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Changes and opportunities: investigating links between theory and practice in economy

FIRM CHARACTERISTICS AS DETERMINANTS OF CAPITAL STRUCTURE

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Abstract

The paper investigates the firm-specific determinants of capital structure. The data set consists of 58 listed companies (Baltic Stock Exchange) and 150 non-listed Latvian companies over the period 2005–2012. The author of the present study analyses firm-specific determinants of leverage, for example, size, asset tangibility, profitability and liquidity using correlation and multiple regression analyses. Empirical results reveal that size has an inverse relationship with leverage for both listed and non-listed companies. Asset tangibility is positively correlated with leverage for listed companies, whereas there is a negative relationship between both variables for non-listed companies.
Keywords: *capital structure, company size, liquidity, profitability, tangibility.*

Introduction

The choice of the capital structure has been analysed and discussed by both academics and managers for several decades. The starting point for the subject of capital structure is the irrelevance proposition by Modigliani and Miller (1958, 1963). Two capital structure theories have been prevailing – the trade-off theory and the pecking order theory, since then. The pecking order theory states that companies prioritize their sources of financing – at first they prefer to use internal funds, then to borrow, and finally, to issue equity as the last resort (Myers & Majluf, 1984). The trade-off theory argues that companies choose the debt and equity mix by balancing the benefits and costs of debt. If a company increases its leverage, the tax benefits of debt increase as well. At the same time, the costs of debt also rise (Kraus & Litzenberger, 1973).

The **aim of the research** is to evaluate the impact of firm-specific determinants on corporate leverage and, based on the empirical results, to provide conclusions. The **tasks of the research** are as follows: 1) to overview the results of previous research made on the firm-specific determinants of leverage; 2) to evaluate the relationship between capital structure and firm-specific determinants using correlation and multiple regression analyses; 3) to make conclusions. The **hypothesis of the study**: firm-specific determinants have an effect on capital structure.

Analysis is conducted on a sample of 58 listed companies (Baltic Stock Exchange) and 150 non-listed companies in Latvia over the period 2005–2012. The author analyses the relationship of short-term, long-term and total debt with profitability, size, liquidity and tangibility. In the research paper, the following qualitative and quantitative **methods of research** are applied: the monographic method, correlation and multiple regression analyses. The research is based on published papers on determinants of capital structure, as well as the information provided by the Baltic Stock Exchange and Lursoft. Correlation analysis is done using the Statistical Package for the Social Sciences (SPSS), panel data regression performed in STATA.

The remainder of the paper is organized as follows. Next section provides the review of recent studies on the subject. Then the methodology and sample of the study is discussed. After the methodology section, the author of the present study describes the empirical results. The final section concludes the paper.

Literature Review on Firm-specific Determinants of Capital Structure

This section introduces factors that are capable of explaining company leverage ratios and results of recent studies. Firm-specific determinants are company specific characteristics which may have impact on choice of capital structure. Empirical literature suggests a number of factors that may impact the corporate capital structure but this paper analyses only the most popular ones, which are included in regression models.

Tangibility. Tangibility of assets can be interpreted as a measure for the level of collateral. A high ratio of tangible assets provides more collateral. Therefore, more tangible assets mean higher leverage since lenders are more willing to disburse loans against collateral. Tangibility of assets can be measured by the ratio of net property, plant, and equipment to total assets, the ratio of research and development (R&D) expenses to sales, the ratio of selling, general and administration expenses to sales (Bessler *et al*., 2011). Most commonly, the tangibility is measured using the ratio of fixed assets to total assets (Cuong & Canh, 2012; Noulas & Genimakis, 2011; Feidakis & Rovolis, 2007). The previous empirical research has provided mixed results, but most found a positive correlation with the debt level (see Table 1).

Size. On the one hand, larger companies are more diversified and have better access to financial markets; therefore a higher debt ratio is expected. On the other hand, size can be regarded as a proxy for information asymmetry between company's insiders and capital markets. Therefore, a negative relationship between leverage and size can be stated. Firm size is usually measured as the logarithm of total assets or sales (Bessler *et*

al., 2011). Previous studies suggest that larger companies have a higher debt ratio (Table 1).

Profitability. Profitability is frequently measured as the return on assets or gross margin (Bessler *et al*., 2011). Most studies have found a negative relationship between profitability and debt (Table 1).

Liquidity. Liquidity is measured as the ratio of current assets to current liabilities. Most studies indicate an inverse relationship (Table 1).

Table 1

Results of Recent Studies on Firm-specific Determinants on Capital Structure

Author, publication year	Tangibility	Size	Profitability	Liquidity
Lemmon *et al.* (2006)	+	+	-	
Mazur (2007)	-	-	-	-
Delcoure (2007)	+	+	-	
Salawu and Agboola (2008)	+	+	+	
Ramlall (2009)	+	-		-
Nunkoo and Boateng (2010)	+	-	+	
Sbeiti (2010)	-	+	-	-
Sabir and Malik (2012)	+	+	-	+
Cuong and Canh (2012)	-	+	-	
Salehi and Manesh (2012)		+	-	
Saarani and Shahadan (2013)			-	-
Pecking-order theory	-	-	-	
Trade-off theory	+	+	+	+

Notes: "+" indicates a positive relationship with debt ratio; "-" indicates an inverse relation with debt ratio; blank – not significant or not researched in the particular study.

Overall, empirical results show mixed results on relationship between capital structure and firm-specific determinants. Extensive empirical research has been done, yet results are inconsistent.

Data and Methodology

The present study covers non-financial companies. The financial and real estate companies are excluded from the study due to their distinct balance sheet structure. Two samples of companies were used: annual data of 58 Baltic listed companies and annual data of 150 Latvian non-listed companies operating in the trade industry over the period 2005–2012.

The analysis utilizes the following variables:

- ratio of fixed assets to total assets (as a proxy for tangibility);
- return on equity (as a proxy for profitability);
- logarithm of total assets (as a proxy for size);
- current ratio (as a proxy for liquidity);
- short-term debt ratio;
- long-term debt ratio;
- total debt ratio.

The selection of variables is primarily guided by the results of previous empirical studies and the available data. The study uses not only the total debt ratio but also the long-term debt ratio and the short-term debt ratio, since any analysis of leverage determinants based only on total liabilities may miss the important differences between long-term and short-term debt (Sogorb-Mira, 2005).

Using the above defined variables, the following model is estimated for the sample:

$$LTD_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 SIZE_{it} + \beta_3 TANG_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}, \quad (1)$$

$$STD_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 SIZE_{it} + \beta_3 TANG_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}, \quad (2)$$

$$TD_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 SIZE_{it} + \beta_3 TANG_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}, \quad (3)$$

where:

LTD_{it} – long-term debt ratio of company *i* at time *t*;

STD_{it} – short-term debt ratio of company *i* at time *t*;

TD_{it} – total debt ratio of company *i* at time *t*;

$PROF_{it}$ – return on equity of company *i* at time *t*;

$SIZE_{it}$ – logarithm of total assets of company *i* at time *t*;

$TANG_{it}$ – ratio of fixed assets to total assets of company *i* at time *t*;

LIQ_{it} – current ratio of company *i* at time *t*;

ε_{it} – the error term.

The analysis is conducted using the correlation method (the Pearson correlation) and panel regression models.

The Pearson correlation ratio measures the degree and the direction of linear relationship between two variables. Correlation coefficient of +1 corresponds to a perfect positive linear relationship, coefficient of -1 corresponds to a perfect negative linear relationship, and 0 indicates no linear relationship between variables.

In order to estimate the panel regression model, two alternative methods were used: the fixed effects model and random effects model. The pooled regression may distort the

true picture of the relationship between leverage and firm–specific determinants across companies. The two most prominent models are the fixed effects model (FEM) and the random effects model (REM). In FEM, the intercept in the regression model is allowed to differ among individuals in recognition of the fact that each company may have some special characteristics of its own.

Empirical Results

Table 2 represents the mean value of variables included in the study. Non-listed companies use more long-term debt (difference of almost 20 percentage points) and short-term debt than listed companies (difference of 4.6 percentage points). Therefore, the mean value of total debt for non-listed companies is close to 50%, while listed companies operate with a much smaller ratio of 23.43%. One explanation might be that listed companies are usually larger and more stable; therefore they might have more funds and internal resources available.

As regards profitability, one can note that ROE is much higher for non-listed companies than for listed companies. However, one must take into consideration that non-listed companies are mostly companies with limited liability and can be founded with a very small equity capital. Thereby, a high ROE can be achieved with moderate earnings and low equity. In addition, listed companies are bigger on average, with more tangible assets and liquidity.

