shall specify that employers are bound to notify labour centres of foreigners who need no work permit to have access to the labour market under relevant regulations; thus making available data on foreign employees more comprehensive.

As a result of Hungary's geographical location, our country is one of the borders of the EU and as such, it is primarily significant for Ukrainian workers (*Adler et.al.,* 2006). The most favoured Hungarian regions are in the North-East, in the capital and its agglomeration.

The above mentioned justified our research project, which won the support of OFA, to study the employment characteristics and the labour market impact of Ukrainian citizens in Hungary.

2. Material and method

In processing the literature, a situation report of the European labour market was developed, a general survey was prepared of international workforce migration and competitiveness, a summary was compiled of foreign employees in Hungary; moreover, we discussed the development of cross-border regions, Euro-regions and cross-border commuting.

We started our investigations with the statistical analysis of secondary data – the most significant markers of Ukrainian and Hungarian labour market, alternative income, Ukrainian demographic data, migration data from certain counties and the data base of research in Kárpát-Panel. Moreover, we made interviews to identify the employment characteristics of Ukrainian citizens and their labour market impact in Hungary for all the target groups.

Among several sampling techniques, we used the technique of random sampling, including stratified sampling. Our investigations used hypothesis examinations and cross-table analysis. The latter was supplemented with a non-parametric test to explore correlations.

Recommendations by *Babbie* (2003) and *Malhotra* (2005) were taken into account when the questionnaire was compiled. As for its structure, it consisted of questions drafted on the basis of hypotheses postulated for a certain target group. The questionnaire primarily included structured, multiple choice questions, whereas unstructured, open questions were placed at the end of the questionnaire, depending on certain target groups. With the recommendation of *Bruce* (2003) and *Darlene* (2002), control points were integrated in the questionnaires. Based upon *Barbel* (1998), control questions were also included to find out how well-informed respondents were in certain questions and to establish the credibility of other issues in potential uninformed answers.

The first type of questionnaires was prepared for employers and the second one was filled in by citizens who applied for jobs at missions. The questionnaire for the third target group was prepared for employees having already obtained their work permit. A separate questionnaire was compiled for students of Ukrainian citizenship at the University of Debrecen.

During primary data collection, the questionnaires drawn up and tested by our research group were filled by the 4 separate test groups.

1. 1From among the 30000 students studying at the University of Debrecen there were approximately 2390 foreign citizens, including 251 Ukrainian students. The survey questioned all the Ukrainian students and finally the results of 65 questionnaires proved to be suitable for analysis, representing the population statistically.
2. Questionnaires for employers included questions designed for Ukrainian citizens with valid work permits. The sample included 225 people in total.
3. Questionnaires for employers were sent to enterprises employing Ukrainian citizens through the Regional Labour Centre. Directorates could support our research goals in different ways. Enterprises filled in the questionnaires and sent them back to our research group voluntarily. In this way 41 enterprises informed us about their viewpoints. It is noteworthy that the consulted enterprises included several firms which employed a high number of Ukrainian employees.
4. Ukrainian citizens who lodged visa applications to missions in order to pursue occupational activities accounted for a significant segment of the research: 122 people filled in the questionnaires at various missions. This body was selected as each and every employee turned to this office at first if they wanted to take up employment in Hungary. The questionnaire respondents included employees representing several entry categories, in contrast with the category of people who had already taken up employment. As a result, illegal workers could have been removed. Statistical data indicated that in the framework of the related question, employees did not make a statement of their unauthorized employment.

In the survey questionnaire respondents were granted the opportunity to express their own opinion. Depending on the target groups, questions of variable number and structure were drafted with approximately the same content. Open questions provided information on employees' everyday problems, including those regarding employment. Opinions were presented simultaneously with completing the questionnaires, according to target groups.

Statistical analysis and the survey questionnaire were complemented with in-depth interviews. In-depth interviews were made with Ukrainian employees living in Hungary. The 6 interview subjects included 2 university students, one entrepreneur, two intellectuals (employees), and one electrician. 5 of the interview subjects spoke Hungarian and 1 needed the help of an interpreter. Their age ranged from university students in their twenties to employees in their fifties. The respondents had typically stayed in Hungary for several years, each of them more than 5 years.

The research group of the Debrecen University participated in our research. Besides processing the relevant scientific literature, secondary data analysis and larger than projected data collection were carried out, as it is presented on the Figure below. Our qualitative and quantitative findings provided a sound basis for research.

Secondary data were analyzed on the basis of statistical data and research findings ákó, 2001; Balcsók and Dancs, 2001; Balcsók and Dancs, 2004; Baranyi and *Balcsók*, *Baranyi*, 2008; *Dancs and Szabó*, 2004; *Gyurgyik*, 2005; *Kincses*, 2008; *Kruppa*, 2003; *Meyer and Solt*, 1999; *Molnár,* 2005; *Molnár and Orosz*, 2007; *Viszt*, 2005).

More impacting on the value of research was the variety of primary data collection and the selection of several target

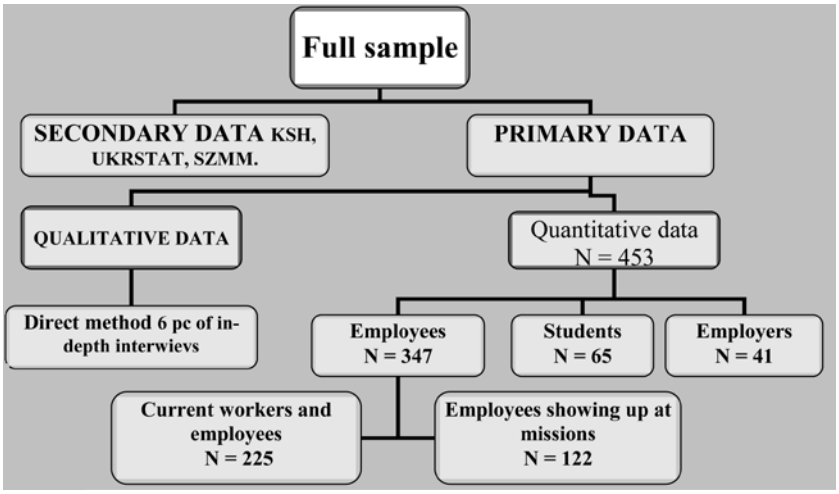

Figure 1: Introduction of the investigated sample
Source: Authors' own work

groups. The special feature of our research was given by the fact that it was not exclusively restricted to actual Ukrainian citizens who took up jobs in Hungary, but we interviewed current and prospective employers as well. We separated the students of the Debrecen University in a group which allowed for the in-depth presentation of Ukrainian citizens' employment characteristics in Hungary.

In our research we gained information on relevant legislation, as follows:

- Labour legislation and legislation for the employment of foreign citizens
- Legislation related to procedures of missions and the Foreign Affairs Police
- Social insurance legislation
- Tax legislation
- Legislation on public administration processes and services

Table 1. presents the research hypotheses as follows:

3. Results and Discussion

3.1. Research findings of hypotheses

3.1.1. The number of employees from Ukraine is likely to grow

In the investigation of the first hypothesis primary and secondary analyses were used. The fact that the number of Ukrainian employees would not grow was supported by several factors. One of the main reasons was economic activity, as the rate of Ukrainian economic activity was considerably higher in Ukraine than in Hungary. At the beginning of the 1990s, after the change regime, the employment strongly decreased in Hungary (Juhász, 2010). Whereas unemployment rate had been continuously growing from 6.4% to 10% since 2000, in Ukraine it had dropped from 11.4% to 6.4%. The index of unemployment rate showed a rather stagnant tendency in Hungary; however, in Ukraine there was a slight growing

Table 1. Hypothese

Name of hypothesis		Data base for the study of the concerned hypothesis
1	The number of employees from Ukraine is likely to grow.	Primary research (q- N=453)
2	The low share of Ukrainian workers in the East-Hungarian region is due to the high employment rate of illegal workers.	Primary research (questionnaire survey- N=412) Primary research (in-depth interview- N=6)
3	Ukrainian employees are mostly employed by building construction enterprises	Employment and Social Affairs Office, 2008: Internal data. Central Statistical Office, 2008 Primary research (questionnaire survey- N=453) Primary research (in-depth interview- N=6)
4	Ukrainian employees are mostly employed as physical workers.	Employment and Social Affairs Office, 2008: Internal data. Central Statistical Office, 2008 Primary research (questionnaire survey- N=453) Primary research (in-depth interview- N=6)
5	The employees are overqualified for their jobs.	Employment and Social Affairs Office, 2008: Internal data. Primary research (questionnaire survey- N=387) Primary research (in-depth interview- N=6)
6	The willingness of Ukrainian workers to do physical work is higher than that of Hungarian ones	Primary research (questionnaire survey- N=453) Primary research (in-depth interview- N=6)
7	The wage level of foreign workers is lower than that of Hungarian ones.	Employment and Social Affairs Office, 2008: Internal data. Central Statistical Office, 2008 Hungarian National Bank, 2009. Primary research (questionnaire survey- N=453) Primary research (in-depth interview- N=6)
8	Ukrainian workers are mostly employees	Employment and Social Affairs Office, 2008: Internal data. Primary research (questionnaire survey- N=453) Primary research (in-depth interview- N=6)
9	Ukrainian workers primarily arrive from Sub-Carpathia.	Primary research (questionnaire survey- N=453) Primary research (in-depth interview- N=6)
10	Ukrainian workers dominantly go to work by public transport vehicles.	Primary research (questionnaire survey- N=453) Primary research (in-depth interview- N=6)
11	In the employment of foreign workers, enterprises are mainly motivated by low staff costs	Primary research (questionnaire survey- N=41)
12	Those employees who find jobs officially mostly arrive in the country to settle down.	Primary research (questionnaire survey- N=453)
13	Established Ukrainian workers mainly arrive from Sub-Carpathia.	

tendency. The next significant fact was that average Ukrainian salaries grewn by almost 4.5 times higher between 2001 and 2008, although the rate of change in the Ukrainian minimum subsistence figure was not considered as significant. Bearing this in mind, employment in Hungary was far from being so promising. As a result of the economic crisis a high number of Ukrainian employees lost their jobs and returned from abroad, especially young people. Many of them joined the army and became professional soldiers to get a safe job despite the relatively low salary. The head of the ÁFSZ (Public Employment Service) counterpart office in Ukrainian claimed there was demand for experts in the Ukrainian labour market.

Hungary's share of Ukrainian workforce is minimal as compared to other countries. The consideration of those countries where Ukrainian citizens work in large numbers indicates that Hungary is very often used as a springboard. In total, access to employment in Russia is the most promising for Ukrainian citizens. Most of Ukrainian new graduates do not even think of working in Hungary; they would rather take up employment in Western Europe, the US and Russia, or stay at home.

The majority of Ukrainian students at the Debrecen University would like to settle down in Hungary. As they are native speakers of Hungarian, they may exert a positive influence on the labour market. Most of the questionnaire respondents knew employees in the circle of their acquaintances who would take up jobs in Hungary in the near future. This fact suggests that the number of Ukrainian employees will not go through considerable changes before long.

Enterprises generating demand are one of the key drivers of the labour market. The majority of enterprises in the survey questionnaire did not intend to create the appropriate (subject to authorization) employment conditions for the employment of not yet employed Ukrainian citizens, whereas they expressed their wish to keep their existing employees.

Therefore, we suggest the hypothesis should be rejected.

3.1.2. The low share of Ukrainian workers in the East-Hungarian region is due to the high employment rate of illegal workers

The analysis of statistical data revealed that most work permits for Ukrainian citizens were issued in the Mid-Hungarian region and the number of Ukrainian workers reaches top values there.

Members of the two target groups – employees and students – were asked about the above statement. The question was, if there were employees in the circle of their acquaintances who commuted to work to Hungary daily or seasonally on the grounds of local border traffic permit, short-stay visa or national residence permit. The majority (60-65 %) did not have acquaintances from the above mentioned category who would illegally take up employment in Hungary. The findings were greatly affected by the labour inspection law, the rate of labour inspection penalty, the control and inspection activities of labour authorities and their associated bodies.

Therefore, we suggest the hypothesis should be rejected.

3.1.3. Ukrainian employees are mostly employed by building construction enterprises

The hypothesis was clearly verified as both the primary and secondary data collection had unveiled that the majority of Ukrainian employees worked in the construction industry.

Therefore we suggest the hypothesis should be accepted.

3.1.4. Ukrainian employees are mostly employed as physical workers

This hypothesis is somewhat intertwined with the previous one, as the majority of employees worked in the construction industry. However, agricultural work and cleaning are also physical activities and there were similar activities in several other areas. Besides secondary data, questions were formed to investigate the given hypotheses in the questionnaire. Answers from the target group of employees verified this presupposition as most employees worked in the physical sector.

Therefore we suggest the hypothesis should be accepted.

3.1.5. The employees are overqualified for their jobs

As for the over qualification of employees we can assert that although two workers claimed that their qualifications were not acknowledged by their employers, the majority worked in appropriate jobs for their qualifications. In total, the number of employees was 387 in our data base and the number of those who did not work in appropriate jobs for their qualifications was merely 7.

Therefore, we suggest the hypothesis should be rejected.

3.1.6. The willingness of Ukrainian workers to do physical work is higher than that of Hungarian ones

This hypothesis formed a very special part of our questionnaire and the issue where to insert it posed a problem: the research group could not predict how respondents would react to certain questions. 70% of the respondents claimed that the willingness of Ukrainian citizens to do physical work was more favourable than that of Hungarian ones.

Therefore we suggest the hypothesis should be accepted.

3.1.7. The wage level of foreign workers is lower than that of Hungarian ones

The comparison of the wage level was performed on the basis of statistical data and the survey questionnaire. The monthly salary average of Ukrainian employees amounted to 100 000HUF (~370 EUR). The findings of our survey questionnaire somewhat differed from this average as 61 % earn 50 000 - 100 000 HUF (~185 – 370 EUR), 28 % earn about 100 000 - 150 000HUF (~370- 555 EUR), and 8 % more than 150 000HUF (~555EUR) on a monthly basis. We support the above hypothesis, as the wage level of foreign employers was lower. KSH (Central Statistical Office) data reveal that the average wage of physical workers was 130 821 HUF (~489

EUR), including the average wage of 115 634 HUF (~432 EUR) in the construction sector. If these figures are compared with the limit value of 50 000 - 100 000 HUF (~185 – 370 EUR), shocking differences emerge. If account is taken of the expectations of employers, it is evident that the wage level of foreign workers was lower.

Therefore we suggest the hypothesis should be accepted.

3.1.8. Ukrainian workers are mostly employees

Statistical data indicate that regarding their numbers Ukrainian workers are one of the most populous layers of employees among foreigners. The answer for the question about occupational activity was indicative of the fact whether Ukrainian citizens worked legally or illegally. This question was supplemented by another one about the type of entry into the country, which proved to be a kind of screening question. In total, answers to the questions suggested that the majority of interwievees worked as employees.

Therefore we suggest the hypothesis should be accepted.

3.1.9. Ukrainian workers primarily arrive from Sub-Carpathia

Research included all the Hungarian missions in Ukraine, of which two are located in Sub-Carpathia (Beregszász and Ungvár) and one office is in Kiev. The answer for the concerned hypothesis was provided on the basis of employees' birthplaces. The first example might be the layer of students of which less than 50% took up jobs; however, after graduation they would boost the Hungarian labour market. 96.9% of students were born in Sub-Carpathia. The same rate is observed in the layer of employees: 96.9% of them were born in Sub-Carpathia as well. The distribution of those who turned up at the mission was rather different, 75% of them were born in Sub-Carpathia. The rate of those who were born in Mid-Ukraine was 23%.

Whereas the questionnaires sent by the mission in Kiev were fulfilled by merely Ukrainians or other foreigners, those ones which arrived from Sub-Carpathian missions were mostly filled in by Hungarian native speakers.

Therefore we suggest the hypothesis should be accepted.

3.1.10. Ukrainian workers dominantly go to work by public transport vehicles

The mode of commuting depended on employees' scope of work, companies and the location of jobs. The question was answered by the help of in-depth interviews. In most cases employees used public transport vehicles, but the area of the capital differed from rural areas in this respect. In Budapest e.g. public transport vehicles make it easy for employees to get to work whereas in rural areas, to reach animal or apple farms, public transport was not easily available. For most rural employees employers arranged transport facilities for their workers and this was also true of some Mid-Hungarian firms, or employees find a joint solution and they used private vehicles (cars) in groups. For rural employees it was typical that they either rode bicycles or walked to work. It can be claimed that the as majority of Ukrainian employees (80%) used public transport to get to work and the remaining 20% were transported to work by other means of transport.

Therefore we suggest the hypothesis should be accepted.

3.1.11. In the employment of foreign workers, enterprises are mainly motivated by low staff costs

Hypothesis 7. further supports Hypothesis 11. Moreover, it may be taken into account that in the questionnaire for employees a considerable number of respondents ranked their need for equal payment with Hungarian employees first among questions about employees' needs. In the questionnaire for employers more than 50% of enterprises ranked the same answer first for the same question. All these suggest that it was clear for the enterprises that foreign labour force was cheaper and it is evident that this is their primary motivation.

Therefore we suggest the hypothesis should be accepted.

3.1.12. Those employees who find jobs officially mostly arrive in the country to settle down

3.1.13. Established Ukrainian workers mainly arrive from Sub-Carpathia

Hypotheses 12 and 13 are discussed jointly as they closely correlate. Most employees worked legally, therefore the two hypotheses lent themselves for joint assessment. 82% of students wanted to settle down including 82% of those who came from Sub-Carpathia.

As for employers, this rate was different compared to students: merely 32% of employees wanted to settle down. All who wanted to settle down were from Sub-Carpathia.

The third target group, those employees who turned up at missions, showed similar rates: 28% of respondents liked to settle down, out of which 94% had come from Sub-Carpathia.

Hypothesis 12 should be rejected as merely a part of the studied employees wanted to settle down in Hungary.

We suggest Hypothesis 13 should be accepted as more than 80% of those who wish to settle down were Sub-Carpathians.

3.2. Experience gained through in-depth interviews

The interviewed students came to study in Hungary mostly because their Ukrainian language skills were so poor that they could satisfy Hungarian education requirements easier. In contrast with Ukrainian diplomas, they thought they could benefit from their Hungarian diplomas in several ways. On one hand, the level of education was higher and their diploma would be generally acknowledged in other countries in the European Union as well. The students were closely tied to Hungary, but they regarded Ukraine as their home country. Regardless of this fact, they found it significant to obtain Hungarian citizenship with the advantages of greater

freedom, transit opportunities between countries and potential employment. It was typical of Ukrainian students that they worked as members of the University student association; therefore they could get jobs under the same conditions as Hungarian students. However, the terms and conditions of obtaining various permits and the advantages provided by the concerned permits, especially getting their visas posed relatively great challenges for them.

One interview subject, whose opinion partially differed from Hungarian speaking employees of Hungarian nationality, spoke only in Ukrainian. The main difference was that while the subjects of Hungarian nationality claimed that they faced negative discrimination in jobs, the Ukrainian speaker did not experience such discrimination and stated that qualifications and the quality of work were decisive instead of nationality.

One of the most significant motivations of taking up jobs in Hungary was family ties, as a considerable number of Ukrainian employees had Hungarian spouses or close relatives. They found it much easier to find jobs in Hungary, access to employment was more structured and once they were employed, work culture and working conditions were better, laws were more respected and corruption was lower.

A low rate of job fluctuation is typical of all the interview subjects; they had worked in their first jobs without exception since the beginning of their employment.

Those who worked in Hungary had regarded Ukrainian citizens' employment opportunities increasingly worsening in previous years, especially the year before, but they hoped that determined employees with good qualifications could find jobs for themselves.

Ukrainian employees of Hungarian nationality wonted to expect that they should not be judged in the process of employment authorization in Hungary under the same conditions as other foreigners. This fact might incite them to obtain their Hungarian citizenship, although it was not equally important for each of them. Especially young people thought that citizenship was merely one of the preconditions of greater freedom.

Ukrainian employees thought that they were more devoted and motivated to work than their Hungarian counterparts, as losing their jobs would entail higher disadvantages for them. In Hungary they had to concentrate on their work better as in many cases they lived without families and there was nothing else to engage their attention. It also "argues in favour of Ukrainian employees" that they took up the concerned jobs for lower wages in many instances.

One of the interviewed subjects claimed that the problem-solving skills of Ukrainian employees were better than that of Hungarians. A potential explanation for this might be that they arrived from adverse working conditions to work in better ones and they had been used to solving problematic issues on their own without expecting external financial or any other kind of support.

In terms of establishing Ukrainian companies in Hungary, Ukrainian citizens found difficulties in their insufficient knowledge of the process of establishment and operation. They claimed that getting the concerned information was difficult as they could not find a place or an institution which they can turn to in the hope of smooth administration (setting up a company or other issues).

4. Conclusion

The responses given by employees reveal that access to employment in Hungary poses several administrative and official problems for both Hungarian and Ukrainian citizens. Moreover, Ukrainian employees feel a kind of negative discrimination regarding their wages and the conditions of employment as compared to Hungarian employees and they seek remedy from Hungarian official bodies for this problem.