Table 2

Mean Values of Variables for Non-listed and Listed Companies, 2005–2012

Variable	Non-listed companies	Listed companies
LTD, %	33.44	13.58
STD, %	14.39	9.84
TD, %	47.84	23.43
ROE, %	14.51	0.69
SIZE	11.56	17.09
TANGIBILITY, %	38.46	46.28
LIQUIDITY	2.78	3.07

Table 3 provides the Pearson correlation matrix of the variables included in the study for non-listed companies.

Table 3

Pearson Correlation Matrix for Non-listed Companies, 2005–2012

	LTD	STD	TD	ROE	SIZE	TANG	LIQ
LTD	1						
STD	-0.070* (0.020)	1					
TD	0.875** (0.000)	0.422** (0.000)	1				
ROE	0.013 (0.660)	0.016 (0.593)	0.020 (0.510)	1			
SIZE	-0.175** (0.000)	-0.124** (0.000)	-0.219** (0.000)	0.119** (0.000)	1		
TANG	0.021 (0.482)	-0.080** (0.007)	-0.238** (0.000)	0.048 (0.108)	0.331** (0.000)	1	
LIQ	0.024 (0.423)	-0.082** (0.006)	-0.180** (0.000)	-0.028 (0.360)	-0.076** (0.012)	-0.196** (0.000)	1

**Correlation is significant at the 0.05 level*
***Correlation is significant at the 0.01 level.*

Based on the analysis of the correlation coefficients, one can conclude that:

- All debt ratios are negatively correlated with size.
- There is no correlation between profitability and debt ratios.
- Short-term debt and total debt are negatively correlated with tangibility and liquidity.
- Profitability is positively correlated with size and the size has a positive correlation with tangibility.
- There are negative correlations between liquidity and size, as well as tangibility.

In summary, larger non-listed companies use less debt and are more profitable. In addition, companies with less debt have more tangible assets and a higher current ratio.

Table 4 presents the Pearson correlation matrix for listed companies. Some differences (compared to non-listed companies) can be noted:

- Short-term debt and total debt have an inverse relationship with profitability.
- Tangibility is positively correlated with the long-term debt ratio and total debt ratio.

Differences can be explained as follows. The ratio of fixed assets to total assets is positively correlated with the long-term debt ratio; this might mean that listed companies

try to match their liabilities with their assets. In addition, an inverse relationship between short-term and total debt ratios and profitability means that more profitable listed companies use less debt.

Table 4

Pearson Correlation Matrix for Listed Companies, 2005–2012

	LTD	STD	TD	ROE	SIZE	TANG	LIQ
LTD	1						
STD	0.304** (0.000)	1					
TD	0.890** (0.000)	0.704** (0.000)	1				
ROE	0.019 (0.681)	-0.298** (0.000)	-0.128** (0.006)	1			
SIZE	-0.042 (0.366)	-0.125** (0.007)	-0.091 (0.050)	0.093* (0.045)	1		
TANG	0.289** (0.000)	0.057 (0.224)	0.242** (0.000)	-0.061 (0.187)	0.283** (0.000)	1	
LIQ	-0.179** (0.000)	-0.240** (0.000)	-0.248** (0.000)	0.024 (0.599)	-0.267** (0.000)	-0.272** (0.000)	1

**Correlation is significant at the 0.05 level*
***Correlation is significant at the 0.01 level.*

The results of the regression analysis of the long-term debt ratio are presented in Table 5. The results denote that independent variables explain the variance of the degree of the long-term debt ratio at 9.7% (FEM) and at 10.9% (REM) for listed companies, while at 2.2% (FEM) and 2.4% (REM) for non-listed companies. All four models are statistically significant. One can conclude that firm-specific determinants are more pronounced in the case of listed companies.

Coefficients of liquidity are not statistically significant for both listed and non-listed companies. In addition, profitability is not a significant determinant for non-listed companies as well. Company size seems a significant determinant of corporate leverage, especially in the case of non-listed companies (for example, regression coefficient for size is -2.5 in REM for listed companies, whereas it is -19.60 in FEM for non–listed companies).

Table 5

Regression Model Results – LTD, 2005–2012

	Listed		Non-listed	
	FEM	**REM**	**FEM**	**REM**
ROE	0.0629735 (0.000)	0.0583389 (0.000)	-0.0142902 (0.399)	-0.0105833 (0.533)
SIZE	-3.225147 (0.015)	-2.50727 (0.002)	-19.60435 (0.000)	-13.84198 (0.000)
TANGIBILITY	0.4678411 (0.000)	0.3477845 (0.000)	-0.3975364 (0.001)	-0.2201141 (0.054)
LIQUIDITY	0.0711036 (0.771)	-0.1695642 (0.378)	0.0667342 (0.828)	0.0786654 (0.789)
Number of observations	464	464	1103	1103
Number of companies	58	58	150	150
R^2	0.0976	0.1091	0.0223	0.0239
Prob>F (FEM) Prob>chi2 (REM)	0.000	0.000	0.000	0.000

Table 6 presents the results of the regression analysis of the short-term debt ratio. Profitability, size, tangibility and liquidity explain the variance of the degree of the short-term debt ratio at 9.6% (FEM) and 14.5% (REM) for listed companies, while at 2.1% (FEM) and 2.7% (REM) for non-listed companies. Once again, all four models are statistically significant and R^2 is higher in models of listed companies.

Coefficients of profitability and tangibility are not statistically significant for non-listed companies, whereas tangibility regression coefficient is positive in the case of listed companies. Coefficient of size is more negative for non-listed companies, similar to the previous results of the long-term debt. For listed Baltic companies all four determinants – profitability, size, tangibility and liquidity – are statistically significant and can explain the variance of the degree of short-term debt ratio.

Table 6

Regression Model Results – STD, 2005–2012

	Listed		Non-listed	
	FEM	**REM**	**FEM**	**REM**
ROE	-0.0493884 (0.000)	-0.0523834 (0.000)	0.008061 (0.544)	0.0100066 (0.441)
SIZE	-3.532439 (0.000)	-2.058906 (0.000)	-7.826618 (0.001)	-3.649717 (0.001)
TANGIBILITY	0.1519147 (0.003)	0.0760808 (0.027)	-0.0688768 (0.478)	-0.0956271 (0.185)
LIQUIDITY	-0.347349 (0.029)	-0.4549283 (0.000)	-0.3393568 (0.0159)	-0.4781305 (0.016)
Number of observations	464	464	1103	1103

Number of companies	58	58	150	150
R^2	0.0955	0.1449	0.0207	0.0269
Prob>F (FEM) Prob>chi2 (REM)	0.000	0.000	0.0043	0.0004

The firm-specific determinants explain the variance of the degree of total debt at 9.5% (FEM) and 11.8% (REM) for listed companies, while at 4.2% (FEM) and 4.3% (REM) for non-listed companies (Table 7). Similar to previous results, all models are significant and a higher R^2 is observed for models of listed companies.

Coefficients of profitability are not statistically significant for both sets of companies, and almost the same can be stated for liquidity (coefficient of liquidity is statistically significant only in REM for listed companies). Tangibility is statistically significant with the exception of REM for non-listed companies, and these regression coefficients are negative for non-listed companies, whereas size is significantly more important determinant of leverage for non-listed companies.

Table 7

Regression Model Results – TD, 2005–2012

	Listed		**Non-listed**	
	FEM	**REM**	**FEM**	**REM**
ROE	0.0135852 (0.419)	0.0075499 (0.658)	-0.0062292 (0.757)	-0.0008077 (0.968)
SIZE	-6.757586 (0.000)	-4.808475 (0.000)	-27.43097 (0.000)	-18.224 (0.000)
TANGIBILITY	0.6197558 (0.000)	0.4469711 (0.000)	-0.4664132 (0.002)	-0.2566291 (0.053)
LIQUIDITY	-0.2762454 (0.361)	-0.5880437 (0.000)	-0.2726226 (0.455)	-0.3179296 (0.355)
Number of observations	464	464	1103	1103
Number of companies	58	58	150	150
R^2	0.0954	0.1177	0.0418	0.0434
Prob>F (FEM) Prob>chi2 (REM)	0.000	0.000	0.000	0.000

To sum up, based on multiple regression analysis of panel data, several conclusions can be made:

- Size is a statistically significant determinant of long-term debt, short-term debt and total debt for both listed and non-listed companies. One must note that regression coefficients for non-listed companies are significantly higher. The negative sign of the coefficients indicates that larger companies use less debt, especially in case of non-listed companies. This might mean that larger companies have more internal resources available and do not require external debt.

- Tangibility is a statistically significant determinant of all types of debt ratios for listed companies, whereas asset tangibility is negatively correlated with long-term debt and total debt for non-listed companies. A positive relation for listed companies can indicate that companies try to match their assets with liabilities, and that high tangibility is associated with a higher level of collateral available for the creditors, therefore more debt is used.
- Profitability shows mixed results. Return on equity is not a statistically significant determinant of leverage for non-listed companies; however, there is a positive relationship with long-term debt and a negative relationship with short-term debt for listed companies.
- Current ratio has only negative correlations with the short-term debt and with total debt of listed companies (REM). This is logical, since in the calculation of the current ratio includes short-term liabilities. If short-term liabilities increase then current ratio decreases, and vice versa.

The leverage of non-listed companies is determined by size, tangibility and liquidity. Larger non-listed companies use less debt, their liquidity increases with a decrease in the short-term debt and companies with more fixed assets employ less external debt.

The leverage of listed companies is determined by size, tangibility, liquidity and profitability. Larger listed companies use less debt, and companies with more tangible assets use more debt. Liquidity decreases with an increase in the short-term debt. Return on equity of listed companies grows with an increase in the long-term debt; however it decreases with an increase in the short-term debt.

Conclusions

This paper investigates the main determinants of capital structure of companies. Using panel data analysis for a set of 150 non-listed and 58 listed companies, the author concludes that the company leverage is determined by specific characteristics such as profitability, size, asset tangibility and liquidity.

- Debt ratios decrease with the increase in size of both listed and non-listed companies.
- Tangibility is positively correlated with leverage for listed companies, whereas a negative relationship can be found for non-listed companies.
- Liquidity is a statistically significant determinant of short-term debt for listed and non-listed companies.
- Profitability is not a statistically significant determinant for non-listed companies; however, return on equity is positively correlated with long-term debt and negatively correlated with short-term debt for listed companies.

Overall, one can conclude that firm-specific determinants are correlated with corporate financial leverage but these relationships depend on the maturity of debt and company type (listed or non-listed).

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THE ASSESSMENT OF SUBJECTIVE WELL-BEING IN THE EU

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Abstract

The aim of the paper is to analyse the level of subjective well-being in different EU countries.
The main findings in the present paper – the assessment of subjective well-being is becoming more and more important across EU countries. There have been several researches done to evaluate the level of subjective well-being in communities and municipalities. The studies are closely related to social inclusion and citizen engagement processes leading to a more democratic society. The research showed that there are significant changes regarding the assessment of subjective well-being in different EU countries – every nation understands well-being differently. For some nations, well-being is related to material goods, while for others – to relationship within the society.
Keywords: *subjective well-being, municipalities, citizen engagement, social inclusion, SPIRAL methodology.*

Introduction

The concept of well-being has always been important – every society is trying to find the best possible solution to ensure its well-being. Traditionally, the nation's well-being is measured by macroeconomic indicators such as GDP or GNP. However, well-being is more than accumulation of material wealth; it is also the satisfaction of everyday life, as well as prospects of improving the living conditions in the future. The fact that well-being has also dimensions, other than economic ones, could be supported by the fact that there is significant emigration from countries with positive GDP growth. It means that there are other factors, which are important for individual's well-being. Well-being is the most relevant for defining the indicators of impaction and the level of societal progress. However the concept of well-being is not clearly measurable because it is not easy to evaluate the level of living (Noordhoff, 2008). The indicators of well-being

could be divided into subjective and objective ones. The objective indicators could be some measurable components or factors of well-being, *e.g.* incomes, consumption, capital, investment, savings, stocks, import-export balance and other different economic aspects that are targets of every country and also individuals in making strategies for future actions (Blackman, 2001). There are components of well-being that cannot be measured directly by objective indicators and need subjective ones, which in their turn, are built from the point of view of persons themselves and require specific methods. So, there are more and more indicators that social and economic science should develop and estimate. There are still factors which are not explained; however the influence is obvious (Digby, 1998).

Subjective measures of well-being are the measures, which are based on questions like: "Taking all things together, how happy would you say you are these days – very happy, pretty happy, or not too happy?" (Dolan et al., 2007; Frey & Stutzer, 2002; Layard, 2005).Subjective measures of well-being have become a subject of heated discussions in the academy and beyond. One reason is that they are frequently presented as substitutes for, or complements to traditional income-based economic welfare measures and to indicators inspired by the capability approach (Kesebir & Diener, 2008). Indeed, to encourage the use of subjective measures for public policy purposes, proponents have advocated National Well-Being Accounts (NWBAs), which track population-level scores on subjective measures over time (Diener & Seligman, 2004; Diener, 2006; Kahneman et al., 2004).

Taking into consideration the aforementioned facts, the aim of the paper is to analyse the level of subjective well-being in different EU countries.

In order to achieve the aim, the authors of the present paper set the following tasks:

- To review theoretical background for researching subjective well-being.
- To assess different methods of measuring subjective well-being.
- To compare and analyse results gained using SPIRAL methodology for evaluation of subjective well-being in different EU countries.

The research methods used: scientific literature studies about methodologies for evaluation of subjective well-being, several stages of focus group discussions organized in nine EU countries (147 focus groups), statistical data analysis, SPIRAL methodology developed by experts from the Council of Europe in the context of social cohesion for evaluation of subjective well-being, hypothesis test in order to find out if there are differences in the assessment of subjective well-being among countries.

Theoretical Framework

Methodology of measuring subjective well-being

In recent years subjective well-being has been gaining importance as an indicator of economic and social progress in the industrialized world. The growing interest in subjective well-being is related to the increasing gap found between the information contained in aggregated data regarding objective determinants of well-being (like a country's GDP) and the laymen's own evaluation of it (Stiglitz et al., 2009). Most studies on the relationship between economic standing and subjective well-being have used income as an indicator of economic standing. These studies usually report a significant positive impact of income on subjective well-being (e.g., Easterlin, 2001; Frey & Stutzer, 2002; Larson, 1978). Yet, income seems to account for only a small part of the variation in subjective well-being (Diener et al., 1993; Pinquart & Sörensen, 2000). Recent studies suggest that measures of economic standing, other than income, might be more useful for understanding its relationship with subjective well-being (Christoph, 2010; Diener, Harter, & Arora, 2010; Headey, Muffels, & Wooden, 2008; Howell & Howell, 2008; Warren & Britton, 2003). These studies highlight the important role of socioeconomic status (SES), deprivation, and wealth, among other indicators determining economic standing.

There are a number of theories and ways of measuring subjective well-being. In particular, questions on subjective well-being are increasingly used in population surveys, and it is suggested that a new 'Science of Happiness' is emerging, which aims to measure the subjective well-being and identify the main factors affecting it, as well as to quantify their relative importance. There is a rapidly growing body of interdisciplinary research on the determinants of subjective well-being (Dolan, Peasgood, & White, 2007; Frey & Stutzer, 2002; Huppert, Baylis, & Keverne, 2005; Layard, 2005). In addition, there have been ongoing debates about whether happiness can be measured, whether it should be measured, how it should be measured and what are the factors affecting it (Boniwell, & Ayers, 2013).

Although there are critiques of the idea that subjective well-being can be measured and compared among people, there is strong evidence in support of the validity of such measures. For instance, research in the field of neuroscience suggests that there is a correlation between the subjective feelings that people report in surveys and brain activity patterns (Davidson, 2000; Davidson et al., 2000). Other examples cited in the literature include the work by Di Tella, MacCulloch, and Oswald (2003), Bray & Gunnell (2006), suggesting that there is strong evidence that the rises and falls in suicide rates move in the opposite direction to changes in general levels of happiness (Blanchflower & Oswald, 2004; Powdthavee, 2007). Nevertheless, there is ongoing debate on the most appropriate and valid measure of well-being, and it has long been argued that there are different types and dimensions of subjective well-being. For

instance, Dolan *et al*. (2006) present detailed discussions of different concepts of well-being and classify them in the following categories: 'Preference Satisfaction' based on the fulfilment of desires; 'Flourishing Accounts', based on the satisfaction of certain psychological needs; 'Hedonic Accounts' based on how people feel and 'Evaluative accounts' based on how people think they feel. A more recent review is presented by Layard (2010).