Dual citizenship from the viewpoint of Ukrainian employees

Our findings indicate that in many cases employees decided to settle down, which was a costly process, because they might get into better positions and easier access to job opportunities under equal conditions with their Hungarian counterparts. To mention some of these advantages: equal wages or freedom to move on the labour market.

The same can be stated in relation to students: excellent students very often choose among higher educational institutions depending on the rate of tuition fee, as being Ukrainian citizens they were not entitled to take state-subsidized diploma courses. There are several examples to illustrate the phenomenon that students merely worked to get officially recorded salary which was one of the pre-conditions of settling down and once the person received the "established" status, the job was not needed any longer. In all these cases it can be observed that the given student was almost immediately taken over to state-subsidized training; although, depending on institutions, one of the primary conditions included at least a good average of students' grades. The solution of this problem might be the use of scholarships for Hungarians from Ukraina, but a reaction for this might be: "what happens if somebody would not like to return to his/her home country after graduation", as his/her career opportunities were more promising in Hungary?

Ukrainian employees of Hungarian nationality generally voiced the opinion that their judgement by the mother country should have been more favourable as that of non-Hungarian foreign citizens. Our research findings suggested that offering the possibility of free movement in Hungary and also employment opportunities for Ukrainian citizens of Hungarian nationality would not pose economic risks for Hungary. The potentials of granting dual citizenship had to be taken into account for Ukrainian citizens of Hungarian nationality, which perhaps would give them more restricted rights than for native Hungarian citizens, but it would provide free movement and employment for Ukrainian citizens of Hungarian nationality.

The introduction of dual citizenship could expedite employment conditions and would clearly simplify the administration of legal employment.

Simplification of office routine

Most respondents claim that complicated office routine was the primary obstacle in access to employment in Hungary. They agreed that the most important objective was to shorten the deadline of office routine and to cut visa costs. However, the minimum inspection period of employee demand had been modified (shortened) and the deadline for individual work permit applications had also been shortened recently.

Extension of the scope of Hungarian certificates

Most Hungarian-speaking employees arrived from Ukraine; therefore access to legal employment would become easier by the extension of the scope of Hungarian certificates and the introduction of simplified office routine. As a result, the number of illegal Ukrainian employees might decrease, which would improve the safety of Ukrainian citizens who worked illegally at that time and that of their employers; as well as it would guarantee legality for the Hungarian state.

Administration in employment offices and investigation on the system of supervision

Statistical findings reveal that mostly the Employment Centres of Mid-Hungary were involved in the issue of permits. The respondents found it a good idea that notification of labour demand took place in employment offices and besides the Regional System of Employment Offices, work permits were issued in each county in a practical, customer friendly way.

We suggested that the work of Employment Centres and Labour Inspectorates should have been further enhanced as it was disputable whether employees sent notifications of the failure or the termination of employment before the date stipulated by the work permit despite their legal obligations. It also cannot be excluded that Ukrainian citizens who possessed work permits and residence permits entitling them to take up occupational activities, might actually work in other countries of the Shengen zone, so the de facto number of Ukrainian employees were not equal with figures in official records.

Office routine for Ukrainian employees

Besides the problems of bureaucratic office routine, a part of Ukrainian employees, mostly those of Hungarian nationality, found it prejudicial that both Ukrainian and Hungarian office staff failed to show readiness to help and empathy for them. As soon as they found out that the potential employees were of Ukrainian citizenship, clerks immediately became distant with them. However as office routine was a stressful, strained situation for Ukrainian employees, it was very difficult for applicants to make objective judgements. The improvement of communication skills for customer service staff was likely to expedite the process to become more effective, fruitful and comfortable for customers.

Employment for university students

Several Ukrainian university students worked during their academic years which – as stated in their responses - they could not get acknowledged as working in Hungary. Later it would be detrimental for them as compared to Ukrainian workers who possessed work permits. Therefore, it should have been considered that student work or perhaps the education period might be counted as work for foreign students in order to help qualified people with their access to employment.

Informedness of Ukrainian employees and the structure of access to employment

Inadequate informedness about employment possessed a general problem for Ukrainian employees in Hungary. Information was sometimes very difficult for them to gain and they often got it from other Ukrainian citizens already working in Hungary. Employment abroad was mediated by illegal agents in Ukraine who refuse to take guarantee of the success of their activities. Therefore, legal workers of official employment agencies should have got opportunities to assist Ukrainian citizens in their access to employment in Hungary.

Closure

After our research Hungarian Citizenship Act was amended witch states: „A non-Hungarian citizen whose ascendant was a citizen of Hungary, or who demonstrates the plausibility of his or her descendent from Hungary, and provides the knowledge of the Hungarian language, following the amendment of the Citizenship Act, can get access to Hungarian citizenship through preferential but not automatic naturalization (*Ministry of Foreign Affears of Hungary*, 2011)." With this Act the possibilities, of Hungarian people living in Ukraine and other foreign countries, to be a Hungarian citizen have been increased significantly. Hopefully our effort was a contribution to the improvement of the possibilities of many Ukrainian workers in Hungary. However the status of other working Ukrainian citizens in Hungary was not affected by the Hungarian Citizenship Act.

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BIOENERGY: RISKS TO FOOD-, ENERGY- AND ENVIRONMENTAL SECURITY

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Abstract: There are growing opportunities and demands for the use of biomass to provide additional renewables, energy for heat, power and fuel, pharmaceuticals and green chemical feedstocks. However, the worldwide potential of bioenergy is limited, because all land is multifunctional, and land is also needed for food, feed, timber and fiber production, and for nature conservation and climate protection. The recent expansion of the bioenergy industries together with a strong increase in many commodity prices has raised concerns over the land use choices between energy needs and food and feed. New systems of energy production must be developed based on cost of environmental damage due to production and use of fossil energy and certain chemicals and materials. This article presents risks to food and energy security, estimates of bioenergy potential and the challenges of the environmental and social impact associated with expansions in bioenergy production.

Key words: food security, energy security, bioenergy production, biomass potential, environmental impact

1. Introduction

The world's population continues to grow and, over the next 40 years, agricultural production will have to increase by some 60%. Higher food, feed and fiber demand will place an increasing pressure on land and water resources, whose availability and productivity in agriculture may themselves be under threat from climate change. The additional impact on food prices of higher demand for crops as energy feedstock is of real concern.

In the last 35 years global energy supplies have nearly doubled but the relative contribution from renewables has hardly changed at around 13%. Continued reliance on fossil fuels will make it very difficult to reduce emissions of greenhouse gases that contribute to global warming. Bioenergy currently provides roughly 10% of global supplies and accounts for roughly 80% of the energy derived from renewable sources. Bioenergy was the main source of power and heat prior to the industrial revolution. Since then, economic development has largely relied on fossil fuels. A major impetus for the development of bioenergy has been the search for alternatives to fossil fuels, particularly those used in transportation. The renewed interest in biofuel is driven by a range of considerations, including climate change and the potential economic contribution of the development of the biofuel industry in terms of income and employment.

The development of biofuels has been one of the most visible and controversial manifestations of the use of biomass for energy. Furthermore, an ongoing debate about the benefits of reliance on biofuels derived from food crops and concern about the efficacy of current biofuels policies may contribute to the doubts of future policy. While biofuel has the potential to be more environmentally friendly in terms of reduced greenhouse gas (GHG) emissions, it may have unintended negative environmental consequences, particularly relating to changes in land use. Characterizing and quantifying the relationship between biofuel production and the environment poses a considerable challenge. In combination with an improved assessment of the effects of indirect land use change and an expansion of sustainability criteria to biomass production in general could help in integrating energy, agricultural, environmental and international trade policies to develop renewable energy in a sustainable way. A broader, more integrated approach is needed to energy policy, embracing all renewable energies that reduce GHG emissions without serious side-effects.

2. Material and methods

The paper is based on publications addressing the effect of bioenergy expansions in terms of food- energy-,

environmental and social security. Data published in various international journals and books were used in the analysis. The database of the Organisation for Economic Co-operation and Development, Food and Agriculture Organization of the United Nations, International Energy Agency, Intergovernmental Panel on Climate Change, European Commission has also been used in the examination. The literature on the impacts of bioenergy expansions is already substantial. Several reports have addressed the effects of bioenergy on food, energy and the environment. However, the effects of bioenergy, first of all biofuel, production on land use and GHG emissions have received much less attention. Furthermore, there is a lack of available publications related to the feed value of increasing biofuels by-products, which are supposed to be credited with the area of cropland required to produce the amount of feed they substitute. The use of individual studies is furthermore hampered by the fact that these studies might use totally different methodologies (and motivations) to assess the environmental and social effects of bioenergy expansion. In addition, results are potentially biased because studies might differ in their focus on potential or realized effects, their use of different baselines for comparisons and other background conditions. Most studies and surveys capture information only over a short period of time, longer-term market responses to the expansion of bioenergy are not reflected in the analysis.

3. Results

Land use for food and feed are typically determined by global diet and agricultural yield improvements. Helping farmers lose less of their crops will be a key factor in promoting food security. Due to high dependence of the global food sector on fossil fuels the volatility of energy markets can have a potentially significant impact on food prices leading to increasing food insecurity.

In the last 35 years global energy supplies have nearly doubled but the relative contribution from renewables has hardly changed at around 13%. It is estimated that renewable energy accounts for 13% of the total global primary energy supply, however, the contribution of renewable energy to primary energy supply varies substantially by country and region. The largest contributor to renewable energy with 10% points is biomass (bioenergy), whereas other renewable energy sources account for 3% point. Although the worldwide potential of bioenergy is limited because all land is multifunctional, it still has the highest technical potential for expansion as the largest single source of renewable energy today. The majority of biomass is used inefficiently for traditional domestic cooking, lighting and space heating in developing countries but the share of modern bioenergy use is growing rapidly. Biomass also provides an attractive feedstock for the chemical industry since the use of biogenic fibres will increase in the future.

Projected world primary energy demand by 2050 is expected to be in the range of 600 to 1000 EJ/year compared to current 500 EJ/year. The total annual aboveground net primary production on the Earth's terrestrial surface is estimated to be about 1260 EJ/year, which can be compared all harvested biomass used for food, fodder, fibre and forest products of 219 EJ/year. The global harvest of major crops and industrial roundwood corresponds to about 80 EJ/year. The technical potential for biomass is estimated to be as high as 1500 EJ/year by 2050. However, scenarios taking into account sustainability constraints indicate an annual potential of 200–500 EJ/year representing 40 to 100% of the current global energy use. The expert assessment suggests potential deployment levels of bioenergy by 2050 in the range of 100–300 EJ/year contributing between a quarter and a third of the future global energy mix.

Bioenergy has significant potential to mitigate GHGs if resources are sustainably developed and efficient technologies are applied. The impacts and performance of biomass production and use are region- and site-specific. The precise quantification of GHG savings for specific systems is often hampered by lack of reliable data. Furthermore, different methods of quantification lead to variation in estimates of GHG savings. Nonetheless practically all bioenergy systems deliver large GHG savings if they replace fossil-based energy and if the bioenergy production emissions – including those arising due to land use change – are kept low.

Biomass for energy is only one option for land use among others, and markets for bioenergy feedstocks and agricultural commodities are closely linked. The direct land-use change effects of bioenergy production can be controlled through certification systems, wherever biomass is grown. Indirect land-use changes, however, are more difficult to identify. Most current biofuel production systems have significant reductions in GHG emissions relative to the fossil fuels displaced, if no indirect land-use change effects are considered. The debate surrounding biomass in the food versus fuel competition has resulted in the fast development and implementation of sustainability criteria biomass and biofuels certification and standards as voluntary or mandatory systems reducing potential negative impacts associated with bioenergy production. Such criteria do not apply to conventional fossil fuels. A proliferation of standards increases the potential for inefficiencies in the market and abuses such as "shopping" for standards that meet particular criteria. Lack of international systems may cause market distortions instead of promoting the use of sustainable biofuels production. Production of "uncertified" biofuel feedstocks will continue and enter other markets in countries with lower standards or for non-biofuel applications that may not have the same standards.

The transport sector is responsible for about 20% of world primary energy demand. Transport biofuels are currently the fastest growing bioenergy sectors even they represent just 3% of total road transport fuel and only 5% of total bioenergy consumption today. Common transport policies include biofuel subsidies, tax exemptions, blending mandates and the introduction of flex-fuel vehicles. Liquid biofuels for transport are generating the most attention, although only a small fraction of biomass is used globally for biofuels production at present. Changes in land use, principally those

associated with deforestation and expansion of agricultural production for food, contribute about 15% of global emissions of GHG. Currently, less than 3% of global agricultural land is used for cultivating biofuel crops and land use change associated with bioenergy represents only around 1% of the total emissions caused by land-use change globally most of which are produced by changes in land use for food and fodder production, or other reasons. The proportion of global cropland used for biofuels is currently some 2.5% (40 million gross hectares) with wide differences among countries and regions. The biofuel production processes give rise to by-products which are largely suitable as animal feed. By-products are supposed to be credited with the area of cropland required to produce the amount of feed they substitute. By adding by-products substituted for grains and oilseeds the land required for cultivation of feedstocks declines to 1.5% of the global crop area (net land requirement). Based on the land-use efficiencies land use for biofuel production would need to increase from 40 million hectares (21 million hectares net land requirement by adding by-products substituted for grains and oilseeds) to around 100 million hectares in 2050. This corresponds to an increase from 2.5% of total arable land today to around 6% in 2050.

4. Discussion

4.1. Risks to food security

One-quarter of all agricultural land is highly degraded, yet over the next 40 years, agricultural production must increase by 60%, sustainably and with fairer distribution, to provide global food security, a major contributor to social stability (*OECD/FAO, 2012*). For the past decade, yield increases on farms have been limited or static for most major crops despite the increasing genetic potential provided by improved varieties. The need to increase agricultural productivity and efficiency in developed as well as in developing countries is now well accepted. Producing more food sustainably requires crops that make better use of limited resources including land, water and fertiliser.

With respect to diet, consumption of meat and dairy products is an important driver for land use since meat and dairy use a lot more basic agricultural production than does the consumption of grain. Livestock products imply an inefficient conversion of calories of the crops used in livestock feeds. On average, 6 kg of grain is required to yield 1 kg of meat. Meat consumption is projected to rise nearly 73% by 2050; dairy consumption will grow 58% over current levels. The surge in livestock production that took place over the last 40 years resulted largely from an increase in the overall number of animals being raised. Meeting projected demand increases in production will need to come from improvements in the efficiency of livestock systems in converting natural resources into food and reducing waste. This will require capital investment and a supporting policy and regulatory environment. Meat consumption in China alone increased from 27 to 60 kg per person per year between 1990 and 2010. Each additional kg of meat consumption increase in China results in a need for roughly 4–5 million tons of animal feed (*FAO, 2011a*). Roughly one-third of the edible parts of food produced for human consumption, gets lost or wasted globally. Food losses in industrialized countries are as high as in developing countries, but in developing countries more than 40% of the food losses occur at post harvest and processing levels, while in industrialized countries, more than 40% of the food losses occur at retail and consumer levels (*Gustavsson et al., 2011*). We can save also water and energy by reducing losses in the food chain.

Land use change is not a new concept but is something that has been taking place since the beginning of civilization and continues to do so. In this context, agriculture has always been an important driver, so far mostly for food and feed production. A growing world population and a changing diet have led to continuously expanding areas of agricultural land, despite parallel increases in yields from existing cropland. On the other hand cultivated land is tightening due to population growth and accelerated urbanization and motorization[1], changes in lifestyles, falling water tables and diversion of irrigated water towards the cities (*The Earth Institute, 2005*). Future food security depends on the development of the political and logistical capacity to make food accessible everywhere, to every (*FAO, 2011b*). Around 0.9 billion people are undernourished. There will always be risks associated with food supply and thus a need to manage these risks. Domestic food supplies are not less risky than for example energy imports, but it is sensible to plan for systemic risks (such as nuclear fallout, port strikes, etc.). We experience food poverty due to a lack of entitlements, not lack of food availability (*Krugman, 2009*). Future food security depends on the development of the political and logistical capacity to make food accessible everywhere, to everyone.

Bioenergy may compete with the food sector, either directly, if food commodities are used as the energy source, or indirectly, if bioenergy crops are cultivated on soil that would otherwise be used for food production. Both effects may impact on food prices and food security if demand for the crops or for land is significantly large. This issue has typically been of concern for the biofuels sector, which uses mainly food crops. Increased biofuels production could also reduce water availability for food production, as more water is diverted to production of biofuel feedstocks (*FAO, 2011c; IEA Bioenergy, 2009*). Until now, the price increases that this has led to seem to be limited for most crops, and the agricultural sector has responded by increasing production. There are exceptions, though, especially with crops where biofuel demand accounts for a significant share of total demand (e.g. maize, oilseeds, sugarcane).

[1]An estimated 40,000 ha of land are needed for basic living space for every 1 million people added and 20,000 ha of land are needed for every 1 million vehicles added.

4.2. Risks to energy security

The use of fossil fuels by agriculture has made a significant contribution to feeding the world over the last few decades. The food sector accounts for around 30% of global energy consumption and produces over 20% of global greenhouse gas (GHG) emissions. Around one-third of the food we produce, and the energy that is embedded in it, is lost or wasted. The energy embedded in global annual food losses is around 38% of the total final energy consumed by the whole food chain *(Gustavsson et al., 2011).* Due to high dependence of the global food sector on fossil fuels the volatility of energy markets can have a potentially significant impact on food prices, and this would have serious implications for food security and sustainable development *(IPCC, 2011).* Rising energy prices may cause spillovers into food markets leading to increasing food insecurity. Furthermore, any increase in the use of fossil fuels to boost production will lead to greater GHG emissions, which the global community has pledged to reduce *(FAO, 2011c).*

Global primery energy demand is projected to rise from around 12 300 million tons oil equivalent (Mtoe) in 2008 to 16 800 Mtoe in 2035 – an increase of over 35%. On a global basis, it is estimated that renewable energy accounted for 13% of the total 492 Exajoules (EJ)[2] of primary energy supply in 2008 (*IEA Bioenergy, 2009*). The largest contributor to renewable energy with 10% points was biomas. Hydropower represented 2% points, whereas other renewable energy sources accounted for 1% point *(Figure 1).* The contribution of renewable energy to primary energy supply varies substantially by country and region. While oil continues to be the dominant fuel in the primary energy mix, its share of the mix drops from 33% in 2008 to 27% in 2035. Natural gas increases from 21% of the global fuel mix in 2008 to 25% in 2035 becoming the second-largest fuel in the primary energy mix. The share of primary coal demand declines by 5% from 27% in 2008 to 22% in 2035. The share of nuclear power in global primary energy supply increases from 6% in 2008 to 7% in 2035 (*IEA, 2011*). Renewables increase from 13% of the mix to 19% over the same period leading to a decreasing share of fossil fuels in the global primary energy consumption from 87% in 2008 to 81% in 2035 (*Figure 1 and Figure 2*).

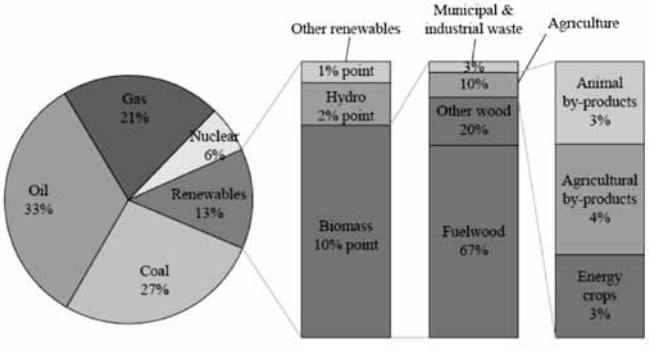

Figure 1: World primary energy demand by fuel in 2008.
Source: IEA Bioenergy, 2009

[2]1 Exajoule = 1018 joules = 23.88 million tons of oil equivalent (Mtoe).

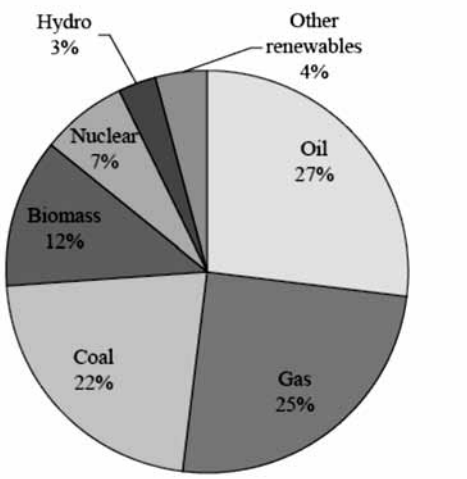

Figure 2: World primary energy demand by fuel in 2035.
Source: IEA Bioenergy, 2009

4.2.1. The increasing competition for biomass: bioenergy potential

Overall, the global share of biomass has remained stable over the past two decades, but in recent years a sharp decline in share can be observed in China due to a rapid growth of total energy consumption and a steady increase of all types of biomass (for electricity, heat and biofuels) in the EU. The worldwide potential of bioenergy is limited because all land is multifunctional and land is also needed for food, feed, timber and fibre production, as well as for nature conservation and climate protection. In addition, the use of biomass as an industrial feedstock (e.g. plastics) will become increasingly important. At present only a small fraction of biomass is used globally for biofuels production and power generation, but these shares are growing rapidly because of issues like energy security, rising fossil fuel prices and, last but not least, global warming concerns and greenhouse gas reduction policies. With demand for energy continuing to rise in absolute terms, the absolute use of biomass will increase even more.