Geographical studies of subjective happiness and well-being

Although the above-mentioned studies are undoubtedly useful in providing insights into what are the types of cities and regions that would increase subjective well-being, there has been very little research with a regional science or city or local area perspective that defines the quality or utility of life on the basis of subjective well-being data from social surveys. It is only relatively recently that the literature on subjective well-being has begun to take serious account of the role of place, local community and social cohesion (e.g. Blanchflower & Oswald, 2009; Brereton, Clinch, & Ferreira, 2008; Clark, 2003; Clark, Kristensen, & Westergård-Nielsen, 2009; Luttmer, 2005; Powdthavee, 2007; Propper et al., 2005; Putnam, 2000, Ballas, 2008; Ballas et al., 2007).

The number of studies on subjective measures of subjective well-being with a geographical dimension is steadily growing. Recent research by Ballas and Tranmer (2012) combined the British Household Survey with census data to explore the levels of subjective well-being at individual, household, district and regional level. Their findings suggested that while most of the variation in subjective well-being is attributable to the individual level, some variation in these measures was also found at the household and area levels. However, this geographical variation in happiness was not found to be statistically significant when controlling a number of pertinent socio-economic and demographic variables. Nevertheless, it was also suggested that the lack of statistical significance of place at the district level may have been due to the small sample size in the geographical and social context.

Aslam and Corrado (2011) also present a regional study on subjective well-being in Europe and find a statistically significant relationship between subjective life satisfaction and regional factors.

Keul and Prinz (2011) also apply the geographic information system (GIS) to the analysis of subjective well-being in Salzburg, Austria. Ballas (2010) presented a GIS-based spatial micro simulation approach aimed at estimating subjective well-being for small areas, while the more recent work by Higgins, Campanera, and Nobajas (2012) is also of relevance. They examined the geographical distribution of subjective well-being at the intra-urban scale, exploring geographical patterns of key indicators for London boroughs by using cluster analysis of both objective and subjective measures. Brereton et al. (2008) presented an even more geographically disaggregated analysis of well-being

by using GIS based techniques to explore the impact of location-specific factors upon life satisfaction and well-being; their work suggested that living in Dublin results in lower subjective well-being scores, compared to living in the countryside. Brereton, Bullock, Clinch, and Scott (2011) built on this work to explore subjective well-being in rural areas in Ireland and their results suggested that there is a consistently high life satisfaction in rural Ireland, whereas more recently Mitchell (in press, 2013) explored the relationship between green spaces and measures of health in Scotland and found that although greener neighbourhoods do not seem to be healthier "people who actually visit and use green spaces, whether for exercise, or just to get away for a while, do seem to have better mental health and more life satisfaction, all else being equal" (Mitchell, 2013). The recent work by Wells and Donofrio (2011) where they explore links between urban planning, the natural environment and public health measures in the US, is also of relevance.

In 2000, the Council of Europe adopted the Social Cohesion Strategy; it was revised in 2004, 2007 and 2010. It defines social cohesion as society's capacity to ensure the well-being of all its members by minimizing disparities and avoiding polarization, to manage differences and divisions, and to acquire the means of ensuring the social welfare of all its members. In the period 2002–2005, the first Methodological Guide for Designing Concerted Social Cohesion Indicators was developed with different services of the Council of Europe and various governments, laying down the conceptual and methodological groundwork of social cohesion. Following its publication in 2005, collaboration with the Congress of Local and Regional Authorities took place in the pilot town of Mulhouse and in many other towns. Several applications have been carried out at local level in specific geographical areas (communities, neighbourhoods, municipalities, regions) and institutions (businesses, schools, hospitals, public administrations, etc.). Today stakeholders from almost 20 countries use the Societal Progress Indicators for the Responsibility of All (SPIRAL) methodology to measure well-being of the society (New Strategy and …, 2010). The SPIRAL methodology, recently developed by the experts from the Council of Europe under the supervision and inspiration of Samuel Thirion, is a way to define and measure well-being from the subjective point of view of the persons themselves. It is one of fundamental values in society's progress towards improved capacity to ensure the well-being of all, through the development of co-responsibility. This methodology can ensure such progress because it was developed jointly by inhabitants and other social stakeholders at local level by tying in with the regional, national, European and global levels. A community of experimenters (governments and other local and regional players, companies, hospitals, schools, associations, NGOs, researchers, etc.) was involved in the development of this methodology. It expanded little by little in order to produce the methodology and make it available to as many people as possible (Council of Europe, 2008).

The SPIRAL methodology was also developed and approbated in 8 different European municipalities within URBACT II programme project "TOGETHER for Territories of

Co-responsibilities" – Salaspils (Latvia), Mulhouse (France), Braine-L'alleud (Belgium), Pergina (Italy), Kavala (Greece), Covilha (Portugal), Botkyrka (Sweden), Debica (Poland). Several publications have discussed the results of the SPIRAL methodology (Jēkabsone *et al*., 2013; Grantiņš et al., 2012, 2011). The research is going on and different aspects of the issue are examined.

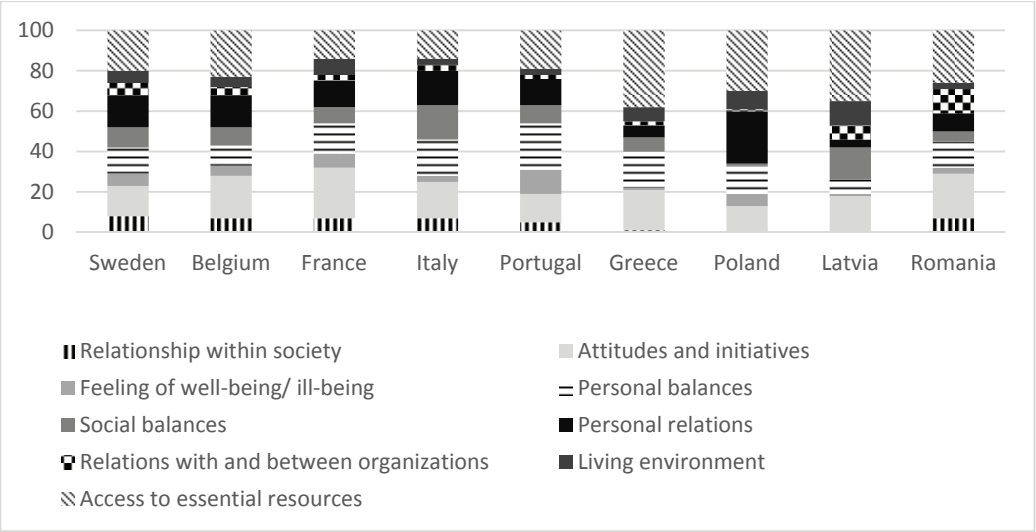
Research Results and Discussion

The SPIRAL methodology is used for building indicators of well-being with the help of citizens themselves, as well as preparing and launching a Co-responsibility Action Plan from these indicators by drawing on the coordination of the Local Support Group. The main participant in evaluation of well-being is population of community that is represented by the Local Support group, which is formed by leaders of different NGOs, interest and religious groups. The method has the following advantages:

- Respondents not only answer questions formulated beforehand, but they can also set new indicators, which are important for well-being in the municipality.
- Respondents who represent the population of municipality participate until the Local Action plan is prepared based on indicators of well-being.
- Population is fully representative because of homogenous groups which participate in making the indicators of well-being (The URBACT II Local Support Group Toolkit..., 2010).

The given answers to the open-ended questions like "What is well-being for you", "What is ill-being for you?", "What do you do or could do for the well-being?" provide the indicators and their evaluations, which are the main outputs of the methodology. The indicators are divided in 8 main groups: 1. access to essential resources; 2. living environment; 3. relations with and among organizations; 4. personal relations; 5. social balances; 6. personal balance; 7. feelings of well-being/ ill-being; 8. attitudes and initiatives; 9. relationships within the society (URBACT Guide to Local Action Plans, 2009). The software designed by the Council of Europe updates the results of findings by a homogenous group; the experts insert the citizens' data on written criteria by allocating them in the right indicator group and giving the estimates.

Using the SPIRAL methodology, the research was conducted in 9 different municipalities of EU countries during 2011 and 2012. The research was carried out among 147 focus groups (about 16 focus groups per municipality). The results of this research are shown in Figure 1.



Source: The results of the SPIRAL methodology gained from 147 focus group meetings organized in 2011–2012 (from 14 014 answers)

Figure 1. Repartition of the subjective well-being dimensions per country in EU countries, 2012, %

Further it was decided to analyse the results of the research on subjective well-being in the EU countries in view of GDP per capita that is one of the most popular indicators of objective well-being.

According to the data from the Eurostat database, GDP per capita in Sweden, Belgium, France and Italy is above the EU average. Thereby, the level of GDP per capita in Portugal, Greece, Poland, Latvia and Romania is beyond the average EU level (see Table 1).

Table 1

GDP per Capita in PPS in EU Countries in 2012, %

Sweden	Belgium	France	Italy	EU28	Portugal	Greece	Poland	Latvia	Romania
126	120	109	101	100	76	75	67	64	50

Source: Eurostat database

In order to carry out a more profound research, it was decided to make the hypothesis testing (difference between means) to find out if there is some correlation between dimensions of subjective well-being and the level of GDP per capita in the EU. The subjective well-being dimensions in countries with higher level of GDP per capita actually differ from countries with lower level of GDP per capita.

The null hypothesis was formulated as follows: there is no difference on average among the EU countries on well-being dimensions:

$$Ho: |\mu_1 - \mu_2| = 0 \quad (1)$$

Alternative hypothesis: there is a difference on average in well-being dimensions between countries where GDP per capita is above and beyond the average EU level:

$$H1: |\mu_1 - \mu_2| \neq 0 \quad (2)$$

The calculations were indicative of a significant difference among the countries with lower and higher level of GDP per capita in such subjective well-being dimensions as 'Access to Essential Resources' and 'Relationship within the Society' (see Table 2).

Table 2

The Results of Hypothesis Testing (difference between means), α=0.05

Well-being dimension	Access to essential resources	Living environ-ment	Relations with and among organizations	Personal relations	Social balances	Feeling of well-being/ ill-being	Attitudes and initiatives	Relationship within the society
Outcome of a hypothesis testing	**Reject Ho**	**Do not reject Ho**	**Do not reject Ho**	**Do not reject Ho**	**Do not reject Ho**	**Do not reject Ho**	**Do not reject Ho**	**Reject Ho**
Interpretation	The results of well-being dimension "Access to essential resources" significantly differ among EU countries grouped by GDP per capita	The results of well-being dimension "Living environment" don't significantly differ among EU countries grouped by GDP per capita	The results of well-being dimension "Relations with and among organiza-tions" don't significantly differ among EU countries grouped by GDP per capita	The results of well-being dimension "Personal relations" don't significantly differ among EU countries grouped by GDP per capita	The results of well-being dimension "Social balances" don't significantly differ among EU countries grouped by GDP per capita	The results of well-being dimension "Feeling of well-being/ ill-being" don't significantly differ among EU countries grouped by GDP per capita	The results of well-being dimension "Attitudes and initiatives" don't significantly differ among EU countries grouped by GDP per capita	The results of well-being dimension "Relationship within society" don't significantly differ among EU countries grouped by GDP per capita

Source: Authors' calculations based on the results of research of the SPIRAL methodology gained from 147 focus group meetings organized in 2011–2012 (from 14 014 answers)

The subjective well-being dimension 'Access to Essential Resources' concerns material circumstances. It relates to the basics of daily life, incl. food and shelter, clothes, education, work, money and information, and contains eleven different categories. Examples of responses to the questions that fall into this category include: "a clean home"; "education you are happy with"; "having a job close to home"; "good health services", while in response to the ill-being question – "not able to find a job"; "bills"; "lack of money"; "no computer". Whereas the subjective well-being dimension 'Relationship within the Society' revolves around the relationships, which shape a citizen. It is the

'social equilibrium' and has eleven sub-categories, which focus on social relationships like politeness and respect among people, fairness, sharing and solidarity, inclusion and exclusion along with peace and violence. Examples of responses – “able to help others”; “supporting the weakest”; “live securely”; “everyone is recognised”; while on the ill-being side – “lack of respect”; “feel excluded”; “no security”; “live with violence”; “mobbing”; “to be discriminated against”; “racism”.

The research is indicative of the fact that societies in the EU countries with lower level of GDP per capita tend to more emphasise material circumstances, like housing, employment, personal finances, and less the relationships within the society – inclusion, tolerance, solidarity, whereas the societies in the EU countries with higher level of GDP per capita more associate well-being with tolerant relationships with the society, social inclusion and gender equity, less lightening the material part of well-being (house, job, food, clothes).

Limitations

In all cases the SPIRAL methodology was approbated at local level instead of national level. This factor doesn’t allow generalizing the results to the entire country. The main criteria for choosing certain municipalities was the willingness of the municipality to approbate the methodology in order to improve the well-being in society and dialogue with society, whereas the socio economic indicators of municipalities differ from certain country indicators, e.g. Mulhouse Municipality is one of the poorest municipalities of France, while Salaspils is one of the most developed municipalities of Latvia (Bloomfield, 2012).Given that the research focuses on subjective well-being, including also general feelings of well-being, which could represent general presumptions at national level, it should be taken into account that the researches in the municipalities were done using representative sample.

Conclusions

1. Subjective well-being, as an indicator of economic and social progress, has been gaining importance in the industrialized world in recent years. The growing interest in subjective well-being is related to the increasing gap between the information contained in aggregated data regarding objective determinants of well-being (like a country’s GDP) and the laymen’s own evaluation of it.
2. There has been very little research done with regional science or city or local area perspective that defines quality or utility of life on the basis of subjective well-being data obtained from social surveys. Relatively recently the literature on subjective well-being has begun to take serious account of the role of place, local community and social cohesion.

3. For the last decade, a new SPIRAL methodology has been developed to evaluate the subjective well-being at local level. The SPIRAL methodology was initiated by the Council of Europe. It is one of the instruments for the implementation of the Social Cohesion plan. This methodology was approbated in 9 different municipalities of the EU, providing representative data on indicators of subjective well-being.
4. The research is indicative of the fact that societies in the EU countries with lower level of GDP per capita more emphasise material circumstances like housing, employment, personal finances, while less the relationships within the society – inclusion, tolerance, solidarity. The societies in the EU countries with higher level of GDP per capita more associate well-being with tolerant relationships with the society, social inclusion and gender equity, less highlighting the material part of well-being (house, job, food, clothes).

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EVALUATION OF METHODS OF MEASURING THE QUALITY, AS THE DETERMINANT OF COMPETITIVENESS IN ECONOMIC AND SOCIOLOGICAL ASPECTS

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Abstract

The aim of this article is to introduce two different concepts of measuring the quality, two different views of quality as the factor of competitiveness. The first one, known as conceptual, is based on qualitative description of things, interactions, relationships, structures and phenomena observed, for instance, in abrupt changes of their functioning, leading to verbal representations of systems. It is especially used to measure the service quality.
The second – mathematical, also known as formal, consists in representing descriptions of some areas and levels in a formalised language of mathematics leading to the development of analytic, stochastic, statistical and simulation models. It is possible to name these two points of view as economic and social aspects of measuring the quality.
Keywords*: competition, measure, quality, determinant, methods.*

Introduction

In the world of contemporary global economy the quality becomes one of the most important factors and means of assessing company's performance on the market, and it is also perceived as a determinant of its development. The lack of quality means elimination from the market and loss of market position in the future.

The measurement of quality can be interpreted as a phenomenon of seeking appropriate methods fitted to specific types of services. This statement can be regarded as extremely important to continue researching the reliable methods which, from the economic and sociological point of view, could became the part of a practice. The purpose of this

article is to inspect the methods and apply certain measurement criteria. There is also a practical side to the service quality on the concrete example – the hotel service.

The article presents and tries to introduce two different concepts of measuring the quality, two different views of quality as the factor of competitiveness (conceptual and mathematical). The analyses conducted in this article are mostly theoretical and based on scientific literary output.

Competition and Factors Influencing Competitiveness

Very often competitiveness is identified with price (Lombana, 2006: 34). However, the competition policy is just as concerned with quality as with price. While the importance of quality is undisputed and quality issues are mentioned pervasively in competition agency guidelines and court decisions, there is no widely-agreed framework for analysing it, and it often renders its treatment superficial. There are a number of reasons why, in practice, courts and competition authorities rarely analyse quality effects as rigorously as they analyse price effects. First, quality is a subjective concept and therefore much harder to define and measure than prices.

In addition, microeconomic theory offers little help in predicting how changes in the level of competition in a market will affect quality, and it is usually up to empirical analysis to determine how quality will change in response to varying degrees of competition in the context of particular markets.

Given difficulties in terms of the evaluation of quality factors, particularly in quantitative assessment, competition agencies end up using qualitative tools such as customer surveys and interviews, to assess quality where necessary. While experience with the implementation of quantitative econometric techniques is rather limited, they may become more readily applicable and widely used in the future. At the level of competition enforcement, the role and use of quality is well-established as a factor in defining the boundaries of the relevant market as well as in assessing the legality of horizontal and vertical restraints. In contrast, the role of quality effects in merger controls, and in particular, trading off between quality and price effects, remains to be one of the most vexatious – and still unresolved – issues (OECD staff, 2013: 12)[1].