Bioenergy is the largest single source of renewable energy today and has the highest technical potential for expansion amongst renewable energy technologies. In 2008, biomass provided about 10% (50.3 EJ/year) of the global primary energy supply. More than 80% of the biomass feedstocks are derived from wood (trees, branches, residues) and shrubs. The remaining bioenergy feedstocks came from the agricultural sector (energy crops, residues and by-products) and from various commercial and post-consumer waste and by-product streams (biomass product recycling and processing or the organic biogenic fraction of municipal solid waste *(Figure 3).*

The majority of biomass (roughly two-thirds) is used inefficiently for traditional domestic cooking, lighting and and space heating in developing countries. The share of the smaller, modern bioenergy use is growing rapidly. High-efficiency modern bioenergy uses more convenient solids, liquids and gases as secondary energy carriers to generate heat, electricity, combined heat and power, and transport

fuels for various sectors. The estimated total primary biomass supply for modern bioenergy is 11.3 EJ/year or 22% of world biomass demand. Additionally, the industry sector consumes approximately 7.7 EJ of biomass annually or 15% of world biomass demand, primarily as a source for industrial process steam (*IEA, 2011*).

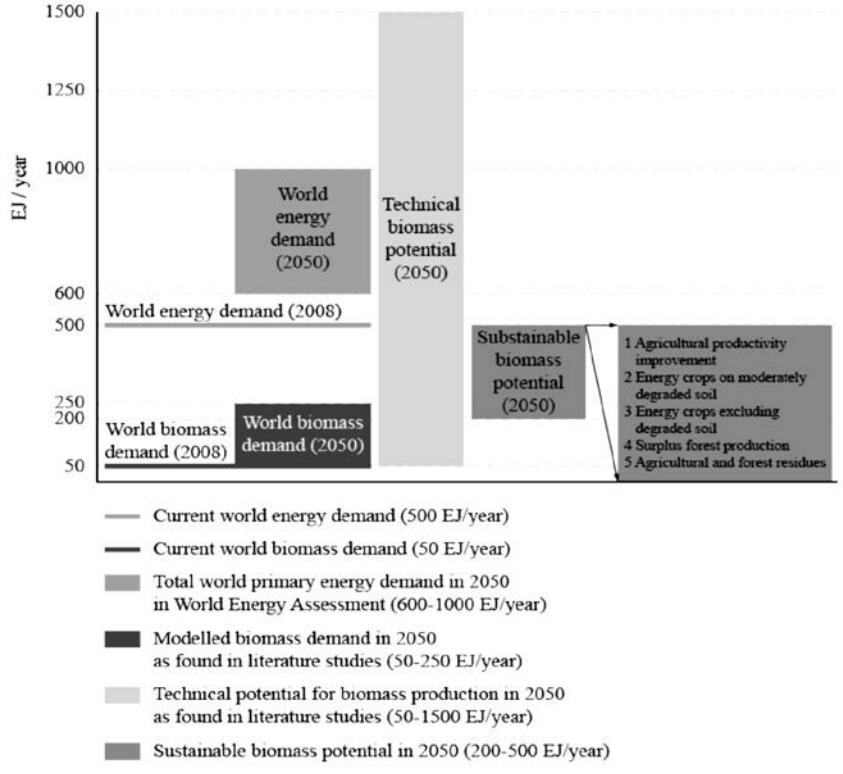

***Figure 3**:* Global bioenergy sources.
Source: IEA Bioenergy, 2009

The total annual aboveground net primary production (the net amount of carbon assimilated in a time period by vegetation) on the Earth's terrestrial surface is estimated to be about 35 Gt carbon, or 1 260 EJ/year assuming an average carbon content of 50% and 18 GJ/t average heating value (*Haberl et al., 2007*), which can be compared to the current world primary energy supply of about 500 EJ/year (*IEA Bioenergy, 2009*). All harvested biomass used for food, fodder, fibre and forest products, when expressed in equivalent heat content, equals 219 EJ/year (*Krausmann et al., 2008*). The global harvest of major crops (cereals, oil crops, sugar crops, roots, tubers and pulses) corresponds to about 60 EJ/year and the global industrial roundwood production corresponds to 15 to 20 EJ/year (*FAOSTAT, 2011*).

Based on this diverse range of feedstocks, the technical potential for biomass is estimated in the literature to be possibly as high as 1 500 EJ/year by 2050 (*Smeets et al, 2007*). However, most biomass supply scenarios that take into account sustainability constraints, indicate an annual potential of between 200 and 500 EJ/year (excluding aquatic biomass owing to its early state of development), representing 40 to 100% of the current global energy use (*IEA Bioenergy, 2009*). Forestry and agricultural residues and other organic wastes (including municipal solid waste) would provide between 50 and 150 EJ/year, while the remainder would come from energy crops, surplus forest growth, and increased agricultural productivity (*Figure 3*).

Projected world primary energy demand by 2050 is expected to be in the range of 600 to 1 000 EJ/year compared to about 500 EJ in 2008. The expert assessment suggests potential deployment levels of bioenergy by 2050 in the range of 100-300 EJ/year. However, there are large uncertainties in this potential, such as market and policy conditions, and there is strong dependence on the rate of improvements in the agricultural sector for food, fodder and fibre production and forest products. The entire current global biomass harvest would be required to achieve a 200 EJ/year deployment level of bioenergy by 2050. Scenarios looking at the penetration of different low carbon energy sources indicate that future demand for bioenergy could be up to 250 EJ/year *(Kampman et al., 2010).* It is reasonable to assume that biomass could sustainably contribute between a quarter and a third of the future global energy mix.

The transport sector is responsible for about 20% of world primary energy demand (94 EJ). Transport biofuels are currently the fastest growing bioenergy sector. However, today they represent just 3% (2.4 EJ) of total road transport fuel consumption and only 5% of total bioenergy (in energy value). At present only a small fraction of biomass (sugarcane, grain, and vegetable oil crop) is used globally for biofuels production, but these shares are growing rapidly because of issues like energy security, rising fossil fuel prices and, last but not least, global warming concerns and greenhouse gas reduction policies. Liquid transport fuels from biomass represent one of the most important options for the sustainable supply of transport fuels *(Kampman et al., 2010).*

Availability of land for non-food crops will be determined by increased yield potential, reducing losses and wastes along the food chain and lower inputs. However, these volumes will remain limited relative to total energy and transport sector fuel demand. Limited biomass resources will be allocated to the sector (materials, chemicals, energy) that is most able to afford them. This will depend on the price of existing fossil fuel products and the relative cost of converting biomass into substitute final fuels such as bio-derived electricity, ethanol blends, biodiesel and bio-derived jet fuel. It will also depend on factors such as cost of alternative fuel and energy sources, government policies including excise rates, and the emission intensity of each sector.

The sustainable use of residues and wastes for bioenergy, which do not require any new agricultural land and present

limited or zero environmental risks, needs to be encouraged and promoted globally. Several factors may discourage the use of these "lower-risk" resources. Using residues and surplus forest growth, and establishing energy crop plantations on currently unused land, may prove more expensive than creating large-scale energy plantations on arable land. In the case of residues, opportunity costs can occur, and the scattered distribution of residues may render it difficult in some places to recover them *(IEA, 2010).* Whatever is actually realised will depend on the cost competitiveness of bioenergy and on future policy frameworks, such as greenhouse gas emission reduction targets.

4.2.2. Biofuels

The transport sector is responsible for about 20% of world primary energy demand (94 EJ). Transport biofuels are currently the fastest growing bioenergy sector. However, today they represent just 3% (2.4 EJ) of total road transport fuel consumption and only 5% of total bioenergy (in energy value). Liquid biofuels for transport are generating the most attention and have seen a rapid expansion in production. World fuel ethanol production amounted to 1.8 EJ and biodiesel production increased to 0.6 EJ in 2010. Liquid biofuels make a small but growing contribution to fuel usage worldwide. In 2010 they covered about 3% (2.4 EJ) of global road transport fuel consumption.

Currently, around 80% of the global production of liquid biofuels is in the form of ethanol. In 2012 global fuel ethanol production reached 86 billion liters, global biodiesel production amounted to 18 million tons, or 20 billion liters (*Figure 4 and Figure 5)*. In 2012 the United States was the world's largest producer of biofuels, followed by Brazil and the European Union. Despite continued increases in production, growth rates for biodiesel slowed again, whereas ethanol production growth picked up new momentum.

4.2.3. Transport policies

The passenger vehicle fleet will double to 1.7 billion in 2035. Common policies include biofuel subsidies, tax exemptions, blending mandates and the introduction of flex-fuel vehicles (FFV) Blending mandates, targets, fuel-tax exemptions and production subsidies exist in around 50 countries. City and local governments around the world continue to enact policies to reduce greenhouse gas emissions and promote renewable energy *(IPCC, 2011).*

To drive development of biofuels that provide considerable emission savings and at the same time are socially and environmentally acceptable, support measures need to be based on the sustainable performance of biofuels. Recent years have also seen increased attention to biofuels sustainability and environmental standards *(Licht, 2013).* Another approach is to directly link financial support to life-cycle CO_2-emission reductions (calculated with a standard life-cycle analysis methodology agreed on internationally) to support those biofuels that perform best in terms of CO_2 savings. Neither specific advanced biofuel quota, nor performance based support measures on their own seem to be effective to address the higher production costs of advanced biofuels in the short term. Specific transitional measures may thus be needed to support the introduction of the new technologies. Financial incentives, for instance a tax incentive or perhaps analogous to feed-in tariffs for electricity, could be coupled to the use of co-products such as waste heat to promote efficient use of by-products.

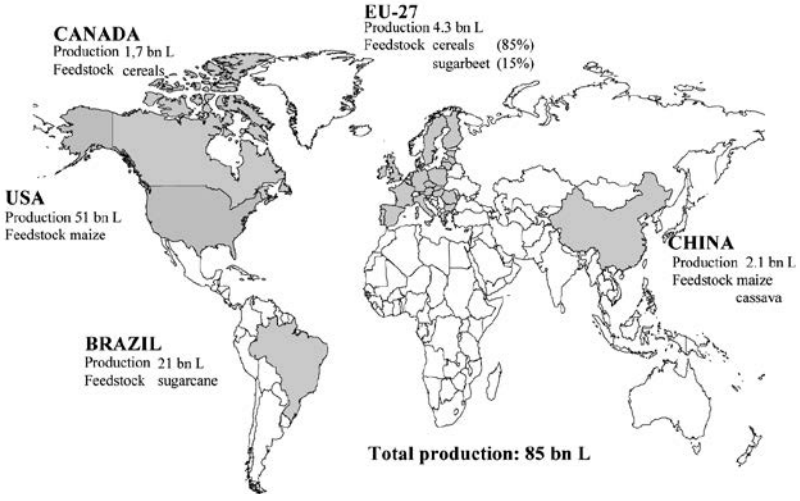

Figure 4: Word fuel ethanol production, 2012.
Source: Licht, 2013

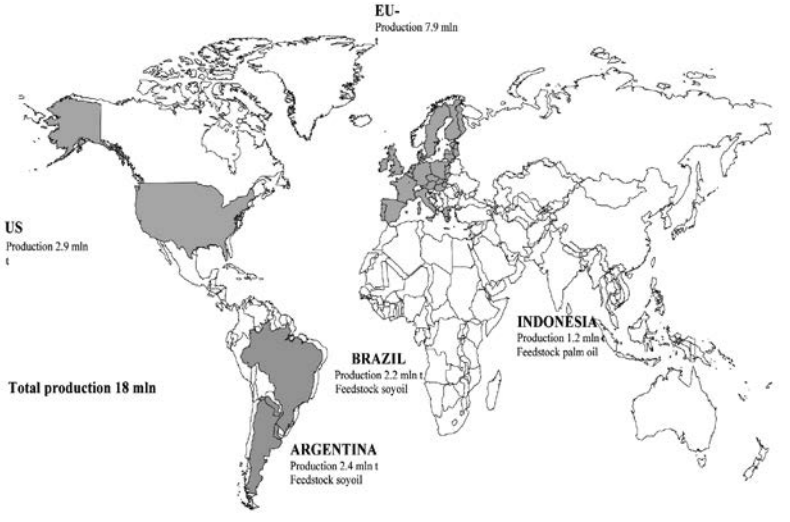

Figure 5: World biodiesel production, 2012.
Source: Licht, 2013

4.3. Risks to the environment

4.3.1. Land use change and GHG emission

About 84% of current CO_2 emissions are energy-related and about 65% of all greenhouse-gas emissions can be attributed to energy supply and energy use. All sectors (buildings, transport, industry and other) will need to reduce dramatically their CO_2 intensity if global CO_2 emissions are to be decreased by 50 to 85% below 2000 levels by 2050. Energy-related carbon-dioxide (CO_2) emissions in 2010 are estimated to have climbed to a record 30.6 Gigatons (Gt) and concentrations have continued to grow to over 390 parts per million (ppm) CO_2 or 39% above pre-industrial levels. The Cancun Agreements call for limiting global average temperature rises to no more than 2 °C above pre-industrial values. In order to be confident of achieving an equilibrium temperature increase of only 2 °C to 2.4 °C, atmospheric GHG concentrations would need to be stabilized in the range of 445 to 490 ppm CO_2 equivalent in the atmosphere. Scientists warn that if the current trend to build high-carbon generating infrastructures continues, the world's carbon budget will be swallowed up by 2017, leaving the planet more vulnerable than ever to the effects of irreversible climate change *(Berndes et al., 2010).*

The transport sector is currently responsible for 23% of energy-related CO_2 emissions. To achieve the projected target of 50% reduction in energy-related CO_2 emissions by 2050 from 2005 levels sustainably produced biofuels production must provide 27% of total transport fuel. Reductions in transport emissions contribute considerably to achieving overall targets. India and China show significant increases because of rapidly growing vehicle fleets. Vehicle efficiency improvements account for one-third of emissions reduction in the transport sector; the use of biofuels is the second-largest contributor, together with electrification of the fleet accounting for 20% (2.1 Gt CO_2-equivalent) of emissions saving *(Berndes et al., 2010).*

Bioenergy's contribution to climate change mitigation needs to reflect a balance between near-term GHG targets and the long-term objective to hold the increase in global temperature below 2 ºC. Bioenergy has significant potential to mitigate GHGs if resources are sustainably developed and efficient technologies are applied. The impacts and performance of biomass production and use are region- and site-specific. Most current bioenergy systems, including liquid biofuels, result in GHG emission reductions, and advanced biofuels could provide higher GHG mitigation. The GHG balance may be affected by land use changes and corresponding emissions and removals.

The role of bioenergy systems in reducing GHG emissions needs to be evaluated by comparison with the energy systems they replace using life-cycle assessment (LCA) methodology. The precise quantification of GHG savings for specific systems is often hampered by lack of reliable data. Furthermore, different methods of quantification lead to variation in estimates of GHG savings. Nonetheless practically all bioenergy systems deliver large GHG savings if they replace fossil-based energy and if the bioenergy production emissions – including those arising due to land use change – are kept low. Currently available values indicate a high GHG mitigation potential of 60–120%[3], similar to the 70–110% mitigation level of sugarcane ethanol and better than most current biofuels *(IEA Bioenergy, 2009).* However, these values do not include the impact of land use change (LUC)[4] that can have considerable negative impact on the lifecycle emissions of advanced biofuels and also negatively impact biodiversity.

Biomass for energy is only one option for land use among others, and markets for bioenergy feedstocks and agricultural commodities are closely linked. Thus, LUC effects which are "indirect" to bioenergy are "direct" effects of changes in agriculture (food, feed), and forestry (fiber, wood products). They can be dealt with only within an overall framework of sustainable land use, and in the context of overall food and fiber policies and respective markets. The direct LUC effects of bioenergy production can, in principle, be controlled through certification systems, wherever biomass is grown. The risks of land-use change and resulting emissions can be minimised by focusing on wastes and residues as feedstock; maximising land-use efficiency by sustainably increasing productivity and intensity and chosing high-yielding feedstocks; using perennial energy crops, particularly on unproductive or low-carbon soils; maximising the efficiency of feedstock use in the conversion processes; cascade utilisation of biomass, i.e. linking industrial and subsequent energetic use of biomass; co-production of energy and food crops.

Changes in land use, principally those associated with deforestation and expansion of agricultural production for food, contribute about 15% of global emissions of GHG. Currently, less than 3% of global agricultural land is used for cultivating biofuel crops and LUC associated with bioenergy represents only around 1% of the total emissions caused by land-use change globally most of which are produced by changes in land use for food and fodder production, or other reasons *(Thrän et al., 2012).* Indirect land-use changes, however, are more difficult to identify and model explicitly in GHG balances. Most current biofuel production systems have significant reductions in GHG emissions relative to the fossil fuels displaced, if no indirect LUC effects are considered.

The bioethanol share in total grains demand in 2010 was 8%. By adding the feed value of ethanol by-product dried distillers's grains and soluable (DDGS), the net shares decline by one third to slightly above 5%. The fuel ethanol sector, mainly in the US, accounted for 16% (net 11%) of global corn consumption and 20% of global sugar cane production. The biodiesel share in rapeseed, soybean and palm oil demand was around 10% of global vegetable oil production. The share of waste biodiesel feedstocks such as animal fat and used

[3] An improvement higher than 100% is possible because of the benefits of co-products (notably power and heat).

[4] Two types of land use change (LUC) exist: direct LUC occurs when biofuel feedstocks replace native forest for example; indirect LUC (iLUC) occurs when biofuel feedstocks replace other crops that are then grown on land with high carbon stocks.

cooking oil increased to 15% in total biodiesel output in 2010 (*Licht, 2013*).

In 2010 about 20 million gross hectares of grains, sugar cane and cassava for fuel ethanol production and 20 million gross hectares of oilseed feedstock was needed for biodiesel production (*Thrän et al., 2012*). The proportion of global cropland used for biofuels is currently some 2.5% with wide differences among countries and regions. The biofuel production processes give rise to by-products which are largely suitable as animal feed. By-products are supposed to be credited with the area of cropland required to produce the amount of feed they substitute. In the cases of grains and oilseeds, DDGS (dried distillers grains with solubles) and CGF/CGM (corn gluten feed/meal) and oil cakes (mainly rapeseed and soybean cake/meal) substitute grain and soybean as feed. It means that not all the grains used for ethanol production should be subtracted from the supplies since some 35% is returned to the feed sector in the form of by-products (mainly DDGS) so the land required for feedstock production declines to 15 million hectares. In case of biodiesel production 50-60% of rapeseed (rapeseed cake/meal) and 80% of soybean (soybean meal) is returned to the feed sector and the net land requirement decrease to around 6 million hectares. By adding by-products substituted for corn and soybean meal the net hectares needed for fuel ethanol decline to 21 million (authors' calculation). By adding by-products substituted for grains and oilseeds the land required for cultivation of feedstocks declines to 1.5% of the global crop area (net land requirement).

Based on the land-use efficiencies land use for biofuel production would need to increase from 40 million hectares (21 million hectares net land requirement by adding by-products substituted for grains and oilseeds) to around 100 million hectares in 2050. This corresponds to an increase from 2.5% of total arable land today to around 6% in 2050. This expansion would include some cropland, as well as pastures and currently unused land, the latter in particular for production of lignocellulosic biomass (*IEA, 2010*).

4.3.2. Sustainability criteria for bioenergy

Many efforts are under way to develop sustainability criteria and standards that aim to provide assurance about overall sustainability of biofuels. International initiatives include the Global Bioenergy Partnership, the Roundtable on Sustainable Biofuels, the International Organization for Standardization and the International Sustainability and Carbon Certification System. There are also initiatives looking at standards for the sustainable production of specific agricultural products, such as the Roundtable for Sustainable Palm Oil, the Roundtable for Responsible Soy and the Better Sugarcane Initiative. Development of standards or criteria will push bioenergy production to lower emissions and higher efficiency than today's systems. The standards aim at ensuring sustainable production of feedstocks, regardless of their final uses (be it for food, material or biofuel production), and can thus help to ensure sustainable production throughout the whole sector, rather than for the feedstock specifically dedicated to biofuel production. Some policies have been adopted during recent years that include binding sustainability standards for biofuels.

Some of the GHG emissions principles require process improvement over time, while others require a specific target to be achieved. Some schemes require higher emission treshholds over time. The EU is the global frontrunner on sustainability, other continents may follow. The EU has introduced regulations under the RED (Renewable Energy Directive) that lay down sustainability criteria that biofuels must meet before being eligible to contribute to the binding national targets that each Member State must attain by 2020 (*Official Journal of the European Union, 2009*). In order to count towards the RED target, biofuels must provide 35% GHG emissions saving compared to fossil fuels. This threshold will rise to 50% as of 2017, and to 60% as of 2018 for new plants. However, there is a loophole as only direct LUC emission is accounted and indirect LUC emission is not calculated. The difficulty is that indirect LUC cannot be observed or measured.