[1] This opinion represents the consensus view of the Competition Committee. It encapsulates key points from the roundtable discussion. The OECD Competition Committee discussed the role and measurement of quality in competition analysis in June 2013. This document contains an executive summary of that debate and the documents from the meeting: an analytical note by the OECD staff and written submissions: Australia, Canada, Chile, the European Union, Indonesia, Japan, Mexico, Portugal, the United Kingdom, Ukraine, the United States and BIAC.

Since the concept 'competitiveness' became popular at the beginning of the 90s, a number of its definitions have appeared (Lubas & Piasny, 2012: 200). There are many points of view on competition. Very often competition is identified with price, product quality, resource productivity, production costs or competitive advantage itself (Lomban, 2006: 34). These synthetic approaches to competitiveness based on single-factor considerations, such as the approach to company competitiveness as greater production efficiency (Ambastha &Momaya, 2004: 26), supplying products and services at a more attractive price (Dwyer & Kim, 2003: 5), are rather fragmentary and difficult to apply in practice (Flak & Głód, 2012: 40). J. Owen has an interesting and slightly controversial view on competitiveness. In his opinion, the competitive advantage is not based on any abstract concept of absolute perfectness. To get competitive advantage one must simply be less incompetent than its competitors (Owen, 2003:71). However, in practice, one does not always gain the advantage just because he/she is more competent. John Kay rightly notices that competitive advantage does not result from outstanding capabilities of a company but from its domination or more favourable position in the market (Kay, 1996: 42), since in the market you can encounter enterprises, which take advantage of natural monopoly or benefit from certain market limitations. One must agree here with an accurate statement that the capability can be outstanding only when it concerns the feature, which other companies lack. However it is not enough for the feature to be outstanding only. It must also be stable and exclusive property of a company (Dunbar & McDonald, 2003: 262).

The Level of Quality as a Fundamental Aspect of Competition

It is important to remember that the products offered on the market are frequently compositions of tangible and less tangible elements; therefore, while choosing the measurement criteria, it is necessary to take this heterogeneity into consideration (Lubas, 2005: 90).

In the marketing strategy for a service the question of **quality** is very important, i.e. to what extent the expectations of buyers are met. Buyers' expectations in terms of service quality are formed by such elements as prior experiences, advertising and opinions of other buyers of a given service (Mazur, 2001: 84).

Service quality is considered as a critical dimension of competitiveness (Shahin & Samea, 2010: 1). It is considerably more difficult to measure the level of service quality

than the quality level of products. A service company should keep observing the quality of services provided and maintain the highest level possible[2].

From the observation of customer behaviour it follows that they are guided by the following criteria in assessing the quality of various services (Pluta-Olearnik, 1993: 56):

1) **Service accessibility**, location and opening hours of outlets, as well as time to wait for the service to be provided.
2) **Information on company services** – accessible and clearly formed.
3) **Competence**, professional expertise of service providers, their training.
4) **Politeness** – polite manners and behaviour towards customers.
5) **Trust** – the company and its staff are reliable, they care for their customers' business.
6) **Reliability** – the services are thoroughly provided.
7) **Responsibility** – service providers respect the buyers' expectations and take into consideration their remarks; they act quickly and efficiently.
8) **Safety** – the service is devoid of risk elements.
9) **Type of material means used** – tangible assets, elements of service visible to buyers (state of the outlet, its equipment) must correspond with their professional use.
10) **Knowledge of buyers' needs** – proper market segmentation and needs identification.

The topic of service quality is taken up very often in numerous works devoted to the theory and practice. Over the years there arose numerous synthetic descriptions of the course and formation of quality, which made it possible to prepare models presenting interdependencies and relations between the elements of the process of service provision. It is impossible to quote all those examples in such a brief article, but it is certainly worth suggesting some solutions based on the existing, well-known ones. One can omit the SERVQUAL quality model, based on five gaps between the quality expected and the quality realized, as this dimension has already been thoroughly studied

[2] Service quality is an important subject in both public and private sectors, in business and service industries (Zahari et al., 2008). It is the extent to which a service meets or exceeds customer needs and expectations (Lewise & Mitchell, 1990; Dotchin & Oakland, 1994a; Asubonteng et al., 1996: Wisniewiski & Donnelly, 1996; Seilier, 2004; Zahari et al., 2008). During the past two decades, service quality has become a major area of attention to practitioners, managers and researchers because of its strong impact on business performance, lower costs, return of investment, customer satisfaction, customer loyalty and gaining higher profit (Leonard & Sasser, 1982; Cronin & Taylor. 1992; Gammie, 1992; Hallowell, 1996; Chang & Chen, 1998; Gummesson, 1998; Lasser et al., 2000; Newman, 2001; Sureshchander et al., 2002; Seth & Deshmukh, 2005). The rapid development and competition of service quality, in both developed and developing countries has made it important for companies to measure and evaluate the quality of service encounters (Brown & Bitner, 2007).

and presented by Prof. J. Garczarczyk (Garczarczyk, 2006: 97), among others. An interesting approach is E. Gummensson's approach to partial qualities, where quality is investigated on the basis of a 4Q process which consists of the following elements: project, performance, delivery and relation (Otto, 2004: 116) (Figure 1).

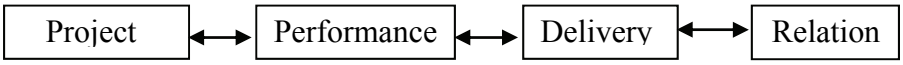

Fig. 1. Gummensson's model of partial qualities

Source: Lubas, B., Przybytniowski, J. Determinants of the Quality Management System Formation for Insurance Services in Poland and in the World /w:/ Sustainable Enterprises of the Future, Sustainable Enterprises of the Future, w: Sustainable Enterprises of the Future, Robert Morris University, Pittsburgh Pennsylvania, USA, 2009, pp. 234–242.

All stages of the process presented in the model are strongly interrelated and the quality of each stage has an impact on the others. It is worth looking into which elements of service constitute crucial attributes of the quality of this service, and then assign them to specific groups of the Gummenson's model.

According to George Phillip, "....it focuses on one of the most widely used service quality measurement scales, SERVQUAL, and looks at some of the areas of concern, which have recently been raised regarding its viability as a comprehensive measurement tool for the service industry as a whole. While acknowledging the significant contribution this model has made, it is suggested that it does not go far enough – the dimensions of SERVQUAL do not adequately address some of the more critical issues associated with the assessment of individual services" (Phillip & Hazlet, 1997: 260).

In place of the SERVQUAL scale, a model with hierarchical structure that is based on three main levels of attributes – pivotal, core, and peripheral (P-C-P), is proposed. This P-C-P model can span any service sector because a skeletal framework is proposed within which to consider respective services. The authors are currently in the process of using this model for the empirical analysis of the quality of information, which is provided by government bodies to the business community.

Social Indicators and Quality

During the last three decades subjective human well-being has been the subject of numerous studies, developing theoretical models and empirical measures, describing and comparing levels and changes of well-being for various populations and suggesting explanations for these findings. The empirical correlates and explanatory factors of satisfaction as an overall indicator of general subjective well-being are at the centre of a research field that during recent years has attracted much interest and attention all

around the world. The whole of these observations are connected with the last decision about the product in the opinion of customers (Noll, 2002: 11).

Using objective indicators starts from the assumption that the conditions for decision-making can be judged to be favourable or unfavourable by comparing real conditions with normative criteria like values, goals or objectives. In contrast, the use of subjective social indicators is based on the premise that a product, in the final instance, must be perceived and judged by individual citizens. One of the Scandinavian researchers' concerns "with an approach based on people's own assessment of their degree of satisfaction is that it is partly determined by their level of aspiration"[3]. Similar conclusion was made by L. Buller based on the research during the internal audit at the State Agency of Abroad Investments (Buller, 1999: 24).

In addition to general doubts concerning the use of subjective indicators, questions have been raised concerning the validity and reliability of this kind of information. However, there is not much reason to believe that subjective indicators are less valid and reliable than other survey data, which always are affected by measurement errors: "Subjective indicators measure, what they ought to measure and they react sensitive to societal developments" (Habich & Zapf, 1994: 30).

Nowadays, from a sociological point of view, the overall consensus of opinion is to base measurement on both objective and subjective indicators, given the fact that "similar living conditions are evaluated quite differently, e.g. people in bad conditions frequently are satisfied and privileged persons may be very dissatisfied" (Zapf, 1984: 13).