The RED promotes advanced biofuels (biofuels from lignocellulose, algae, wastes and residues), by counting their contribution twice towards the 2020 target. Each Member State has adopted a certification system but there is no EU-wide alignment. As a consequence most of the Member States have not yet (fully) transposed the RED, e.g. double counting mechanism or defining highly bio-diverse grasslands. Harmonised definitions of waste, residues and highly bio-diverse grasslands are needed to avoid market distortion and make the voluntary sustainability schemes work. The full and harmonized transposition of the RED by the Member States is important for the future development of the industry. Critical issues around the double counting mechanism and indirect LUC need also to be resolved in a timely manner.

In the United States, the Environmental Protection Agency (EPA) is responsible for the Renewable Fuel Standard program. This establishes specific annual volume requirements for renewable fuels, which rise to 36 billion gallons by 2022. These regulatory requirements apply to domestic and foreign producers and importers of renewable fuel used in the US. Advanced biofuels and cellulosic biofuels must demonstrate that they meet minimum GHG reduction standards of 50% and 60% respectively, based on a life-cycle assessment (including indirect land-use change) in comparison with the petroleum fuels they displace. In 2010, the EPA designated Brazilian sugarcane ethanol as an advanced biofuel due to its 61% reduction of total life cycle greenhouse gas emissions, including direct indirect land use change emissions. In Switzerland the Federal Act on Mineral Oil mandates a 40% GHG reduction of biofuels in order to qualify for tax benefits.

Sustainability criteria and biomass and biofuels certification have been developed in increasing numbers in recent years as voluntary or mandatory systems; such criteria, so far, do not apply to conventional fossil fuels. The registered several dozens of initiatives worldwide to develop and implement sustainability frameworks and certification systems for bioenergy and biofuels, as well as agriculture and forestry, can lead to a fragmentation of efforts. A proliferation of standards increases the potential for confusion, inefficiencies in the

market and abuses such as "shopping" for standards that meet particular criteria. There is a risk that different and partially incompatible systems will create trade barriers. Lack of international systems may cause market distortions (*van Dam et al., 2010*). Production of "uncertified" biofuel feedstocks will continue and enter other markets in countries with lower standards or for non-biofuel applications that may not have the same standards.

5. Conclusion

The increased population density, coupled with changes in dietary habits in developing countries towards high quality food is projected to increase demand for food production by 60% by 2050. In addititon unprecedented development is taking place, especially in areas that have traditionally had very low per capita demand on fossil resources. The need to increase agricultural productivity and efficiency in developed as well as in developing countries is now widely accepted. Producing more food sustainably requires crops that make better use of limited resources including land, water and fertiliser. With increasing demands of energy it has become apparent that the continued emissions of greenhouse gases and loss of carbon sinks are influencing the world climate.

The main strategy proposed to ameliorate the effects of climate change is to reduce global demand for fossil fuel resources. A constant and renewable supply of energy that has a low carbon cost is required. The contribution of bioenergy to improving energy security largely depends on decoupling the bioenergy system from oil and gas inputs. In many countries, stronger climate change and environmental directives have become an impetus for the accelerated development of renewable energy supply. But the recent expansion of the bioenergy industries together with a strong increase in many commodity prices has raised concerns over the land use choices between energy needs and food and feed.

The worldwide potential of bioenergy is limited, because all land is multi-functional and land is also needed for food, feed, timber and fiber production, and for nature conservation and climate protection. In addition, the use of biomass as an industrial feedstock (e. g. plastics) will become increasingly important. As future yield increases are uncertain the highest priority should be given to the use of organic waste, harvest wastes and residues, since the associated risks are minimal, because it does not require any new agricultural land. If, however, energy crops are cultivated, they should where possible be grown on previously unused, degraded land. This promotes nature conservation and climate change mitigation and helps prevent risks to food security. Availability for non-food crops will be determined by increased yield potential, reducing losses and wastes and lower inputs. In addition, competition for the best use of biomass (materials, chemicals, energy) has also to be taken into consideration. How will biomass resources be allocated depends on costs associated with biomass storage, transportation, and economic and environmental consideration. Biorefineries can make a significant contribution to sustainable development by adding value to the sustainable use of biomass. They can produce a spectrum of bio-based products (food, feed, materials, biochemicals) and bioenergy (fuels, power and/or heat) feeding the full bio-based economy.

The international bioenergy market is expected to have a wide range of suppliers from several world regions and the importation of bioenergy is therefore not affected by the same geopolitical concerns as are oil and natural gas. The use of bioenergy resources and biomass trade would generally contribute to the diversification of the energy mix. A regime for the growing trade of solid biomass (pellets, chips) and liquid biofuel is needed with the adoption of sustainability criteria in the international arena. A trend toward harmonisation of standards and certificates can be expected to continue in the future, however, the number of standards is continuously changing to take in to account the scientific advancaments in the design and production of new materials and ever changing applications.

The increasing demand for suitable land in which this biomass needs to grow competes with the need for food production. This is causing conflicts between land use for food and those for producing bioenergy crops. These problems will be amplified by the change in land productivity caused by climate change (erosion, water stress, increasing soil salinity, and others more). Policies for promoting biomass as an alternative energy source will need to take these potential land use conflicts into account. The global potential for biomass energy production is large in absolute terms, but it is far not enough to replace the current energy usage. Increasing biomass energy production beyond a certain level would have significant effects on land use and conventional agricultural markets. Conflicts resulting from limited land need to be solved by R&D support and efficient regulation on an international level if biomass is supposed to increase its share of the energy mix.

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COGNITIVE DIMENSIONS OF SUBJECTIVE QUALITY OF LIFE IN HAJDÚ-BIHAR COUNTY

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Abstract: The objective of the present study is an investigation of the objective and subjective factors of life quality. Researchers and political leaders show increasing interest in the question: on what grounds do people judge their quality of life, what satisfies or makes them happy? Do we subconsciously make some kinds of mathematical calculations weighing our results achieved in certain areas of life to assess how we are getting on? Or rather we use one "indicator" (e.g. money, number of friends, professional recognition) and we assess our situation accordingly? These issues necessarily emerge when it comes to the consideration of the quality of life.
Among factors determining life satisfaction, earnings, employment, health and relationships play significant roles. Therefore, on the leading edge of this research are primarily the cognitive factors of life quality, i.e. external factors influencing satisfaction.
The present study also seeks to identify the role of health tourism in the assessment of the quality of life. Questionnaires were completed in one of the most popular tourist destinations of Hajdú-Bihar County. The 805 local respondents expressed their views primarily about factors determining their well-being and about the impacts of the dominant presence of health tourism on their lives.

Keywords: quality of life, health tourism, cognitive satisfaction, life satisfaction

1. Introduction

One remarkable characteristic of present day consumer society is that we seek to satisfy our needs through purchasing a higher amount of goods and services than indispensable for our subsistence.

Consumption has become part of our identity, it is a source of everyday happiness and in certain cases, that of self-realization. While the characteristics of consumption evidently exert influences on individuals' quality of life, craving for the standardisation of the latter has been equal in age with thoughts about the meaning of human life. If prerequisites of quality lifestyle were precisely identified, this definition would provide the potentials of optimal everyday life for individuals and communities. However, there is a common understanding that human life is much more complex. One thing is sure: the quality of life is the alpha and omega of survival for humans. The knowledge of the symbiosis of specific elements constructing the quality of life provides us with potentials to ensure its required level more successfully.

2. Materials and methods

The study presents the partial results of a great research activity. Analysis on some factors influencing the quality of life was performed by evaluating questionnaires completed in Hajdúszoboszló. The study was premised on primary and secondary research. Primary research included the analysis of technical literature closely related to the topic and earlier studies prepared about Hajdúszoboszló.

Primary research was conducted in the form of a questionnaire survey, 805 pieces of questionnaires were filled in by local inhabitants in October 2011-February 2012. The questionnaires were analyzed by the Statistical Package for Social Science (SPSS) program.

3. Results and discussions

3.1. General satisfaction, future prospects

With respect to actual economic and labour market conditions in the country, the majority of respondents were unable to voice positive feelings about their own lives. 58% of Hungarians claimed in the autumn of 2009 that they were not satisfied with their lives. The rate of pessimistic people increased by 2% as compared to a previous survey 6 month earlier; at the same time the rate of Hungarians pronouncedly satisfied with their lives dropped to 42%.

In international comparative terms, merely Bulgaria precedes Hungary on the list of dissatisfaction, where the rate of those who are satisfied with their lives is only 38%. The highest rate of those who feel well is represented by people of 15–24 (67%). The least satisfied category is the age group of 40–54 with 70% of those who find their present conditions far from being ideal.

The rate of satisfied people in Hungary lags well behind the values measured by Eurobarometer (78%) in all the EU member states. Inhabitants mostly exhibit a positive attitude in Denmark (98%), Luxemburg (96%), Sweden (96%), The Netherlands (95%), Finland (95%) and the United Kingdom (91%). Interestingly in Greece, where 56% of respondents were pessimistic in the spring of 2009, this number dropped to 42% in 6 months whereas the rate of satisfied people increased from 44% to 58% (*Eurobarometer 72, 2009*).

3.2. The cognitive dimension of subjective quality of life

There are subjective and objective sides in life quality researches. The two significant life quality research models are the Scandinavian, starting with the availability of resources and their possession, therefore laying emphasis on objective factors; and the American, which rather finds subjective perception and evaluation important. A kind of mixture of these two is the life quality approach by Erik Allart. Following Maslow's model, he also created a hierarchy of needs and distinguished 3 levels:

„Having, loving, being" (material–environmental and social needs and needs for personal development as well). Moreover, he differentiated objective factors and the related subjective attitudes on all the three levels. In the present study the level of "having" is the most relevant, so objective and subjective indicators will be highlighted at this level:

- Objective: objective measurement of the standard of living and environmental conditions
- Subjective: contentment with the standard of living, the feeling of contentment (*Utasi, 2007*)

In the analysis of life standard and living conditions, objective indicators include primarily earnings, labour-market status, the availability of consumer goods and other similar material indicators. In general, GDP per capita and various indices, mainly those formed from national economic indicators may also be analysed.

In the last fifty years, there has been a concerted effort to empirically investigate SWB, from its correlations *(Seidlitz and Diener 1993; Oishi et al. 2007*), to forecasting affect *(Gilbert, 2006*) to cross-cultural differences (*Scollon et al., 2005*). Yet, only a few have attempted to search for a unifying theory of subjective well-being (*Brief et al., 1993; Feist et al. 1995; Kim-Prieto et al. 2005)*.As an alternative to utility, subjective well-being (SWB) has been proposed as a measure of individuals' benefits in a number of domains (*Kahneman, 1999*). SWB expresses individuals' cognitive and emotional well-being, directly measured by means of reliable psychometric scales (*Diener and Suh, 1997*). Since SWB refers to satisfaction with life in general, it is assumed to be relatively stable across time and to go beyond, but implicitly include, domains such as family life, work life, and leisure. Yet, there is an increasing interest in understanding how SWB depends on context-specific factors such as, for instance, various forms of consumption, improved schools, or reduced commuting stress *(Diener and Seligman, 2004; Diener et al., 2009).*

The quality of life is a joint dimension of objective factors determining human life and their subjective reflections *(Michalkó, 2010).* Whereas welfare refers to the objective factors (earnings, health, infrastructure, public security) of the quality of life *(Figure 2.),* well-being relates to subjective ones (delight, appreciation, affection). The relation of earnings and health has been widely investigated. Research findings reveal that higher incomes lead to better health, but better health may also result in higher incomes due to increased labour productivity and more active participation in the labour market. Similarly positive, two-directional relations can be detected in the relation of education and incomes. Education enhances social participation which is a significant component of the quality of life (QOL). Those people whose level of education is higher feel less helpless and they are less likely to be taken advantages of or manipulated negatively through their decisions *(Putnam, 1993).*

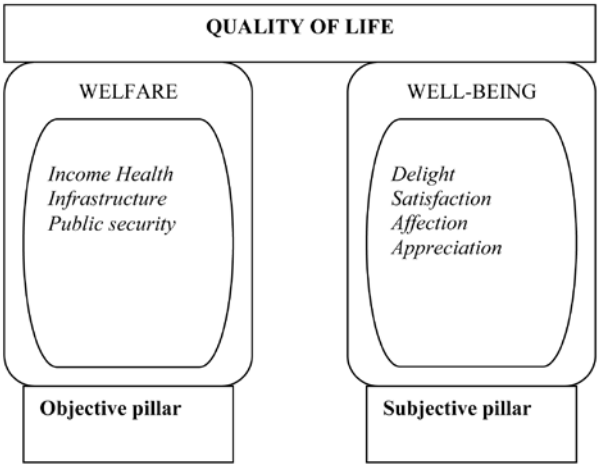

Figure 1: Pillars of the quality of life
Source: Authors' own work based on Michalkó (2010)

3.3. Evaluation of results

Significant features in the sample

The following table *(Table 1.)* shows the summary of some basic features in the sample. In terms of representativity, it is significant for the sample to reflect the distribution of the major characteristics in the population. Therefore, the sample included approximately 50–50% of women and men. The majority of respondents represented the age group of 20-60 (60%). Most of the people in the survey (51.2%) received average monthly earnings of 50 000–10 000HUF per capita.

Focus on health

Health is the condition of full physical-mental and social welfare, not merely the lack of illnesses or disabilities. The highest possible level of physical and mental health is one of basic human rights.

It determines individuals' lives and their quality of life as much as the income generating capacity of a society, so the improvement of the preservation and efficiency of health requires existing and available information which has been regarded highly significant recently *(Statisztikai tükör, 2010).*

Part of health-related information is exclusively acquired through a questionnaire survey on population health, because data recorded by health institutions fail to reflect a picture of – among others – lifestyle and social factors influencing health, health expenditures and satisfaction with the health care system.

People's increasingly deteriorating health seems to be the outcome of lifestyle affecting features, technical wonders and achievements in today's civilised world. Our modern "sitting" lifestyle poses severe health problems which are to be addressed. The idea emerges more and more frequently that sports should play a vital role in life, should become a basic element of life. These days scores of people come to the realization that prices are not only to be paid for available worldly goods. The highest price is paid for health and its preservation is even more costly.

Table 1: Distribution of the sample in terms of age group, gender, school qualification, marital status and average monthly earnings

	Person	%
In terms of gender		
Man	419	52.4
Woman	381	47.6
In terms of age		
20 years or below	134	16.8
21-40 years	250	31.3
41-60 years	233	29.1
above 61 years	183	22.9
In terms of marital status		
Single	199	24.9
Married	402	50.3
Registered partners	94	11.8
Widow/widower	65	8.1
Divorced	40	5.0

Source: Authors' own work

As *Figure 2.* shows, pursuit of a healthier lifestyle has already begun in Hajdúszoboszló, but the rate of people who do not go in for sports or only very rarely is still high (46.4%). However, this result can be regarded good as compared to previous surveys, i.e. the fact the 19.8% of respondents do sports on a daily basis is a positive development and it massively contributes to improving the quality of life.

We can only realize ourselves and live our lives to the fullest if we are healthy.

This statement is primarily underpinned by the examination of health conditions and satisfaction.

Figure 3. demonstrates that 12% of people were satisfied and 24% were rather satisfied with their lives of those respondents who did not suffer from illnesses at the interview date.

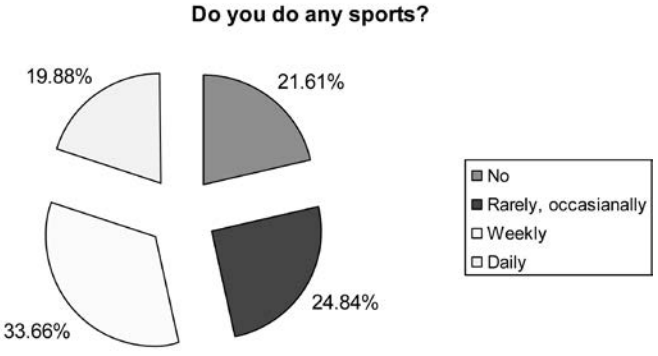

Figure 2: Examination on the frequency of physical exercises
Source: Authors' own work

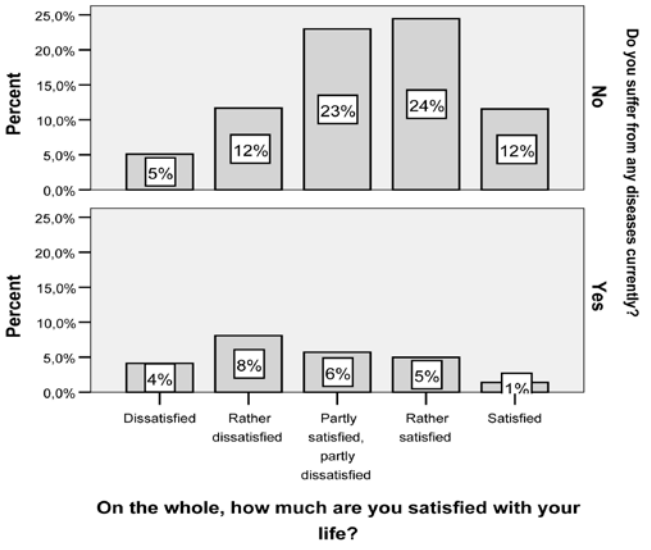

Figure 3: Correlation of health condition and satisfaction
Source: Authors' own work

Reverse tendencies emerge in the structure of local society regarding traditional agricultural workers and those working in tourism. Agricultural workers feel that they are provided with fewer opportunities and they are not involved in developments. However, the value of their lands and estates might multiply with the development of tourism and this is definitely their advantage. Tourism indirectly provides them with opportunities: they can sell their products locally, as this has been proved by several examples in towns and neighbouring villages. The development of infrastructure, the relative abundance of services and their children's access to employment is their benefit as well. The contrast can be apparently traced back to the lifestyle and mentality of workers in the two different economic sectors.

The creation of welfare and financial stability is a vital issue in our days. Naturally the slogan is well-known: money cannot buy happiness. Unfortunately, it is not quite true. It may not buy happiness after reaching a certain level, earnings of millions will not increase individual satisfaction, but proper income is needed to live our lives to the fullest. Money is not only essential to satisfy our everyday needs but it is also instrumental to obtain other elements included in the quality of life.

We wish to keep relationships with our friends and relatives in vain if we do not possess the necessary amount of money to go out somewhere for a glass of drink or to invite them to our homes or if our mind is continuously obsessed with our financial safety instead of enthusiastic conversation.

Figure 4. represents this statement as those who live above subsistence level and live from more than 100 000HUF average earnings per capita are more satisfied with their lives (10. 68%).

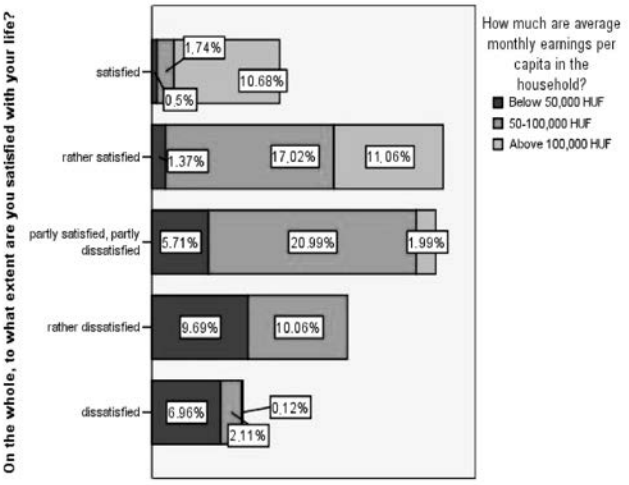

Figure 4: Correlation of life satisfaction and earnings
Source: Authors' own work

4. Conclusions and recommendations

The survey conclusions have confirmed the findings of previous research activities and unveiled several new correlations as well.

More noteworthy is that for Hajdúszoboszló it is a strategic advantage to highlight health in its product range and also the town's endowments are favourable for developing family-friendly offers. The above mentioned do not only improve the life quality of tourists in the region but also the health condition of the local population.

As decades pass in human life, we face an increasing number of health problems in both sexes. Elderly people need to lay a special emphasis on their health, daily movement and the selection of suitable, occasionally special type of movement is extremely significant for them.

Through physically active, sporty lifestyle, positive view of life several problems and diseases can be prevented and the risk of developing certain illnesses can be cut back. With respect to the examination of lifestyle it is very important that 19.8% of respondents do exercises on a daily basis and 33.6% on a weekly basis.

The other impact of tourism on the quality of life is that it inspires inflation. The touristic reputation of the town increases prices by about 15–20% than in Debrecen or in other neighbouring cities or settlements. This definitely poses problems for local inhabitants, as 52% of respondent live on an average of 50–100 000 monthly earnings but who live above subsistence level and live from more than 100 000HUF average earnings per capita are more satisfied with their lives.

Several research findings on bathing areas in various Hungarian regions have proved that visiting baths is an integral part of everyday programs: their extended product range has the potentials for regular physical training, the combination of personal care and relaxation and the preservation of health. Therefore, thermal baths are locations for the preservation of physical-mental, social well-being and health. Regular bath visitors also require customary free time and wellness services in good quality and this demand is to be met in the product development of baths as touristic destinations (*Müller-Kórik 2009, Müller et. al 2009, Kerényi et. al 2009, Mosonyi et. al 2010).* It offers a complementary theoretical framework of how travel choice outcomes are experienced, and what factors influence global affective and cognitive SWB. For instance, the notion that affect plays an important role for SWB suggests that soft factors should receive more attention. Likewise, the fact that SWB is associated with achievement of life goals suggests that the opportunity to engage in activities is an important factor determining SWB.