Economic Quantities

It is not enough to use quantitative modelling for describing economic phenomena and processes in purely economic categories. Economic categories perceived from the point of view of quantitative modelling represent qualitative and quantitative properties. Qualitative categories may obviously describe properties and characteristics of phenomena as well as quantitatively characterised processes, this depending solely on whether the characteristics or properties described by these categories are in fact measurable. In such a case, one may claim these categories to be quantities (Rosłanowska-Plichcińska & Grudzewski, 2013:5).

The development of economic theories has implied that there are economic categories which, first and foremost, constitute quantities, and that they only exist because they can be measured. In this respect, the relationships between primary and secondary categories may be described in a fairly explicit manner (Rosłanowska-Plichcińska & Grudzewski, 2013: 5).

The measures used in economics are physical measures, nominal price value measures and fixed price value measures. These measures differ from one another in the variables they measure and in the variables excluded from measurements. The measurable variables in economics are quantity, quality and distribution. By excluding variables from measurement it is possible to focus the measurement better on a given variable, yet, this means a more narrow approach.

Table 2 was compiled to compare the basic measurement types. The first column presents the measure types, the second the variables being measured, and the third column gives the variables excluded from measurement. The measurable variables in economics are quantity, quality and distribution. Measuring quantity in economics follows the rules of measuring in physics. Quality as a variable refers to qualitative changes in the production process. Qualitative changes take place when relative of different constant-price input and output factors alter. Distribution as a variable of production refers to a series of events in which the unit prices of constant-quality products and inputs alter causing a change in income distribution among those participating in the exchange. The magnitude of the change in income distribution is directly proportionate to the change in prices of the output and inputs and to their quantities. Productivity gains are distributed, for example, to customers as lower product prices or to staff as higher pay (Saari, 2006: 3).

Table 2

Comparison of Basic Measure Types

TYPE OF MEASURE	VARIABLES TO BE MEASURED	VARIABLES EXCLUDED
Physical	Quantity	Quantity and distribution
Fixed price value	Quantity and quality	Distribution
Nominal price value	Quantity, quality and distribution	None

Source: Saari, S. (2006). Productivity. Theory and Measurement in Business. Espoo, Finland: European Productivity Conference.

Measurable categories in economics are referred to as economic quantities. Economic categories arise as a result of human understanding (as objective and possible) of the notions characterising reality and economic activity. They make it possible to generalise elements and relationships describing economic processes in a static and dynamic manner.

Structural Properties of the Hotel Service Quality in Quantitative and Qualitative Categories

Table 2 shows that it is impossible to transform all non-measurable indicators into measurable. It seems to be true, based on analyses performed below. However, does everyone indeed have such point of view? Though a great scholar Galileo Galilei once said, "Measure what is measurable, and make measurable what is not". An object that is measurable for one customer may not seem measurable for another. Every person has a different understanding of what is measurable.

In accordance with the dominant socio-economic development trends, the needs of travellers, quality in the hotel industry is greatly differentiated. The complex structure of the hotel service embraces three major groups of components – spatial, technical-technological (tangible) and process-organizational (intangible). The hotel service is a complex of tangible and intangible elements that are mutually connected (Table 2).

Table 2

Hotel Product in Quantitative and Qualitative Categories (Measurable and Non-measurable)

PROPERTIES	QUANTITATIVE CATEGORIES	QUALITATIVE CATEGORIES
Classification properties	Officially adopted on the level of the World Tourism Organization (UNWTO) – we can measure the quantity, the capacity of lodging facilities (amount of establishments and number of rooms)	People's own assessment of their degree of satisfaction is that it is partly determined by their level of aspiration, not only of number of stars
Functional properties	The amount of equipment, assortment, amount of different needs or different stay – reasons	Hospitality or non-hospitality
Spatial properties	Adequately equipped surrounding accrued in numbers Capacities of areas built for specific purposes (number of rooms, number of beds, number of tables or seats in the restaurant, width of the stairway)	People's own assessment of their degree of satisfaction is that it is partly determined by their level of aspiration – a great extend the needs of consumers
Construction properties	Building materials (the unit of wood, stone, bricks, etc.), using the building measurements	People's own assessment of their degree of satisfaction is that it is partly determined by their level of aspiration – subjective opinion about appearance of the building. architectural solution
Technological properties	L_{U-} total work of equipment, machinery	None

Security properties	The number of security standard systems	Own feelings in relation to the security level, immaterial safety aspects, according to personal personality features
Ecological properties	Energy economy Material recycling Air and surface water pollution control Waste disposal	None
Ergonomic properties	Length of bed , room Temperature of the air, water	None

Source: Prepared by the authors

In human history, people gave answers to things that couldn't be understood in the world and the matter of measuring and limiting an object to a measure made people think and look at the world rationally. Religious believers conflict with the concept of science and the advances through the innovation of human knowledge, and measurement is one of these innovations. This is why religious thinkers will not understand the concept of measurement to everything.

Conclusions

Math is very important in the process of measuring. The societies have developed an international system of how numbers work. Math is an international language that fosters understanding among the societies. It is a means of communication in business industries.

Fields of science with higher degrees of formalisation apply mainly interval and quotient scaling to measuring quantities. Measuring is applied in pedagogy, sociology, philosophy, ethics or history by three measuring methods – dichotomous division, nominal scaling, and arrangement. Physics, chemistry, astronomy, chemical engineering and electronic engineering represent highly exact sciences as they mainly apply such measuring methods as interval and quotient scaling.

What is very important – the language of economic categories is the starting point for the description of sociology phenomena, processes and laws. The gist of the problem is that the notions associated with it are of measurable and immeasurable nature.

The authors of this article prove that:

- It is impossible to transform all non-measurable indicators into measurable indicators.
- Economic categories perceived from the point of view of quantitative modelling represent qualitative and quantitative properties.

Finally, anything can be measured, and if not, the problem lies in the advancement of technology. Maybe in the next hundred years, mankind will be able to measure whole

galaxies. While something seems immeasurable for someone, it is perceived as measurable by another person. It is not likely that everything that is related with quality in this world is measurable.

However, there are no grounds to believe that subjective indicators are less valid and reliable than other survey data, which are always affected by measurement errors. Subjective indicators measure what they ought to measure and they are sensitive to societal developments.

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SOME SUSTAINABILITY INDICATORS OF BIOENERGY

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Abstract

Bioenergy as one of the renewable energy resources is currently at the global focal point due to both its effect on environment and the necessity to replace rapidly decreasing fossil energy sources with renewable, sustainable and more environment-friendly source. Effective indicators, which are subjected to increased attention, can help to identify and quantify the sustainability attributes of bioenergy development. Indicators are needed to assess environmental, social and economic sustainability of bioenergy systems. Along with the benefits of bioenergy generation, the negative influence caused by some types of bioenergy is also stressed, and evaluated as different risks. The majority of such objections are related to the biomass production from the agricultural lands and field crops, which are commonly used for food or feed.
Keywords: *sustainability indicators, bioenergy, environmental social, economic.*

Introduction

The central goals of energy policy are security of supply, competitiveness, and sustainability, which are laid down in the Lisbon Treaty (European Union, 2011). Adopted ambitious energy and climate change objectives for 2020 by European Union (EU) – to reduce greenhouse gas (GHG) emissions by 20%, rising to 30%, if the conditions are right, to increase the share of renewable energy to 20%, and to make a 20% improvement in energy efficiency (Ibid.). This not only means that biofuels must deliver GHG savings compared to fossil fuels, but also that the cultivation, processing and distribution of biofuels do not cause any adverse impacts on the environment or society (Ibid.). Driven by policies aimed at enhancing energy security through the diversification of energy sources, reducing GHG emissions and accelerating agricultural

development, the production and use of biofuels have increased rapidly in recent years (Mandil and Shihab-Eldin, 2010: 13). These developments have outpaced the understanding of the potential impact of biofuels on the environment, sustainable utilization of natural resources and food security (Ibid.). Many countries, after assessing the sustainability of current biofuel strategies and policies, have introduced significant changes, including lowering targets and/or slowing down the growth rates to reach targets (Mandil and Shihab-Eldin, 2010: 14). Bioenergy sustainability is a key aspect of the further energy development (Deng et al., 2011). The EU agreed on the Renewable Energy Directive (European Commission, 2009), which establishes an overall EU target of 20% renewable energy to be used in electricity generation, heating and cooling and a target for individual Member States to deliver 10% renewable energy in transport. As a result of the growing evidence on the potential impacts of large scale bioenergy development and the concern voiced by numerous stakeholders, the Directive establishes minimum sustainability criteria for bioenergy production and consumption and makes the 10% dependent on sustainably available supply.