Health tourism is a part of the tourist trade with a higher-than-average revenue generating potential.

It is especially significant in rural settlements and regions where agriculture cannot provide inhabitants with satisfactory sources of income. Especially imperative is that tourism has the potential to surge enterprise activities, regional development and to enhance innovation, which makes it a visible actor in economy *(Puczkó-Rátz, 1998).*

Tourism is instrumental in reviving and preserving traditions and customs, enriches the range of cultural offers and may develop positive pride in people. Evidently, these factors are suitable to judge our quality of life more positively and feel more satisfaction.

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CIVIC ORGANIZATIONS AND CITIZENS-AN ALTERNATIVE APPROACH TO UNDERSTANDING CIVIC ENGAGEMENT

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Abstract: The importance of nonprofit, and inside classic civic sector is usually approached on the basis of figures of the Statistical Office. Based on these, we may assume these to have a slight or intermediate role in the greater economy regarding economic capacity and human resources. Actually, we cannot have a closer look into local conditions and circumstances which would contribute to a better understanding of how civic organizations are connected to citizens. It is difficult to estimate the background, effect, personal movements behind the civic sector; international literature discusses this issue in the framework of civic engagement. In a private examination, I may also contribute to the alternative approach to the importance of the civic organization sector by studying and measuring the complex indicator termed "civic involvement". Additionally, a small scale pilot examination has revealed a better, more precise description of the connection between citizens and civic organizations, which may also enable the better planning of local municipal interventions.

Keywords: civic organizations, civic engagement, survey, rural society

Introduction

Professional literature (such as Brint-Levy 1999), Cnaan-Milofsky 2007) often discusses and analyzes the connection between nonprofit organizations and citizens, and this special subject is often termed "civic engagement". Unger (2005: 19) claims that "we hardly find a universal, widely accepted term for civic organizations, since a kind of pluralism may be experienced of that. Still, they definitely are formal interest validating leverages of the civic society".

This term is related to civic activity connected to civic movements and organizations. Civic engagement means that citizens work together for the common good and social capital is a connection system based on samples of relatively enforced trust, by which citizens and institution may access such special resources as social services, volunteers and donations. Social capital and civic engagement may be differentiated on the level of analysis; still both have mutual central elements, such as trust, human relations, common norms, values and cultural attributes. The term civic relates to the activity of citizens, and by engagement is meant active contributions.

Civic engagement relates to how citizens participate in civic social institutions, such as nonprofit organizations, so that they might contribute to meeting social objectives. This participation is made using a social mechanism, i.e. organizations, which serve the aims of common wealth (Cnaan-Milofsky 2007). Despite the growing numbers of civic organizations which appeared after the change of regime in Hungary, the real level of civic engagement is still comparatively low in Hungary, compared to EU figures. Cartwright et al. (2008) has revealed that 34% of the citizens of EU 25 countries are interested in active participation or voluntary work. While in neighboring Austria, they have the highest EU level (60%) of such activity, we lag behind most of EU countries with a dismal 17%-according to a survey accessed in 2006[1]. Most Europeans do not actively participate or do voluntary work, at least not in or for any of the organizations listed in their questionnaire (64%). The most typical forms of participation are sport or leisure activities. This paper suggests that engagement primarily means employees and volunteers. Other listed indicators are the ratio of making donations, interventions in risky situations for the interest of others and also the frequency of meeting family members, also friends. It also seems that the level of civic engagement decreases with the levels of graduation and status (for example it is the highest for the managers). Bácsné (2012) emphasized based on prime examinations in the field of time management that this layer seems to be more sensitive regarding the importance of social capital in environmental changes. It is more than obvious that numerous indicators

[1]There are diverse approaches to accessing the level of civic engagement by different organizations. This data is based on the report of European Social Reality. See further information on http://ec.europa.eu/public_opinion/archives/ebs/ebs_273_en.pdf

are covered by the term of civic engagement (more than the number of members, employees, volunteers and economic capacity, which are the most frequently referred indicators nationally describing the importance of the civic sector), but there are some other, still debated issues on this subject. One of the most comprehensive latest descriptions (Gerő 2012) deals with measuring the importance of the civic sector. It reveals that several surveys (such as European Values Survey, European Social Survey, the International Social Survey programme) aim to access to most accurate data. Still, figures from these do not originate from the same questions, and these statistics may only be understood "carefully, controlled by each other". Referred indicators are the number of members, active members and leaders of civic organizations, participation in activities and events, frequency of civic engagement, the number of civic organizations, details of volunteerism (which varies considerably by research study), the intensity of participation, action-like participation, donation and donation of 1% of the income tax[2]. The real problem is the "latest" nature of the figures, the difficulty in comparison, the simplification of a complex issue, and these figures may not properly contribute to understanding the real importance of the sector, cannot be transformed into a whole system, and cannot answer local, even country level questions of the territorial development (such as why a municipality should support a civic organization, the importance of which locally cannot be estimated). The real question is whether a connection between civic organization and citizens may be measured at all? As a whole, there is no wide acceptance regarding the depths of these contributions, and diverse approaches mainly focus on specific natures, without describing a whole picture of how this relationship really is.

When we discuss the subject of civic organizations, the term does not mean the same for all of us. Regarding the term of nonprofit, it is obviously meaningful, still there is difference between nonprofit and civic organizations. According to Geszti (n.d) "*The label of civic organization is not obvious, since it is in relationship with diverse contents by countries. We often regard as the third sector, by differentiating it from the governmental and business sector. The most experienceable term is the nonprofit category*".

There was a bit of confusion up to 2011 regarding the sphere of civic organizations in Hungary, as it was defined it an earlier manuscript[3] . "*Today we may identify the association (and its some specific forms, such as the alliance), the private foundations and the civic society as civic organizations. The understanding of the new legislation[4] explains that association cumulates the social capital of the members, the foundation integrates the financial possibilities of the members and the founder, the civic society is a less legal form of an association with fewer obligations and cannot accept state support, which is a major characteristics opposite with the others*".

Table 1: **Basic types of civic organizations**

Nonprofit organizations			
Civic organizations by the new Act			*Other nonprofits*
Classic civil organizations		**Civil society**	
Associations	Foundations		

Source: Private examinations, 2013.

There were 65.5 thousand nonprofit organizations in Hungary in 2011[5], one third (23.2 thousands) in the form of foundations, and another 42.3 thousand as associations. These two forms are also referred to as classic civic organizations.

Of the 65.5 thousand nonprofit organizations, almost 90% may be considered to be classic civic organizations, meaning that the sphere – regarding number of organizations – is determined by the classics. When this figure is compared to the data of previous years', we notice that there is one civic organization for every ten for-profit organizations. Official statistics describe a more positive picture of the nonprofit sphere, while this picture does not seem to be favorable for the classics. The distribution of revenues is not equal, the sphere is considerably polarized[6]. Regarding all nonprofits, 57% of incomes come from support, of which 42% is state support. Vántus-Oláh (2012: 184) confirmed that supports played a vital role in the life of for profit organizations, so a similar tendency seems to be valid for nonprofit organizations, as well. Although we may note a considerable large number of employees for nonprofits, of which classics possess only a small fragment. Totally, we see a human capacity of 52 thousand full time employees (calculated by including the working hours of employees and volunteers), which means only one full time workforce per organization. This simplification may be exaggerated, but large inequalities are behind this figure). .

When we try to describe the importance of these almost 60 thousand classics, official statistics may only reveal economic and financial possibilities by averages: the number of members, employers, volunteers, working hours, and balance sheet like revenues and expenditures, on the one hand.

On the other hand, civic organizations quite frequently do not purely serve the interests of members, volunteers and employees, but the quite frequently referred common wealth and are means of the also quite frequently referred social (and corporate) responsibility. Their activity may (and definitely

[2]This latest may be a speciality of the national system, partially directly and partially indirectly providing financial resources for civic organizations.

[3]Civic organizations-an approach of diverse understandings (by Troy B. Wiwczaroski - György Norbert Szabados – Anita Pierog (2013). Published in the scientific conference „Taylor után 101 évvel", Szeged, Hungary.

[4]In the end of 2011, a new Act on Civic Organizations and related legislation were introduced. It has defined the term of civic organizations, introduced a new form, changed the financial promotive and control system.

[5]The Hungarian Statistical Office yearly publishes most important figures of the nonprofit sphere. For the latest statistics see: http://www.ksh.hu/apps/shop.kiadvany?p_kiadvany_id=13287&p_temakor_kod=KSH&p_session_id=471427495347132&p_lang=HU

[6]The ratio of those with revenues less than 5 million Fts is about 80,9%, 4,3% with more than 50 millió Fts revenues possess 83,8% of revenues of the sphere. For further information see http://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_qpg006.html

) contribute to the clearer environment, a better education system, a healthy life, better international connection, or even the maintenance of culture, which are really hard to be estimated by the statistics. This means that civic organizations serve the interest of the larger social base (also democracy) and may mostly work on improving life conditions. Actually, we rarely find an estimation on these kinds of effects and the relationship between civic organizations and citizens.

Civic engagement – civic involvement

This subject leads us to a specific area, the observation of which directed me to the adaptation of involvement. Kovách (2005), studying the importance of agriculture after the change of regime, declared that the level of employees has fallen to a relatively low level, still, a large number of the national population still remained, although in a different level, agriculturally involved, which means they still have relationship with the agriculture. His examinations has revealed that agricultural involvement may be accessed differently (some for example are employed in the agricultural sphere, others have infield, some have agricultural degree or just produce agricultural products for sale or self-consumption). By defining diverse categories, he published that the role of agriculture is still not insignificant: "In *2005, 51.6% of the adult population has been directly agriculturally engaged"*

Regarding civic organizations, it seems obvious that some local organizations do not purely mean some 10 members,[7] volunteers or employees, their importance may not be simplified this way, and it does explain their real local importance. They may operate local "telehouses[8]", provide free services, organize village fairs/days, cut ragweed, clean sidewalks, which are not externalities since their founding objectives are in connection with these activities and these do not purely serve the interests of members, volunteers, employees. A special phenomenon of the past 10 years is the cooperation between governmental institutions and civic organizations, aiming to support the poor and the unemployed in the labor market. Such assistance is typical of western European countries, and appeared in Hungary from the beginning of 2000 through various applications (Móré 2012). Civic involvement, inside civic engagement, may illustrate a diverse and a more practical picture of the effect of the classics and their relationship and connection with local citizens and may also reform our thinking on the operation and activity of them.

It is also interesting that a vital variable (supporting the labor-related conditions and supporting the human livelihood and financial prosperity) is not emphasized in the statistical classification. Ibrahim-Hulme (2010) regarded that there is a growing emphasis and attention on decreasing poverty and privation, and the question arises why civic organizations are primarily involved in gender or environmental issues instead of aiming to decrease poverty directly? These kinds of organizations should play a vital role in promoting these kinds of issues and contribute to sustainable decrease of poverty.

Involvement may be approached from two aspects. First, citizens have their points of view on these issues, so their opinions and relationships may be accessed. On the other hand, civic organizations may also have a kind of estimates on these issues, since they can also experience the effect of their operation: the relationship with people and its depths. It also has practical issues, since it may reveal a more precise picture and may also justify locally the financial promotion of classics (such as, for example, that it is true that we only have 10 members (employees and volunteers), but almost 80% of local population are affected by our activity, since we organize free blood pressure checks, cut ragweed)

Research of the civic organization sphere still cannot be closed. There are some specific areas which still require much to be revealed, since some organizations strongly represent their (or their further background's) interest by preventing the force-feeding of geese, protesting against military radio towers or taking actions against establishing a factory or some nuclear waste facility. The background and underlying human or other capacities are quite often hard to estimate, and the question arises whose interests are represented really: only some members, others or a complex human network. It is also debated how efficiently they can take institutional tasks and realize objectives, for example in the field of public employment or such further challenges, such as the compulsory nonprofit practice of high school graduates. There are also some approaches, mainly by business organizations, that civic organizations may exceed their limits and may also cause serious damage as compared to the benefits, their real human background is slighter than it appears and require a more thorough and strict governmental regulation.

Method and material

In the framework of a research program, I tried to validate my assumptions on a pilot examination. The subject of the pilot was a small settlement of the Sárrét Micro region of Hajdú-Bihar County. This village is situated relatively far from even the minor cities, approximately 50 kms away from Debrecen, which means a peripheral location. It had largest population in the XIX. Century, and has been continuously decreasing since then. The latest statistics illustrated approximately 200 inhabitants locally (informally this number is lower). Visiting the village, typical rural conditions and symptoms are revealed: in such a place almost everyone knows each other, human relations are assumed to be more intimate and direct.

Regarding data collection, I have applied a systematic random sampling method[9]. *I could use the list of local inhabitants, of which half of the population, hundred people was included in the survey. This survey was carried out by*

[7]Founding an association in Hungary requires at least ten people, the same for a foundation may be fewer.

[8]These are local community points for citizens.

[9]Two research studiess have been made parallely, since my collegue, Anita Pierog, has collected data on economic engagement.

prepared survey attendants. The confidence interval on 95% reliability level is about 10%, which suggests a more careful approach to the consequences. Parallel to provide triangulation, I have tried to reveal the opinion of managers of the two local operating civic organizations, by making targeted interviews (still focusing the original variables). By contrasting the two approaches, we may gain a better picture of civic organizational involvement of the inhabitants. Of the total results, I will only cover the most significant details.

It seems interesting to examine how local inhabitants are connected to the activity of civic organizations and some kind of benefits, such as improving the life and society through civic organizations. Survey results illustrate quite an uncertain picture *(Figure 1).*

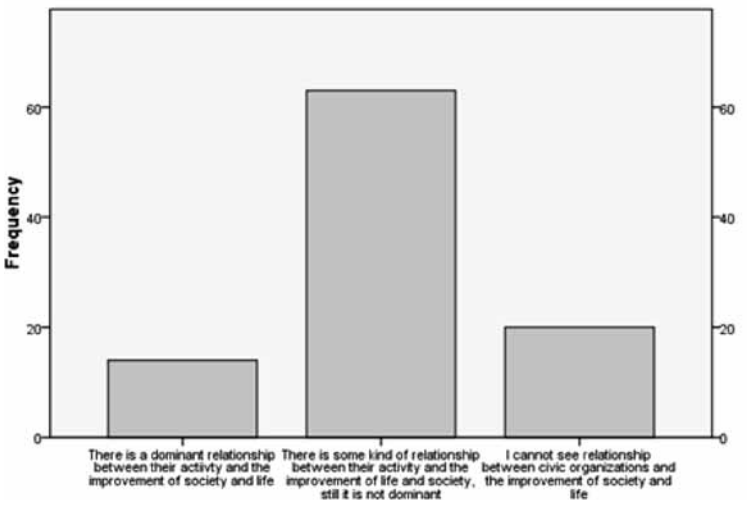

Figure 1: The opinion on the positive influence of civic organizations
Source: Private examination, 2013.

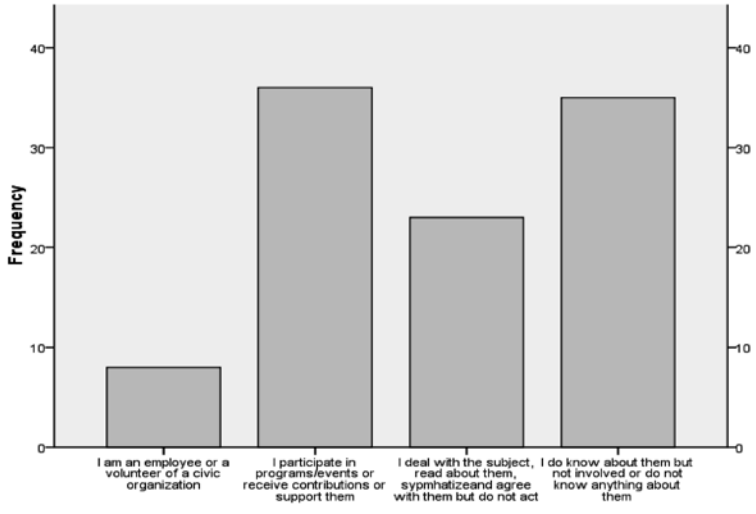

Figure 2: The distribution of involvement depths
Source: Private examinations, 2013.

Opinions of majority of local populations refer to a mostly uncertain condition (63) and an additional (20) part cannot see any relationship between civic organizations and the improvement of life and society by local experiences. Unfortunately, it illustrates quite an unfavorable picture of the activities of local civic organizations, and it seems that their activity do not have a kind of social impact. Regarding age distribution, mainly the younger ones evaluated more positively, denial seems to be growing by age, the oldest ones seem be quite uncertain. Acceptance also seems to be increasing by graduation of the respondents. The inactive, unemployed ones seem to be more denial or uncertain.

Interviewed representatives of the civic organizations stated and emphasized a divided picture, which they have mentioned to be related to the financial resources, where some citizens gain benefits, but the others are omitted. They frequently have programs for the youngsters, which explain some of the results and relevant relationship. They are working on applications to involve more unemployed, but they could not refer to successes lately.

Regarding the measurability of involvement depths, many categories (attributes) may be identified. Breaking down these involvement depths is still not ready and complex, since experts and experiences may refine the attributes. There must be rates and order, which are illustrated as follows:

- Employment and volunteerism being (please note that these ones are usually/most frequently members) mean strong involvement.
- Participating in programs/events or receiving other contributions (such as volunteers cutting the grass in front of a private house) or citizens support them means a medium involvement.
- Poor involvement means the relationship of those, who mainly theoretically deals with the subject or read about them or show sympathy but do not really act.
- The last category (passive or not involved) include the relationships of those who are not involved but do know about the phenomenon or those who do not have information on the activity of civic organizations at all.

Details of involvement depths regarding the settlement are illustrated as follows on *Figure 2.*

Results show a new, alternative approach of the impact of local civic organizations, where almost half of the population is involved, an additional 23 people are poorly involved and one third of the population is not involved at all. Compared to the previous results, the impact of civic organizations may not be considered as insignificant. We may describe an involvement curve, where the curve is asymmetric, and it is shifted to the right. Representatives of the civic organization explained these results by the inactivity of local inhabitants and also members of the civic organizations. For example, the only association has 22 members, of which 16–17 are completely inactive, and one of the managers does not understand the motives behind it. The only foundation has 3 members, and has only been working here for 1 year, which may also explain the slight involvement. Both of them referred and blamed the financial

issues and deficiencies behind the low involvement rates, and they also mentioned that totally they can reach approximately half of the local population by their activity.

A last question of the examination tried to reveal the strength of the impact of civic organizations. Results show that the impact of local civic organizations is intermediate or poorer *(Figure 3).*

Results revealed that the impact of the classics is primarily intermediate, and the impact curve in this case is shifted to the right. Mainly youngsters, intermediate qualification level respondents felt a stronger impact. Impact is slighter on the unemployed and rather intermediate for the inactive ones. Interviewed representatives explained these results by their uncertainty. They accept a fair intermediate level, although the leader of foundation could not talk about long experiences. They might accept the poor impact also, since, owing to the applications, civic movements have only started to strengthen lately. In some years, probably best results may be achieved.

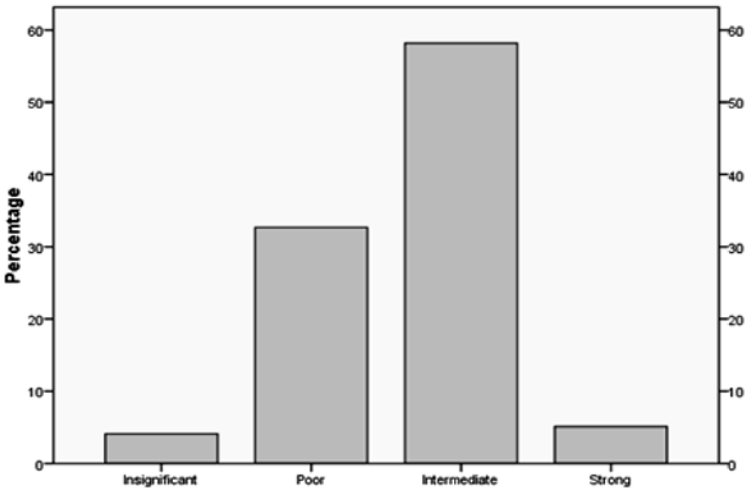

Figure 3: The opinion of inhabitants of the strength of the impact of civic organizations
Source: Private examinations, 2013.

Consequences

It is obvious that estimating the role, importance, effect of civic organizations is a complex activity, where the issue of civic involvement may also contribute to accessing a better picture.

Regarding the results, locally the impact and involvement of civic organizations may not be considered as strong. There is a kind of picture about a positive effect of organizations, which is not clear and dominant, at least not dominant for the living and society. Local citizens are rather intermediate or poorly involved, one third is not involved at all, and it is hard to be estimated whether they will be accessed at all in the future. The impact of organizations is rather intermediate or poorer, which results, added to the previous ones emphasizes that local civic organizations currently on the settlement are not strong enough to serve local tasks and to affect and influence local society deeply.

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SAFETY CULTURE MEASUREMENTS RESULTS IN THE AGRICULTURAL SECTOR

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Abstract:The author examined the safety culture and in relation to that the safety and health-related human factors. The examination was conducted primarily in the agricultural sector. Safety culture is also a key factor in business life especially in productive sectors. Basically, it determines the general work safety and occupational hazard situations, which may have an impact on business, competitiveness, and efficiency, and also employee satisfaction.The concept of safety culture is new in the applied sciences. Scientific investigations of safety culture are diverse, varying by country, science background and economic sphere. The author has created a dimension-model, which organically reflects the relations of safety culture within an organization, projected mainly on conditions in Hungary. Some safety culture dimensions have been also examined on the basis of international safety culture research methodology. The author investigated some safety culture dimensions on the basis of international safety culture research methodology. This method is suitable to investigate the status of the relevant safety culture dimensions at agricultural organizations. It has possibilities, in the course of safety culture operationalization, to mark out dimensions which as elements of organization culture are suitable for denotation of safety culture. In this paper the author publishes some of his results about the examined 18 agricultural enterprises. The author used a self-made questionnaire for the interviews. In the questionnaire he used Likert-type scale to measure the qualitative elements of the dimensions.

Keywords: occupational safety and health, operationalization, safety culture, dimension model
Running head: Safety culture measurement dimension model

1. Introduction

In today's changing world there are many factors which affect the efficiency, competitiveness and security of the work. A number of historical facts verify that the priority of the work outcomes depending on conditions of time and space is constantly changing. The general axiom is that the primary aim of an enterprise is the income and benefit. In this relationship the entrepreneur has interested in reaching the total income (Pfau 2002). In order to business achieve the process and results objectives it has to be mobilized resources, to invest. Nowadays – by the financial based economy and not by the human based economy – from all the resources the most upgraded is a classical resource, the human. That is the characteristic of resource distribution in the agricultural sector, every farm worker gets increasingly higher-value resource parts (instruments and machines) to operate to reach the aim of production. This phenomenon raises the magnitude of the responsibility and the value of human work.

In Hungary there are recognized and eminent representatives of research workshops – Berde (1999), Gyökér (1999), Kővári (1995), Bakacsi et al. (2000), Tóthné (2000) – all of them proclaim that in connection with maintenance of business success the human resources as skills, abilities, behaviors are crucial importance conditions of the long-term competitiveness. The same eminent representatives agree in that the human factors in relation to resources manifest in frame of organizational culture.

To view this problem from the employer's side that is an increased risk if an employee in connection with work safety is poorly motivated meanwhile operating an extremely valuable instrument. Therefore it is very timely and became very important to research the Occupational Safety and Health (OSH) across the economy (Dienesné et al. 2007). Therefore the research of Occupational Safety and Health (OSH) across the economy has become very timely and extremely important.

Hungary just like the European Union Member States is in the period of preparation for accession, and has already undergone a significant transformation. Hungary in the different producing spheres complied with quality requirements. In these changes the OSH regulatory system has made a very big step forward. By now, we can say that we have one of the most modern OSH regulatory systems in Europe. The problems do not occur in this area.

My research theme was the scientific investigation of OSH related safety culture, in the narrower field of Hajdu-Bihar

county agricultural organizations. I deemed it necessary, as main objective inside the safety culture investigation, to examine those factors, which have significant influence on OSH experts and board of managers' work performance as well. Therefore, it is necessary that the research results must be focused on the improvement of agricultural safety management work by means of safety culture development.

Objectives of the research:

- To develop a complex research and measurement-method, which is suitable for the measurement of the status of OSH and safety culture (and/or climate) dimensions in agricultural organizations,
- Reveal the main correlations in the Hungarian agriculture in connection with OSH situation, by the statistical analysis of secondary investigational database,
- To measure the OSH situations of sampling units by the collected primary objective investigational database,
- To measure the organizational material factors conditions, what can influence the OSH related safety culture,
- To analyze the OSH related official and non-official organizational commitments and orientations (order of values, attitudes, estimations, perceptions, preferences, contentment) both sides of farm workers and farm leaders in relation to human factors, belonging to safety culture and safety climate, in relation to human factors, belonging to safety culture and safety climate,
- To analyze the OSH related official and non-official organizational commitments and orientations (order of values, attitudes, estimations, perceptions, preferences, contentment) both sides of farm workers and farm leaders,
- To reveal the safety culture related relevant problems of agricultural organizations,
- To reveal the general characteristics of OSH related safety culture,
- To draw such conclusions that assist to the more accurate description of OSH related safety culture situation contributing to the good operation and more effective OSH management.

2. Antecedents of the research and materials and methods

I made my research in the frame of Debrecen University Faculty of Applied Economic and Rural Development Institute of Management and Organization investigational program that constructed by legal predecessor Department of Management and Work Sciences in 1994. The investigational program has called "Functional scientific investigation of undertaking management". This investigational program is modularly structured. The safety management fits in this modular system as a unit. This unit contains those dimensions that belong to human resource scientific investigations. These dimensions are directly or indirectly connected to OSH, or other aspects of work related safety and safety culture. The model of research is on Figure 1. In this research model, I gave a main feature of general direction of investigation and its connections with the research program. The model shows the necessary condition-system for achieving the aims of the investigation theme. Conform to my research subject matter as a first step I analyzed the OSH related national secondary statistical database and undertaking documents, for examples of injury certificates. Thereafter on the base of questionnaire data, I revealed and characterized the safety culture forming dimensions.

The connected point of views and dimensions in relation to the research are represented on three questionnaires. These were: one general questionnaire the organization identifier and the work environment objectively characterized in one "farm leader" questionnaire and one "farm worker" questionnaire. The questionnaires were compiled by own constructing on the basis of recommendations by CSEH - SZOMBATI – FERGE (1971), BABBIE (1998), HEWSTONE ET AL. (1999), TRIANDIS (1999), SEGALL ET AL. (1999), SHWARTZ (1999) MALHOTRA, (2005). In the compilation of general questionnaire I took SZENDRŐ and SZÍJJÁRTÓ (1979) objective workplace organization examining method into consideration. The main elements of this method are suitable to measure the state of technical supply and workforce conditions of the organization. The safety culture dimensions on the general questionnaire were represented by 72 items. On the farm leader questionnaire there were 22 issues with 178 items and on the farm worker questionnaire 26 issues with 171 items. The questions were formulated in closed form. The items contain those indicator concepts and statements, which are represent the dimensions of the safety culture. I used a Liker-type scale (–3...0...+3) for the characterizations and evaluations of the qualitative items.

Sample and respondents: The total sample consists of answers from 552 respondents from 18 agricultural juristic personality organizations in Hajdú-Bihar County in Hungary.

In the examined 18 organizations there were 1384 employees of which were 1220 physical workers and 164 managers. From this primary sample unit were interviewed 460 physical workers (37,70%) and 92 managers (56,09%). This interviewed sample was the secondary sample unit.

Used statistical methods for the data processing and evaluation: Different types of statistical data analysis method were used. The data processing was supported by SPSS statistical software. For the analysis of objective examination data which came from general questionnaires descriptive statistical methods such as distribution, frequency, and averaging calculations were performed. For the relationship detection among the obtained data variance analysis including Pearson's correlation test and significance tests were performed. I demonstrated the results in figures and tables. In the questionnaire studies from the obtained Likert-scale values for the characterization of items and dimensions I have made aggregate indexes. From the interviewee identifying data basic variables were created, which suitable for grouping

and thus for the comparative and descriptive analysis. Thus grouping variable were the gender, age, educational level, position, work experience and work accidents implication. Addition to that descriptive statistics hypothesis testing, one-tailed independent samples variance analysis and related tests of significance, as well as statistical (t-and F-) tests were used. From the non parametric tests the Mann-Whitney and Kruskal-Wallis tests were used. My aim was with the tests to reveal the significant differences among the basic variables.

I examined and made comparisons to the physical workers and managers' responses by the point of views as gender, age, educational level, position, job experience to detect the significant differences. I made comparisons among the physical workers and managers in relation to safety related orientations (attitudes, order of values, optimism-pessimism and contentment).

3. Results and Discussion

By the statistical analysis of the national agricultural workforce and OSH statistical databases I pointed out the agricultural sector's OSH related situation, what is rooted in the past. Executing the Pearson's correlation test, on the 99,9% reliability level significant correlation was found among the three data series (Figure 1, 2, 3). Between the tendency of number of agricultural fatal accidents (Figure 1) and the tendency of number of agricultural employees correlation value was 0,983. Similarly to this indicator between the tendency of number of agricultural employees and the tendency of number of reported work accidents *(Figure 2)* as well as between the tendency of number of agricultural fatal accidents and the tendency of number of reported work accidents the correlation was equally 0,993 *(Table 1).*

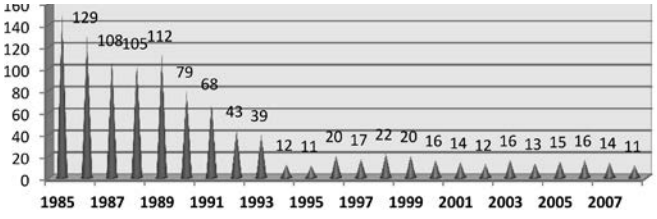

Figure 1: The tendency of number of agricultural fatal accidents from 1985 to 2008 in Hungary (number of cases/year)
Source: on the basis of KSH (1985–1991) & OMMF (1992–2008) data, own construction

Figure 2: The tendency of number of reported work accidents in the agricultural sector from 1985 to 2008 in Hungary
Source: on the basis of KSH (1985–1991) & OMMF (1992–2008) data, own construction

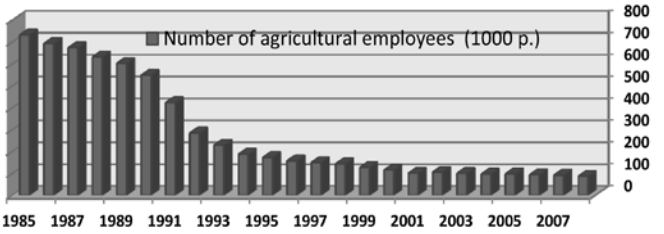

Figure 3: The tendency of number of agricultural employees from 1985 to 2008 in Hungary
Source: on the basis of KSH (1985–1991) & OMMF (1992–2008) data, own construction

Table 1: The Pearson's correlation test results among the tendencies of number of agricultural fatal accidents, number of reported work accidents and number of agricultural employees

Variables		The tendency of number of agricultural employees 1985–2008	The tendency of number of agricultural fatal accidents 1985–2008	The tendency of number of reported work accidents 1985–2008
The tendency of number of agricultural employees 1985-2008	Pearson Correlation	1	0,983(**)	0,993(**)
	Sig. (2-tailed)		0,000	0,000
	N	24	24	24
The tendency of number of agricultural fatal accidents 1985-2008	Pearson Correlation	0,983(**)	1	0,993(**)
	Sig. (2-tailed)	0,000		0,000
	N	24	24	24
The tendency of number of reported work accidents 1985-2008	Pearson Correlation	0,993(**)	0,993(**)	1
	Sig. (2-tailed)	0,000	0,000	
	N	24	24	24

Source: on the basis of KSH (1985–1991) & OMMF (1992–2008) data, own processing,
(**): the correlation is significant at 0,01 level (2-taild)

In this context on the basis of Pearson's correlation tests I proved that the number of reported work accidents as well as the number of agricultural fatal accidents statistical apparent improvement clearly caused by decreasing tendency of the number of agricultural employees. In other words the decreasing tendency of the number of agricultural employees is a clearly effective factor and the agriculture is still the same high-risk sector, just as it was 25 years ago.

In relation to operationalization of safety culture I determined a dimension collection, which suitable for describing and characterizing the organizational agricultural OSH related safety culture. In order to illustrate this I created an OSH related organizational safety culture dimension model (SCDM) *(Figure 4).* This SCDM model represents the correlations among acting factors, which have direct or indirect influences on agricultural organizational OSH related safety culture.

Figure 4: The OSH related organizational safety culture dimension-model
Source: own creation 2011

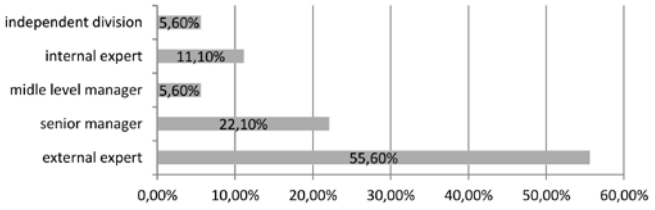

Figure 5: The OSH related educational and training tasks managing percent distribution among experts depending on organizational status
Source: own processing 2009

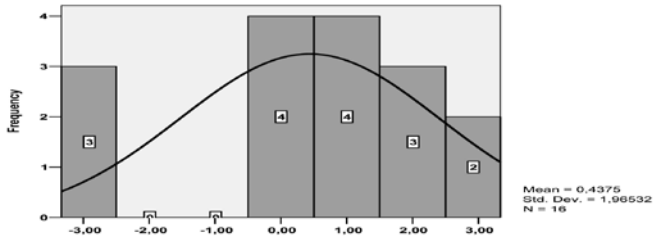

Figure 6: Is the worth the risk-assessment preparation costs, compared with its benefits? Senior managers evaluations (–3 not at all … +3 very worth it)
Source: own processing 2009

There are a number of factors which have influence on the workplace safety culture.

Therefore connected with the influential material factors, I examined the infrastructural conditions of the organizations and the machine tool system status as well.

In the plant growing sections of the examined organization the average age of the machines is between 5-12 years, but there are 17, even 35 years old machines as well. Therefore in connection with machinery operation of plant growing sectors as a characteristic it can be stated that the new and old machine technology exists together. This situation as a result brings in a powerful risk challenge for machine operators and machine maintainers. The responsible technicians of the examined organizations stated about their own maintenance efficiency that, the main difficulties are the tool supplying and instrument equipping. Investigating the corporate OSH documents it can be stated that at the participant organizations the OSH related tasks are managed by outsider experts 61%.

The OSH related educational and training tasks managing numerical distribution between experts on the basis of organizational status are shown on *Figure 5.*

In connection with risk-assessment it was stated that every examined organization was in possession of this document. Since this kind of document only in two cases was made by internal experts, virtually without costing. For the other cases, where was cost account, consequently, I felt it necessary to evaluate the cost-benefit relationship of risk assessments by senior managers.

As a result, the senior managers' evaluations were shown in the 6th Figure. 18.8% of the senior managers declared that the document no provided benefits and the procedure were not worth its cost. The percent of the fully contented senior managers was only 12.5%. They declared that this document is very worth and useful for risk assessment. However, by the overall assessment, the judgment was the average usefulness, as a senior manager considered opinion about the benefits of the organizational risk assessment documents.

Assessing the qualification levels of OSH professionals, it was found that the rate of the top-level qualification was 44.5%, the medium-level qualification was 44.4% and 11.1% was the first grade qualification rate. On the basis of examination of the injury certificates what was find at the primary sample unit I established and revealed that the overwhelming majority of work accidents caused by human factors. From the groups of source of risks as the handling of tools, the work and the work environment, have vast proportion as work accidents causes.

Moreover on the data base of the injury certificates it is established that the injured workers mainly not interrupt their own work, indeed in the cases when incapacity causing accidents of not more than 3 days, the workers don't considered their own injuries as than a workplace accident or even an accident, just a passing thing.

In the cases of workplace accidents and injures appearing that kind of worker attitude and behavior expressly characterize the safety culture – within this the non-official organizational safety commitments – related behavioral habits. Thus, better understandable the comparatively fewer number of not more than 3 days incapacity causing accidents.

The main comparative examination results of the researched safety culture dimensions: According to the examinations, in the case of leaders' estimation of mistake management- impacts on the safety at work *(Table 2),* main acting factors by the leaders are decision-making mistakes, inspectional mistakes and false instructions.

The organizational communication problem and bad command are still regarded as significant factors.

It can be stated that, the interviewed representatives of different managing-levels – in connection with OSH – have attached greater importance to those managing-mistake

factors, which were expressly connected with their own managing tasks and competences.

In the questionnaire, the safety- management tasks are separated into seven parts. Thus, I have divided the management tasks OSH related planning, organization, decision-making, execution and supervision parts as well as the management tasks supporter OSH related information sources, and regarding to organization outside and inside information sources as well.

Figure 7 shows the estimations in general and the managing levels about the management tasks importance. From figure 7 it is ascertainable that from the leaders' point of view the management tasks have positive domain preference.

Table 2: Leaders' estimation of managing-mistakes impact on safety at work by managing levels

Managing mistake variables	Work place status			Kruskal-Wallis Test Signifi-cances
	operative leaders (average)	Middle level man-agers (average)	senior managers (average)	
1. The unclear situation of powers and re-sponsibilities among leaders	+1,56	+1,07	+1,00	0,236
2. Bad decision making	+1,78	+1,48	+1,60	0,376
3. False instructions	+1,89	+1,33	+1,10	0,017
4. Wrong forming of plan of work	+1,44	+1,00	+1,00	0,068
5. Bad command: too difficult or too com-plicated, not suitable for professional	+2,11	+1,11	+1,10	0,001
6. Wrong determination of daily norm	+1,78	+1,11	+1,00	0,011
7. Bad leadership style	+1,89	+0,93	+1,20	0,007
8. Insufficiency of leader-worker rela-tions	+1,78	+1,07	+1,20	0,088
9. Kommunication disturbs	+1,44	+1,33	+1,10	0,318
10. Inspectional mis-takes and imperfec-tions	+1,78	+1,56	+1,20	0,138
Average index number (from -3 to +3-ig)	+1,74	+1,15	+1,15	–

Source: own processing 2009

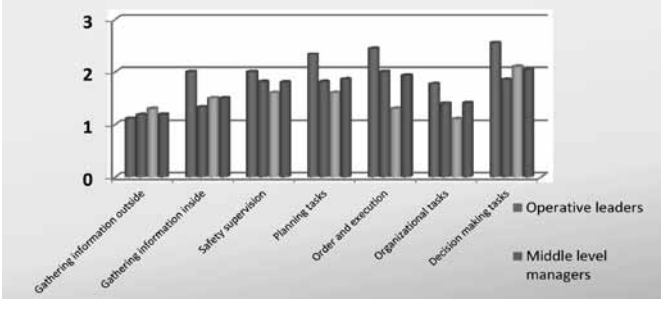

Figure 7: The estimations of the safety management tasks by the mangers
Source: own processing 2009

By the leaders, general estimation in order of rank of preference the decision-making tasks are on the first place, this is followed by the order and execution task groups.

The OSH related information gathering from outside and the organizational tasks groups have the least preference values. From Figure 7 it is ascertainable that on the operative leading level the OSH related tasks are relatively high. From these results, it has inferred that operative safety-management tasks mostly delegated to lower managing levels.

Among the safety-management tasks there is an order of relevance with 95, 9% likelihood, mostly observable at executions – of OSH related orders – and OSH related decision-making tasks as well. Therefore the operative leading level has a shear in doing execution and decision-making as well. The descending rate follows the middle and senior managers. These results characterize the real situation in relation to safety-management tasks distribution. These tasks in empiric relation are met mostly by operative leaders. Hereby it is interpreted that why the operative leaders in their own work evaluated the safety-management tasks higher level outweighed from the average evaluation included the decision-making tasks as well.

From the evaluation of safety culture acting factors is statable that the highest evaluated influential factor is the technological modernity, and this is followed by the others evaluated factors descending rate, just like organizational commitments and organizational order of values.

These results, conformity confronted with previous results, in connection with safety culture have reflected a fundamental technical way of thinking extended to the studied population. At the examination of age-groups was statable that tendency, that the evaluation of educational level has an influence on the safety culture, parallel with the increase of age got higher scale values. Among the age-groups similar significant tendency was statable in the case of organizational traditions evaluation.

On the basis of the attitude examinations results statable and justifiable that both the leaders and workers have a strong positive attitude with tested factors. The farm leaders gave relatively higher scale values to the examined 25 attitude factors than farm workers. Significantly different attitudes were between the farm leaders and farm workers.

These are mostly provable in the cases of work-group dynamics and activity regulatory factors as well as relation to technical safety status. These attitude differences have been arising from the organizational social position as well as from the characters and connections with the work environment. I measured the farm worker's risk assumption separately *Table 3* shows the results of the analysis.

The risk assumption attitude variables are visible on table 3, which was placed into the decreasing order of the attitude values. It is clear from the table that the first and second "Bigger risk for bigger payment" attitude variables are the strongest ones. Therefore in the sense of the preference of these two attitude variables the undertaking of the risk mostly depend on the expected profit, or rather the undertaking of the risk depends on the money what was offered for the work.

Table 3: The farm workers risk assumption attitude strength in descending order by the values of the variables

Risk assumption attitudes variables	Average values	Standard deviation
1. I can undertake more difficult complex work compared with my qualification if it is paid more.	+ 0,74	1,746
2. I can undertake more dangerous work if it is paid more.	+ 0,41	1,857
3. I do not reject the boss, if it would be needed, I do not do it then.	– 0,66	1,857
4. If the boss says "I give you a dangerous work for the same money" I undertake it.	– 0,71	1,634
5. I would work even with obsolete not securely working machines or tools as well.	– 0,77	1,799
6. The danger does not matter if the stake is the daily norm.	– 0,78	1,805
7. The primary point of view is not the safe execution of the work.	– 1,82	1,450

Source: own processing 2009

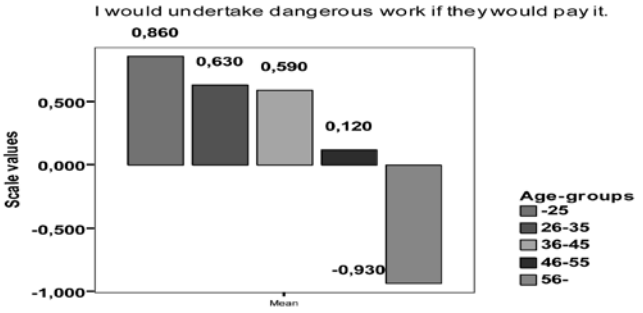

Figure 8: Analysis results about the employees' attitude of assumption of risk in relation to the material motivation. The figure shows it according to distribution of age-groups.
Source: own processing 2009

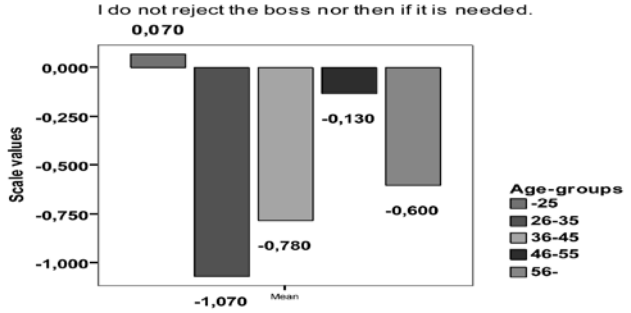

Figure 9: By the managerial authority onto the assumption of risk predisposing attitude effect distribution among the age groups
Source: own processing 2009

The farm workers in exchange for the suitable payment what they think, they would undertake more complicated and other professional knowledge demanding works, compared it to their own skills or abilities. That situation automatically brings about a considerable work safety risk factor from the beginning. From the result of the analysis is statable that the attitude of the assumption of risks among young age-group rather focuses on to avoid it than to accept it. However in this age group they can resist the organizational and managerial expectations less and the cash award motivates them to the assumption of risk mostly *(Figure 8).* The prevailing effect of the leading power, and smaller resistance capacity against leaders expectations *(Figure 9)* and, arising from the young persons' life situation, too easy motivating possibility for risk-taking, are reduce the degree of freedom of the choice.

Therefore in terms of risk that is statable the most exposed age-group in this sample is the younger than 25 years group of people.

This established defencelessness based on the examination of attitude variables shows a gradually decreasing tendency with the progress of the age. In connection with the assumption of risk the aged employees have the most consolidated attitude.

The aged employees neither take dangerous work in their own attitude nor if more payment is offered, nor if the leader expects it and nor if the day's work will not be finished in time.

It established that the examined attitude variables which are connected with work safety are stronger in the secondary sampling unit. These attitude variables unambiguously relate to the appearing components of the functional-connected organizational orders of values and order of norms. These components have been also appearing in the non-official organizational safety commitment of safety culture.

It established that the efficiency of the OSH regulations was mostly generated by the un-ambiguity, the concreteness and the consistency. The order of these values in this list is relevant in the examined organizations. The efficiency of the regulations greatly increasing if under the leader's supervision and the agreement of executive partner are combined.

In connection with the direction manners evaluations it was established that the evaluations are creates an idealized order of the direction manners and/or modes of provisions in the both circle of farm leaders and farm workers. I established that from the elements of the directing manners those receive the bigger scale value, which higher increases the degree of freedom of the instructed person, in the implementation.

From the examination of participants' evaluation it is ascertainable that - concerning the judgment of the manner variants of the labour protection instructions and/or directions - the direction of the elevation strength of the degree of freedom was growing.

In connection with the dimension of OSH contentment analysis I established that the OSH contentment hardly exceeding the average level (table 4). Between the groups were differences at the case of certain variables.

I established that the farm leaders are significantly more discontented with the general state of the OSH situation, than the farm workers.

I established that the farm leaders are significantly more discontented with the general country-side state of the OSH situation, than the farm workers.

Significant difference arose in connection with the contentment of supply situation of work clothes; leaders were more contented, than the employees. On the other hand,

the evaluation of the effort for the reduction of the monotonous work, the farm workers have high-level contentment than leaders have.

Based on the used scale values that is generally statable that, in connection with the contentment variables a middle attitude characterized the asked participants.

Table 4: The results of the analysis of contentment examinations regarding to general and local OSH situations by farm leaders and farm workers

Contentment with (the)	Leaders 16,7 %		Workers 83,3%		Total	ANOVA Sign.
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	
1. … general situation of agricultural workplace safety	-0,15	1,264	+0,39	1,473	+0,30	0,020
2. … your fellow-workers readiness for to help each other	+0,76	1,479	+1,25	1,369	+1,17	0,029
3. … your own work-safety situation in which you are working now.	+0,89	1,120	+0,99	1,428	+0,97	0,669
4. …severity of OSH requirements.	+0,63	1,372	+0,93	1,458	+0,88	0,200
5. …relations between leaders and workers	+1,17	1,253	+0,95	1,665	+0,99	0,393
6. …work environment of this place compared with another workplaces	+0,87	1,310	+0,77	1,520	+0,78	0,664
7. …your own work environment effects on health	+0,26	1,373	+0,04	1,808	+0,08	0,432
8. …cleanness of your work environment	+0,37	1,388	+0,62	1,616	+0,58	0,324
9. …efforts to prevent the work related injuries and disorders	+0,76	1,303	+0,22	1,783	+0,31	0,052
10. …supply level of OSH equipment	+0,67	1,415	+0,42	1,802	+0,46	0,363
11. … supply level of work-clothes	+1,02	1,757	+0,30	2,125	+0,42	0,032
12. …safety culture of your organization	+0,67	1,367	+0,52	1,735	+0,55	0,575
13. …efforts for reduction of the monotonous work	+0,07	1,289	+0,65	1,793	+0,55	0,036
Scale index (from -3 to +3)	+0,614	–	+0,619	–	+0,618	–
Scale intervals: from -3 to -2,6 extremely discontented; from -2,5 to -0,6 discontented; from -0,5 to +0,5 medium-level contented; from +0,6 to +2,5 high-level contented; from +2,6 to +3 extreme-level contented.						

Source: own processing 2009

4. Results

It should be to emphasize that these results only applying to the sample. Naturally these results have generalizable characteristics, but the research sample size and the special geographic and economic area are not suitable for statements of general regularities. However, these results have characterized some basic patterns.

The main results are:

- In connection with the operationalization of agricultural OSH safety culture and atmosphere, I defined dimension groups, which are suitable for characterization of the safety culture. Onto the demonstration of this I created an own, independent organizational OSH safety culture dimension model, what depicts the factors affecting the safety culture and depicts of those organizational correlation structure as well.
- I elaborated an own independent research model and an included research method which are suitable for complex measurement and characterization of the organizational status of the OSH safety culture.
- Based on the examinations of the national secondary data, such as data of the agricultural work accidents, the fatal work accidents data and the agricultural employees' data number changes, I proved that, the improvement in the agricultural accident statistics, caused unambiguously by the decline of the number of employees' . For this, that is statable, the agriculture in our days is similarly risky sector than it was 25 years ago.
- I verified that, the interviewed representatives of the different managing levels - relating to OSH – have an attached importance to those managing-mistakes factors, which were expressly connected with tasks, competences and roles of the managing-levels.
- I revealed the correlations among the attitudes which linked to the assumption of risk of the young age-group. At the young working layer the prevailing effect of the leading power, and smaller resistance capacity against leaders expectations *(Figure 10)* and, arising from the young persons' life situation , too easy motivating possibility for risk-taking, are reduce the degree of freedom of the choice. Hereby that is statable that the most exposed age-group for the risk challenges of the workplaces is the younger than 25 years age-group.

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CONSUMER ATTITUDES AND PREFERENCES ABOUT THE PORK MEAT IN HUNGARY (Based on cluster analysis)

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Abstract: In my study I wish to investigate the fact that how the pork consumption of Hungary changed during the last years. This study focuses on consumer's attitudes about (pork) meat, what do they think about the healthness of the different meat type, what are the strengths and weaknesses of pork meat, what are the main features of good quality pork meat, what are the major pork purchase influencing factors and what are the favourite food of the respondents from pork meat etc. Then I analyze the tendency of these values (cross tabs, bar/pie charts, means, Chi-square), where can be found significant differences, and make a cluster analysis to identify the pork consumers in Hungary.

Keywords: pork consumption, place of procurement, price, strenghts, weaknesses, good quality, favourite food, significance, frequency, cluster analysis

Introduction and objectives

The actuality and importance of the chosen subject is justified by the trends observed in the recent years, show that questions concerning nutrition, food and food safety are gaining more and more significance. One of the biggest challenges of the 21st century is to ensure a stable, sustainable and safe food production for the continuously growing population of the world. The problematic of food production and supply are highly complex, as nowadays, almost 13% of the world's population is starving (FAO, 2011) and cannot have sufficient quantity and quality of food, meanwhile on the other parts of the world; obesity is causing socio-economical problems.

Determining factors of food production and the change in consumer trends can influence as well the demand and consumption of food. The change of consumer habits, the decisions of the consumers can not be calculated. But they could be observed and analysed. Consumers can choose and select from a wide range of products, from the cheaper to the premium category products and it happens a lot, that even the consumer doesn't know for sure why he or she selected or preferred a product. Today's modern customers bring their decision by taste, health, food quality and safety, as a consequence of the recent international and national food scandals. In my research work, the focus is on the consumption of animal based food products; more precisely my thesis will conduct its research on pork meat consumption.

I have chosen for my research work this subject, as I wanted to deal with an issue that is influencing our everyday life, our lifestyle and welfare and our health. For that reason, my thesis is focusing on analysing consumer habits, preferences and attitudes related with pork consumption, namely on the areas of nutrition marketing. Hungary's population consumes traditionally pork meat and it is one of the most popular and consumed meat, so I have chosen pork meat to be in the highlights of my research.

The selected subject has been analysed with primary and secondary research work. In order to achieve this work, I have collected, assessed and analysed the relevant national and international scientific literature, which helped as well in the judgement of the market position of pork meat. Following this practise, based on the data deriving from different sources, I have conducted my secondary research work. In order to determine the market position of pork meat I have formulated new, more informative data lines with different statistical and other methodologies (basis and chain coefficient, indexes, means and price elasticity indicators).

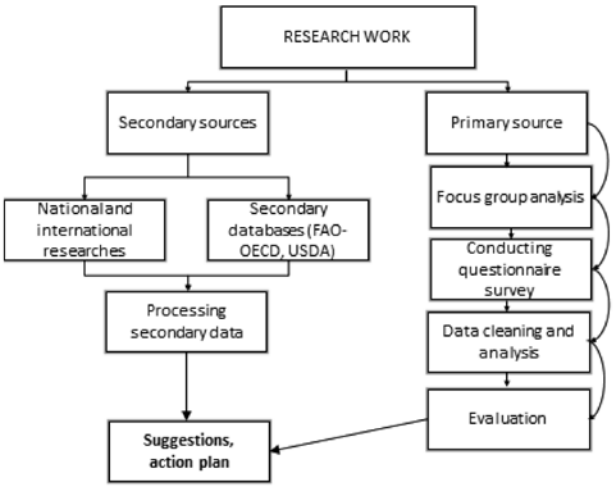
The main objective of my primary research was to formulate my conclusions on pork meat consumption in Hungary by the help of the data of the sample (1201 questionnaires). I will analyse separately the buying habits of the Hungarian consumers, the consumed quantity, and the differences of the consumer attitudes. I will examine as well how much the results of my questionnaire are in line with the conclusions of other scientific author's in the subject. My objectives related to my primary research is (1) to reveal the attitudes and preferences of consumers towards pork meat consumption in Hungary; (2) to find breakout points from the current situation in order to ameliorate the perception of pork meat and to scientifically support my recommendations.

4 hypotheses were formulated related to the primary research work:

1. Most of the Hungarian consumers believe that chicken meat is healthier than pork meat.
2. There is a significant difference between genders regarding the frequency of pork consumption.
3. For most of the domestic consumers, the most important aspect in the course of pork purchasing – in comparison with its competitor products – is the relative value of retail price.
4. Late in life, a higher portion of elderly domestic consumers prefer pork meat and pork based products.

Method of the investigation

I have divided my research work on two parts: on analysing framework, on research question and on hypothesis, focusing on the information required for my research. In case, we would like to group the information into a structure, the most general criteria is, if we are talking about finding, harmonising, grouping and synthesising of already existing database or we have to conduct a totally new market research. Basically, this makes the difference between primary and secondary market research. *Graph 1.* is showing how the structure of my research work was set up.



Graph 1: Synthesis of my research work
Source: Own editing, 2012

In secondary research I have elaborated several purchase and food consumption models related to the subject and I have concluded, that from these models' the most suitable one for my work is the one HAJDUNÉ-LAKNER, 1999 had set up, as it is using similar factors, as I had used during the process of the scientific literature (the model is representing the relation between food consumer behaviour, food consumption and nutrition and health).

From the acquainted publications and databases, I conducted my secondary research and collected the data of consumer price and average net earnings in Hungary for the period of 2000-2009. From these data I determined the elasticity of demand, the cross-elasticity of demand and the income elasticity of demand. I have divided the primary data collection as well on two parts: namely on qualitative and quantitative research. In the frame of the qualitative research, before the questionnaire assessment - to help to put together the questionnaire and the determination of the possibilities of answers – I conducted a focus group interview. For the quantitative research I chose the method of questionnaire survey. By the communication channel, the survey was oral, by its subject, it was consumer-type, by the theme, it was specific (concentrating on pork consumption) and looking at its frequency it was ad-hoc.

The main objective of my consumer survey is to get to know the attitude of the consumers, the reasons behind them and to explore the factors influencing them and by the analysis I would like to forecast the prospective reactions of the consumers regarding pork meat consumption. We can get acquainted with customers' reactions if we presume that there is permanence amongst the past, present and future attitudes and we conclude on the future from the past and the present, respectively we ask questions on future intentions. The socio-economic criteria of the consumers are crucial for the survey, as the consumer behaviour and decision is highly determined by the criterion of the consumer.

For conducting my survey, I had developed a questionnaire on my own, from which after the query, 1201 turned out to be valuable. The title of the questionnaire was „ Analysis of consumer preferences and attitudes towards pork meat consumption". I have used mostly closed questions, but there was a possibility for open questions and own opinions as well. The structure of the questionnaire followed the classic 4P, therefore the questionnaire begins with the product, namely pork meat or product made from pork (recognition, popularity, frequency of consumption and product differentiation, etc.). The questionnaire was continued with the place of procurement (Place), followed with questions regarding Price and finally questions related to Promotion had been asked. There were some questions on general knowledge and some filtering, connecting, reminder and control questions as well. At the end of the questionnaire, I have formulated 14 statements that could be rated on Likert-scale from 1 to 5, as this is the most frequently used scale for attitude measuring. After surveying the consumer habits of pork meat, I have phrased questions segmenting the customers, in order to group them by different criterions (gender, age, marital status, education, economic activity, size of settlement and income).

The questionnaire survey[1] took place at country level between 30 November 2010 and 31 January 2011. During

[1] Places of sample collection: Abony, Bagod, Balinka, Békéscsaba, Boldva, Budakalász, Budakeszi. Budaörs, Budapest, Bükkösd, Debrecen, Derecske, Dévaványa, Dombóvár, Dunasziget, Ebes, Eger, Egerszalók, Földeák, Füzesabony, Gödöllő, Gyöngyös, Győr, Gyula, Hajdúböszörmény, Hajdúsámson, Halásztelek, Hódmezővásárhely, Jánossomorja, Kakasd, Kápolnásnyék, Kaposvár, Kazincbarcika. Királyegyháza, Kisbér, Kiskunhalas, Kurityán, Levelek, Mágocs, Magy, Mindszent, Miskolc, Mosonmagyaróvár, Múcsony, Nagykálló, Noszvaj, Nyíregyháza, Orosháza, Páhi, Pécs, Rákóczifalva, Siklós, Szeged, Székesfehérvár, Szentlőrinc, Szolnok, Tapolca, Tardos, Tata, Tatabánya, Teskánd, Tiszatelek, Újszilvás, Varbó, Zalaegerszeg.

the sampling, the structure of the different regions and settlements was adequate for the quote determined by the National Statistical Office, therefore the representativity could be ensured. In case of 'gender' and 'age', the data of the sample showed minimal difference from the ratio published by the National Statistical Office, therefore the sample is representing the consistency of the basic set by four factors (region, type of settlement, gender and age).

In the regions and settlements the method of 'random walking' were used in order to ensure a total suddenness of the selection of respondents. Therefore, all respondents had the same chance to get into the sample. From the requested households the person for the interview had been selected with the method called 'birthday key', ensuring as well a total suddenness (VERES – HOFFMANN – KOZÁK, 2009).

For the selection of the methodology, I examined similar surveys on food consumption in the domestic scientific literature in order to compare how other authors conducted their surveys and what kind of methodology they used. During the analysis of the questionnaire, I constantly used the „best methodological approach" found in the domestic (SZAKÁLY – SZIGETI – SZENTE, 2009, SZŰCS – TIKÁSZ – KOVÁCS, 2008, SZAKÁLY – FÜLÖP – NÁBRÁDI, 2008) and international (NGAPO, 2003, FORTOMARIS, 2005, VERBEKE, 2010, XING, 2009) scientific literature. I had processed the questionnaires with SPSS 19.0 statistical software. From the primary data collection with the methodology of descriptive statistic, I have calculated means, minimum, maximum, median, mode and deviation and relative frequency. For the evaluation of the statements - that could be answered on a Likert-scale from 1 to 5 – I have calculated different position indicators (mean, median and mode), dispersion indicators (range and dispersion), and indicators of the shape (skewness and kurtosis) and other indicators (sum, number of the set, minimum, maximum). I used two new methods for the analysis of the answers given on scale-type questions. The lowest 2 boxes are summing (SZAKÁLY – SZABÓ G., 2009) the most unfavourable opinions (answer number 1 and 2), top 2 boxes are showing the most favourable ones (answer 4 and 5). By my opinion, this method is really talkative in the case of consumer surveys, as it gives the possibility to compose bigger, but homogenous groups by the given answers. This reflects better the opinions of the customers. For the demonstration of the coherence between the questions, in the case of one variable method, I used significance analysis with Pearson-type Chi-square probe. For the multivariate data analysis from the methods based on dependence, I used cross-tables and at the end of the primary research, I made cluster analysis for shaping the segments of consumer behaviour. At last, it is important to mention that I used a 5% of error probability during the analysis of the significance and in the end I kept the results or rejected.

Results and discussion

The main objective of the primary research was to be able to conclude on domestic pork meat consumption by processing the results of the questionnaire developed by me. As a result, amongst the objectives of the primary research, one of the most important results was to map the preferences and attitudes of customers towards pork meat and to formulate recommendations on them. Based on the primary research I stated four hypotheses, which could be proved obviously or could be disproved.

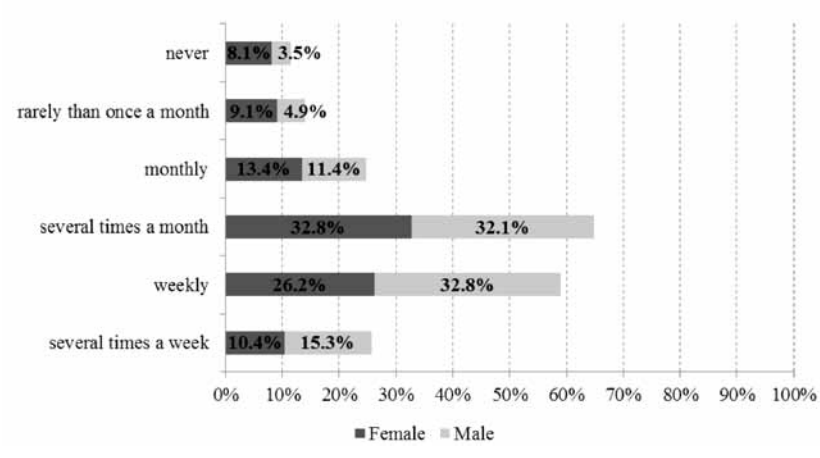
Hypothesis 1. of my primary research was that „*Most of the Hungarian consumers believe that chicken meat is healthier than pork meat*". From the answers on the question related to the hypothesis, I came to the result that customers really do think that chicken meat is healthier than pork meat, 28.3% of them, so the hypothesis was proved. From the five possible answers the first was the fish with 57% (685 persons), the second was chicken meat with 31.3% (376 persons), the third was turkey with 5.4% (65 persons), pork was the fourth only with 3.0% (36 persons) and finally beef meat with 2.2% (26 persons) (*Table 1*.). Altogether I concluded that the half of the respondents found fish as the healthiest and one third found chicken. Regarding gender differences, I stated that by the opinion of women white meat (fish, chicken, and turkey) is healthier, while men find red meat (pork and beef) healthier (as you can see on *Table 1*., % within question). The cross-table of the age showed that younger generation marked white meat and elderly respondents preferred red meat. Therefore my recommendation is to dispel the disbeliefs on pork meat being unhealthy (especially amongst youngsters), as the results reflect that the negative perception position pork meat at the last and of course this influences the consumption as well. In the future, female customers should be concentrated on, as they are the ones who purchase and prepare the food for the family. For the popularisation of pork meat, such strong points should be highlighted that are based on researches of modern nutrition science and arguments like 'it can be easily procured, it is not too expensive, fresh, it can be variously prepared and it is one of the most important source of protein'.

My *2nd hypothesis: „There is a significant difference between genders regarding the frequency of pork consumption"* was proved (*Graph 2*.). During the survey I found interesting differences between male and female customers and a significant difference could be shown (Pearson-type Chi-square p=0.000). 49% of male customers weekly or more in a week, 32% of them more in a month and 19% once in a month or rarely eat pork meat or food made from pork. In the case of female customers this portion was more balanced; 37% of them eat pork once a week or more, 33% more than once in a month and 30% once in a month or rarely. As a result, my recommendation is to focus on male customers in the campaigns of pork meat, because in higher frequency rate (several times a week, weekly) the consumption of male customers was always higher. Meanwhile in the case of lower frequency rate (never, less often than once a month), the portion of female customers was higher.

Table 1: Crosstabulation – "Which is the healthiest meat type from the followings? * Gender of interviewed"

		Gender		Total
		Male	Female	
Poultry meat	Count (capita)	180	196	376
	% within question	47.9%	52.1%	100.0%
	% of Total	15.0%	16.3%	31.3%
Turkey meat	Count (capita)	29	36	65
	% within question	44.6%	55.4%	100.0%
	% of Total	2.4%	3.0%	5.4%
Pork meat	Count (capita)	26	10	36
	% within question	72.2%	27.8%	100.0%
	% of Total	2.2%	0.8%	3.0%
Fisheries	Count (capita)	331	354	685
	% within question	48.3%	51.7%	100.0%
	% of Total	27.6%	29.5%	57.0%
Beef	Count (capita)	23	3	26
	% within question	88.5%	11.5%	100.0%
	% of Total	1.9%	0.2%	2.2%
I do not know	Count (capita)	6	7	13
	% within question	46.2%	53.8%	100.0%
	% of Total	0.5%	0.6%	1.1%
Total	Count (capita)	595	606	1201
	% within question	49.5%	50.5%	100.0%
	% of Total	49.5%	50.5%	100.0%

Source: Own editing based on primary research, 2012



Graph 2: Crosstab – Pork consumption frequency and respondent gender
Source: Own editing based on primary research, 2012

The *3rd hypothesis* of my primary research is *„For the most of the domestic consumers the most important aspect in the course of pork purchasing – in comparison with its competitor products – is relative value of retail price"*. For the proof of my hypothesis I asked in a separate question to rank the influencing factors of the purchase of pork. The descending rank of them is: freshness, price, fatness, and domestic product, healthy nutrition, farming conditions, packaging and advertisement, as it can be seen in *Table 2*. So my *3rd hypothesis* couldn't be proved, as most domestic customers choose to buy pork meat by its freshness, secondly by its price. My recommendation is to motivate buyers of pork not only with low price, but to highlight features of pork meat that could be important for the customers like reliable quality, domestic product and freshness. In this case, the customer can rely on these features, meanwhile price is continuously changing, but quality and reliability is stable.

The *4th hypothesis* connected to the results of the survey is *„Late in life, a bigger portion of elderly domestic consumers prefer pork meat and pork based products"*. The statement were in relation of my hypothesis (*I gladly consume food made from pork*) that could be ranked on a scale from 1 to 5. To determine that someone is gladly consuming pork meat, I took into consideration ranks 5 (I totally agree) and 4 (I agree in a small-scale). My survey focused on the question that in these categories, what is the portion of the different age groups and looked for the answer with the method of top 2 boxes (I considered the answers of 4 and 5 together). My hypothesis hasn't been proved by the significance analysis, as a result I couldn't prove the coherence between the two factors, and therefore my 4th hypothesis was rejected. You can see the results on *Graph 3*. Even so, I would recommend to produce new, modern tasted (e.g. Mexican, barbecue, chilli and pepper-mustard) half-finished and finished products from pork meat or rather the extension of product range suiting customer needs.

Based on the answers, it can be stated that the thigh of pork meat is the most frequently consumed part of the pork, than chop and spare rib. The rank of the most frequently consumed product from pork is bologna, salami, Vienna sausage, ham and sausage.

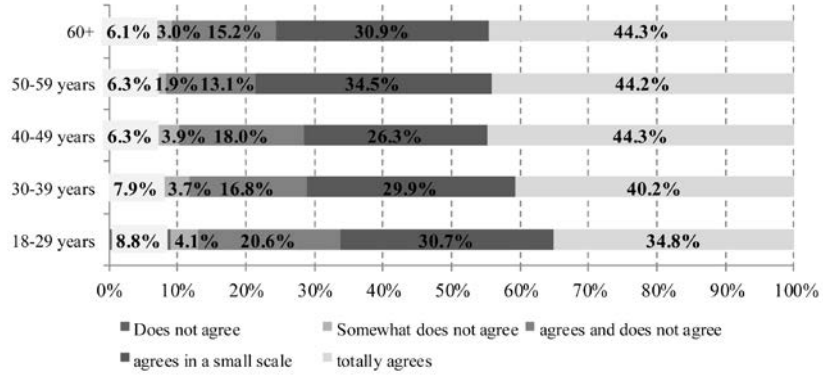
Regarding the place of procurement, I concluded from the data of the sample, that there is a significant difference with more background factors of the consumer habits of male and female customers. The place of procurement of fresh pork meat is the local butcher, or smaller meat shops (45.36%), as the customers believe that these smaller shops are the most reliable and the safest, as you can see on *Graph 4*. The second highest rate has the hyper-and supermarkets (28.56%) of purchasing fresh pork. Therefore the purchase in local stores trusted by the customers should be motivated, aiming to help the purchase and consumption of local products. 73% of the respondents answered yes on my question, if they buy meat from households or from the farmer itself.

The question examined in relation to age I can conclude, (that) the proportion of self-producing is relevant at the age of 60 and over (24.1%), at the same time buying from producer in the 30-39 and 40-49 age ranges. Buying at the meat store / butcher's is typical the age of 40-49 and 18-29 year olds. The 30-39 age categories leads the 'buying from market' section with more than 28% of the whole purchase. In discounts around

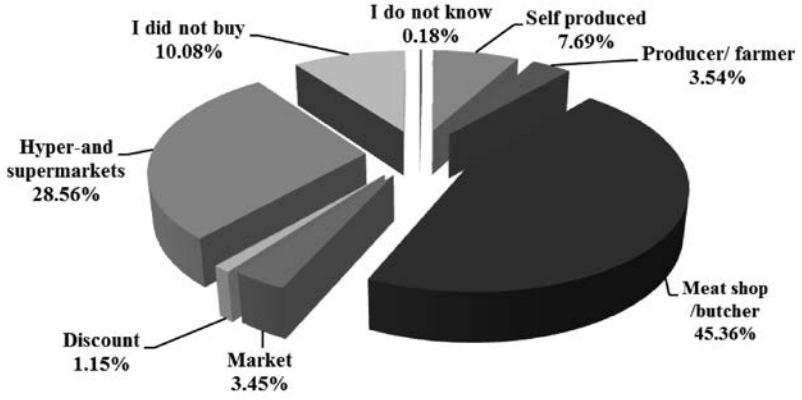
Table 2: Pork purchase influencing factors

	Freshness	Price (Ft/kg)	Fatness	Domestic product	Healthy nutrition	Farming conditions	Packaging	Advertisement
Mean	4.81	4.39	4.17	4.04	3.96	3.83	3.51	2.12
Median	5.00	5.00	5.00	4.00	4.00	4.00	4.00	2.00
Mode	5.00	5.00	5.00	5.00	5.00	5.00	4.00	1.00

Source: Own editing based on primary research, 2012



Graph 3: Degree of agreement with the 7th statement „I gladly consumer food made from pork by dispersion of age groups
Source: Own editing based on database, 2012



Graph 4: The place of procurement of fresh pork
Source: Own editing based on database, 2012

40% of the pork sales belong to the older individuals (60-year old or above) while the youngest category (18-29 year old) mainly do it in the hyper and supermarkets. Self producing swine is mostly typical in villages and towns where the population is less than 1000 people. Bigger cities' and county capitals' residents prefer hyper and supermarkets, at the same time the majority of the interviewed Budapest citizens chose markets. Blue-collar workers and pensioners own the biggest percent of buying from farmers and self-producers. Mostly white-collar workers do shopping at marketplaces. To sum up, I can conclude, there are significant differences between age and the place of procurement, since the different age ranges shop pork different places/shops.

On my question, if on the packaging information the place of origin should be marked, 70% of the respondents marked the answer 4 (agreed on a smaller-scale), 25% marked answer 5 (totally agrees) and especially active physical workers, unemployed people and housewives found that information important.

The obligatory content of nutrition (GDA[2]) marked on the packaging is really talkative and obvious information. By my opinion, the place of origin should be marked on the packaging with a new labelling. There is a lot of unnecessary information influencing the customer, but the place of origin is only one word most of the time and it doesn't even reflect the reality. My suggestion is to develop such a label for pork meat (or could be used for other products as well), on which place of origin is stated in different manners. As a result, the product could be tracked more efficiently from the farmer to the customer and food scandals could be avoided as well. Country of origin, the country, where it was raised and where it was cut and processed should be stated on the label of the packaging. In case, it was processed more times, all places should be stated.

In my questionnaire, I was curious, if customers believe that domestic products are better quality. I wanted to explore the positive attitude of the customers towards Hungarian pork with this question. From the answers, I figured out that 80% of the respondents found that domestic pork is better quality than the ones from abroad and 54% would pay more for this. Within these answerers, in the biggest portion active physical workers and pensioners could be found. The respondents have strong positive attitude towards pork meat that has no objective background. This was stated by the customers own, subjective opinion, but this could be useful for a marketing campaign.

As a next step with the help of an open question, I determined the ranking of good quality pork meat seen in *Table 3.*

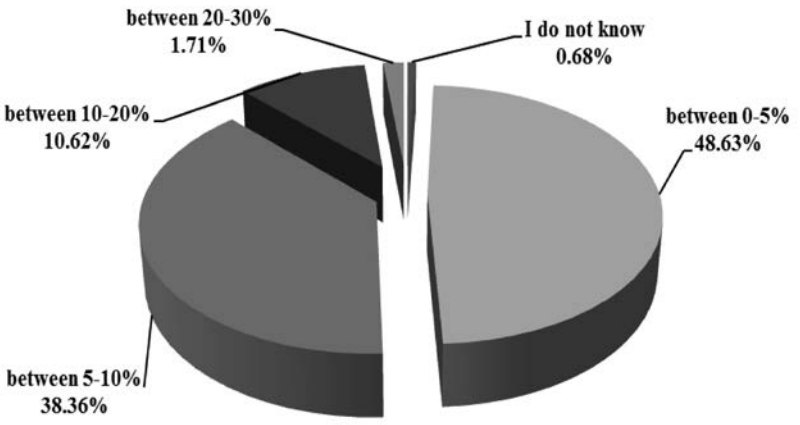
My observation is that the most important was the colour (43%), than the scent (11%), the taste and the flavour (7%), fatness (6%), appetizing (4%), consistency (4%), and other

[2]Guideline Daily Ammounts

Table 3: Features of good quality pork meat in descending order

Title	Frequency (piece)	Distribution (%)	Title	Frequency (piece)	Distribution (%)
Vivid colour	340	30.1	Not wet	16	1.4
I don't know	195	17.2	Not slimy	13	1.1
Nice red	106	9.4	Not dry	8	0.7
No scent	79	7.0	Not in bloody liquid	8	0.7
Not too fat	75	6.6	Do not have liquid	5	0.4
Tasty	58	5.1	Fine by touch	2	0.2
Nice scent	49	4.3	Hungarian	2	0.2
Appetizing	47	4.2	Warrant	2	0.2
Pink	43	3.8	Full of protein	1	0.1
Consistency	36	3.2	Clean	1	0.1
Short	22	1.9	Not frozen	1	0.1
Succulent	22	1.9	Sum	1131	100.0

Source: Own editing based on the database, 2012



Graph 5: Answers of "How much would you pay more for pork meat?" question
Source: Own editing based on database, 2012

By the ranking of the preferences of the strength and weaknesses of pork meat, in the case of strengths, two third of the respondents emphasized the diversity of it, the half of the sample found its taste as the second most important factor, the third was that it is easily reachable, than quality and price. Based on the answers it can be said that in the case of strengths for the answerers pork meat is a variable, tasty, easily reachable, reliable quality and not too expensive meat. In marketing campaigns targeting Hungarian pork consumption, these features should be emphasized. In the case of weaknesses, I appoint that the results show high similarity with customers' misbelieves, as the biggest weakness of pork is its „fatness" followed by the fact that it is considered unhealthy. These negative features should be in the focus of a countrywide educational campaign.

factors in the rest of the portion. In my opinion, it is not by hazard that except taste and flavour; all important factors are the ones visible. To sum up, I appoint that customers buying fresh pork meat judge the quality by empirical features (colour, scent, taste and fatness) and bring their decision with the help of the information influencing their senses.

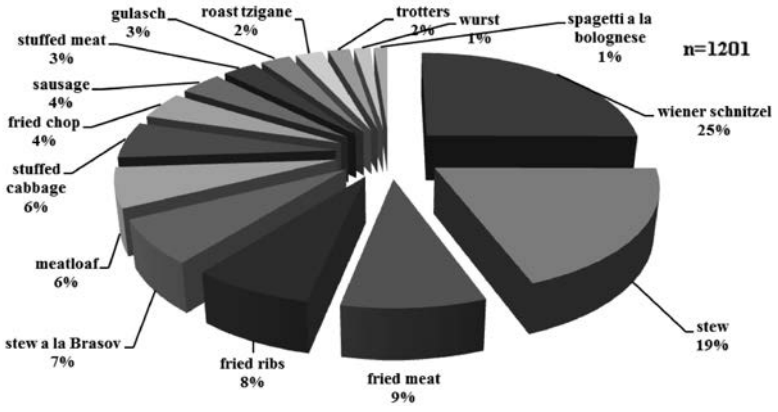
The rest of the questionnaire is on retail price. 26% of the customers said that they would pay more if information would be available on the conditions of producing and farming. This information underlines my recommendation already mentioned on labelling and the fact that customers require more information generally during their purchase. The information if customers would be ready to pay more (*Graph 5.)* lets us to think that the reservation price of pork could handle only 0-10% of increase in price. But for this increase in return, they would require more information, in order that they could bring their decision based on more information. This solution is recommended only for meat sold in hyper and supermarkets, as more information is needed in these cases, as packaging is the mute seller.

Table 4: **Strengths and weaknesses of pork meat**

Strengths	Number of respondent (capita)	Weaknesses	Number of respondent (capita)
Diversity	795	Fatness	675
Taste	579	Unhealthy	306
Easily reachable	431	Price	108
Quality	381	I do not know	45
Price	795	Quality	26

Source: Own editing based on database, 2012

Furthermore, I recognized that 13.2% of the answerers saw advertisements propagating pork meat and 76% saw it on TV. In my opinion, there is a high need for organised marketing activity that would build its strategy on educational campaigns.



Graph 6: **Dispersion of favourite food of the respondents**
Source: Own editing based on the database, 2012

Table 5: Results of cluster analysis

	„A" cluster	„B" cluster	„C" cluster	Value of Chi-square
Number of elements (person)	749	365	17	
Cluster features				
Gender	Balanced, but higher male ratio	Balanced, but higher female ratio	More than 80% male	p=0.020
Age	Mixed age groups, mostly over 40 years old	70% between 18-49	Between 18-39	p=0.000
Education	Lower education	Most of them graduated	65% graduated, 23% skilled worker	p=0.000
Marital Status	Half of them lives in marriage or in a relation	Lives in marriage or in relation	60% is single	p=0.001
Main activity	Active physical workers or pensioners	Active physical and intellectual workers	Pupils and active physical workers	p=0.000
Type of settlement	Lives in smaller settlements	Lives in a bigger city	Mixed settlements	p=0.002

Source: Own editing based on primary research, 2012

The last question of the survey (*Please indicate your 3 favourite pork based food*) was asked from curiosity in an open question. The answers were really heterogeneous, thus food reaching less than 1% was neglected. The most popular food was Wiener schnitzel, as 25% of the consumers chose it. The second was pork stew (19%), than fried meat (9%), fried rib (8%), stew a la Brasov (7%), meat loaf and stuffed cabbage (6-6%), but sausage and liverwurst, goulash and etc, could be found on the list. The heterogenousity of the answers underlines the diversity of pork meat, as from the same thing people love to make different food for them.

From the results of the questionnaire and by the *Graph 6.,* I would like to state that the favourite food of Hungarian consumers from pork meat is Wiener schnitzel, pork stew and fried meat. The three mostly mentioned food is part of the traditional Hungarian cuisine; therefore I believe that there is a need for innovative, modern recipes of pork meat and for new taste and product portfolio and to introduce these new products for a wider public. Currently, chicken meat serves as a basis for modern new recipes. In the gastronomy connected to pork meat, traditional Hungarian food can be found. In order to reposition pork meat, there is a need for renewing pork meat and to eliminate negative attitudes and to strengthen the positive ones.

The aim of the cluster analysis was to group my respondents into a homogenous group by some selected indicators. I formulated such clusters, whose elements were similar with each other, but they differed from the elements of other clusters. I have differentiated 3 clusters from each other, into which 1131 respondents could be assigned. The features of the clusters were determined with the help of cross-table analysis. The result of the cluster analysis is shown in *Table 5.*

With the help of the cluster analysis, I could prove that pork consumers can be differentiated from each other into three clusters and in order to enhance pork consumption the different consumer groups should be targeted with different marketing tools.

Conclusion

In the case of my primary research my objective was to explore consumer preferences and attitudes towards pork consumption and to make suggestions for the improvement of the perception of pork meat. I summarises the main results and the theoretical and practical capitalisation of the research:

- There is a significant difference between genders and meat found healthy by the respondents (p=0.000).
- Fatness (675 persons) and „unhealthy" (306 persons) were mentioned most frequently as main weaknesses of pork meat.
- There is a significant difference between male's and female's pork consumption (p=0.000).
- The most important factor by the purchase of pork meat was freshness (mean=4.81) and price was only the second factor (mean=4.39).
- Among the 7th statement of the questionnaire (I gladly consume food from pork meat) and the ratio of genders (p=0.000), main activities (p=0.000), education (p=0.000) there is a significant difference
- A significant difference could not be shown between pork consumption and age groups (p=0.951).
- The most frequently consumed pork meat is the thigh (19.1%), chop (14.1%) and spare rib (10.4%) and the most frequently consumed product is bologna (38.9%), and salami (34.4%).

- The two features mentioned most of the time was diversity (795 persons) and taste (579 persons).
- Significant difference can be shown among place of procurement of fresh meat and age group (p=0.000), education (p=0.000), and main activity.
- Significant difference could be shown by place of procurement of processed pork product, age, type of settlement (p=0.000), gender (p=0.000), education (p=0.000) and main activity (p=0.000).
- There is a significant difference among the importance of place of origin and age group (p=0.026) and type of settlement (p=0.010).
- Respondents found that domestic pork meat is better quality than the ones from abroad and there is a significant difference among answers and age groups (p=0.029), and type of settlement(p=0.000).

Summary

I showed by significance analysis, that there is a significant difference between the male and female consumers regarding pork consumption. I determined with the help of mathematical - statistical calculations that which parts of the pork are the most frequently consumed and where consumers purchase the product. I determined which features represent good quality for the customers and which is the most favourite food prepared from pork and what are the most popular products for grilling during summer time. This information could be useful for the producers and distributors. It was proved, that for the respondents during their shopping, retail price is not the only important factor, but freshness was considered the most important influencing factor. By the significance analysis, it couldn't be demonstrated that the older generation consumes pork meat more gladly. Furthermore after running the cluster analysis, I determined with the help of the background indicators who are the customers' preferring and consuming pork.

By my opinion, there is a high need for a marketing communication campaign at sectorial, community level that would build its strategy on educational campaigns aiming to dispel the disbeliefs of the customers. Only 13% of the respondents have seen or heard advertisements of pork and pork consumption, therefore it would be important to launch a targeted communication campaign whose aim would be the popularisation of pork meat and pork based products. With this we could open the door to inform customers about pork meat (place of origin) and to dispel the disbeliefs (fatness, unhealthiness) in order to increase the customers' trust.

From the point of the aim of the communication, informative advertisement could be successful, and in the focus of it, the advantages of domestic pork consumption should be positioned. Rational and emotional arguments should be used. From the point of the message simple, clean, easily understandable, strictly informative content should be emphasized.

We should exploit the diversity of pork meat and a novel, modern image of pork meat suiting the 21st century should be built. Children of the present are the future customers; therefore healthy nutrition should be substantiated in nursery and elementary schools.

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