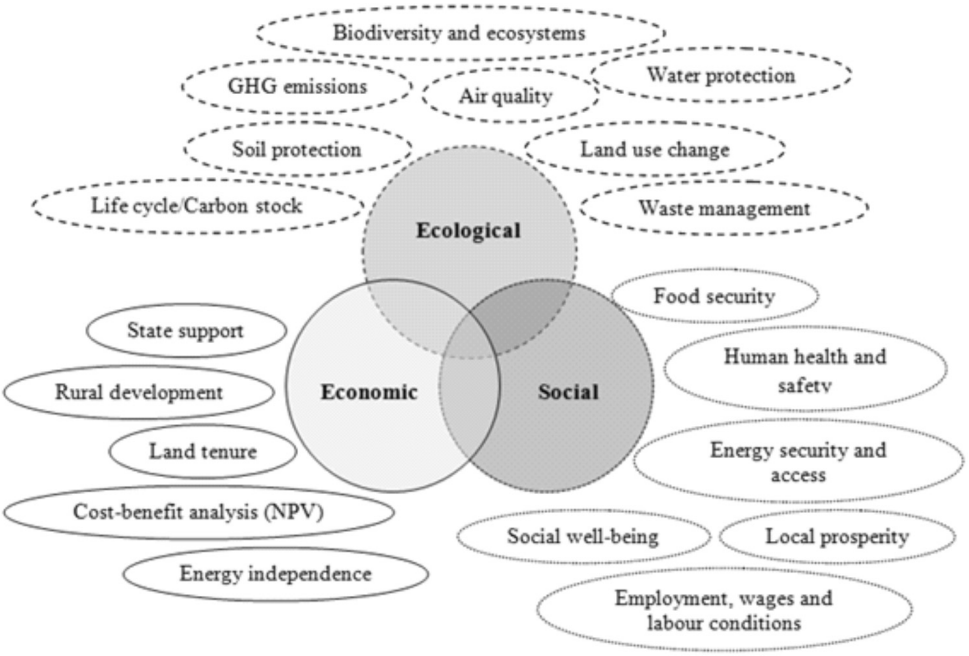
The aim of the study is to evaluate the sustainability aspects and indicators of bioenergy, particularly of biofuel, emphasizing the risks of sustainability. The following tasks are determined: to evaluate the most important aspects and indicators of sustainable development of bioenergy; to investigate several risks in connection with the main indicators of sustainability.

The principal materials used for the studies are as follows: different sources of scholar publications, research papers, norms, and the reports of international and EU institutions. The following research methods have been used in the process of study: systematic review, analysis and synthesis, comparative analysis, critical appraisal, logical induction and deduction and etc.

Sustainability Aspects and Indicators of Bioenergy

This chapter aims at providing an overview of the sustainability of the bioenergy, particularly biofuel production. Biofuels are considered sustainable when their entire production and supply chain is deemed to deliver positive environmental, social and economic impacts (Franke et al., 2013). The current supply of energy from, particularly fossil fuels, is unsustainable (Smeets, 2008; Arodudu et al., 2013). International Risk Governance Council (2008) considers that the challenge for bioenergy is to be a competitive substitute, in terms of availability, efficiency, sustainability and price, while being sustainable on the environmental, social, economic and climate dimensions. Energy security is a key dimension in bioenergy policies (Ibid.). Edwards et al. (2008) prescribes the need for the inclusion of environmental sustainability criteria for the use of biofuels and the need for close monitoring of sustainability performance.

For the purpose of the present study, we adopt the three dimensional view of sustainability, based on well-known definitions of sustainability as established by the Brundtland Commission: environment, society and economy. The sustainability aspects or groups (ecological, social and economic) of indicators, which have influenced, positively or negatively, the further development of bioenergy, particularly biofuels, have been summarized in Figure 1.



Source: Authors' construction based on Hamelinck et al., 2007; Sexton et al., 2009; BEFSCI, 2010; Van Dam et al., 2010; Bailey, 2013; Frank et al., 2013; Firrisa et al., 2014

Figure 1. Aspects/groups of indicators relevant for a sustainable production of bioenergy

Ecological aspect

The scholars (Haines-Young and Potschin, 2010; Bateman et al., 2013) accept world-wide the concept that the term 'sustainable development' must include the maintenance of ecosystem services and the elements of human well-being. Moreover, the human well-being depends on ecosystems' integrity (Haines-Young and Potschin, 2010) and management (IRGC, 2008). Haines-Young and Potschin (2010) recognizes the relationships between biodiversity and ecosystem functioning with insights into wider social and economic structures and processes. There is a common agreement that

bioenergy policies should not harm the sustainable development crops, because constraining factors such as water, productivity, social aspects and nature conservation are not taken into account (Beringer et al., 2011; Dauber et al., 2012). Moreover, Beringer et al. (2011: 229) argue that the full exploitation of energy crops' potentials will further increase the pressure on natural ecosystems. Despite the consideration of sustainability constraints on future agricultural expansion, the large-scale cultivation of energy crops is a threat to many areas that have already been fragmented and degraded, are rich in biodiversity and provide habitat for many endangered and endemic species (Ibid.).

Social aspect

Local production and use of bioenergy reduce the level of dependence on conventional energy imports and thereby increase the diversity and security of energy supply (IRGC, 2008).

Even though the job creation and rural development are mentioned as additional reasons for promoting biofuels, some studies show adverse results, for example, results of studies of U.S. biofuel mandates impact on shifts in agricultural production among regions show that production of cellulosic ethanol would not provide any additional economic activity, because the increase in ethanol output causes a reduction in livestock production (Jaeger and Egelkraut, 2011).

Renewable energy sources and the biofuels are subsidized at a much higher rate than fossil fuels (Laan et al., 2009). The subsidies should be a permanent part of the funding structure for the long-term health and growth of the bioenergy industry (Hoagland, 2013).

The Royal Society (2008) has, however, concluded that biofuels have a potentially useful role in tackling the issues of climate change and energy supply, important opportunities to reduce GHG emissions from biofuels, and to ensure wider environmental and social benefits, may be missed with existing policy frameworks and targets. At present, the biofuel development is supported by several policies and economic instruments. There is nevertheless a risk that the state and society may become locked into inefficient biofuel supply chains that potentially create harmful environmental and social impacts (Ibid.). One of the solutions for these issues is to develop more sustainable types of bioenergy (the so-called second generation biofuel) faster; and more active and effective use of different origin waste as feedstocks.

Development of sustainable biofuels

Biofuels produced from organic waste materials are generally considered to be sustainable, even if they use first-generation conversion technologies, as they do not impact significantly on land-use, indirect effects, food prices, etc. (European Biofuels

Technological Platform, 2009). Biofuels produced from wastes and residues offer a number of advantages (RSB, 2011). Waste origin biofuels could be produced using different feedstocks and technologies, for example: fuels from gasification, using a variety of feedstocks such as paper, plastics, tyres, chips and forestry residues, fuels from biomethane produced from the anaerobic digestion of sewage or domestic and industrial wastes; fuel from ethanol and higher alcohols, converting a range of cellulosic feedstocks to ethanol; hydrocarbons from sugars, converting plant sugars directly to biogasoline; bioenergy carriers or biofuels from algae, utilising waste water such as landfill leachate (Brinker & Coombs, 2013).

Some Sustainability Risks of Bio-energy

Many scholars (e.g. German and Schoneveld, 2012) believe that bioenergy production and consumption can provide multiple environmental and socio-economic benefits (e.g. GHG emission savings, improvements in energy security and trade balances, opportunities for economic and social development, mitigation of waste disposal problems and better use of resources). Nevertheless, the further sustainable development of bioenergy (including biofuels), particularly first-generation biofuels, have some more or less important sustainability risks. For the evaluation of several indicators that comprise the sustainability risks, they were divided into three groups: 1) environmental indicators or risks; 2) social indicators or risks; and 3) economic indicators or risks.

Environmental risks

Biodiversity and ecosystem services – The risks for biodiversity and ecosystem, *inter alia*, landscapes are the following: the feedstocks, which are cultivated as intensive monocultures (as is the case for many important food crops), where the conversion of extensive agricultural systems and natural habitats such as grasslands into intensive monocultures is one of the major threats to biodiversity; non-native feedstocks are also potentially invasive and may have negative impacts on ecosystems; ecosystem services such as soil regeneration, carbon sequestration, natural chemical cycles, pollination and protection against flood may be affected (JRGC, 2008; Haines-Young and Potschin, 2010; German et al., 2011; Pedroli et al., 2013). Moreover, the protection of biodiversity should be considered a core global benefit concern (Franke et al., 2013).

Water quantity and quality – Many crops require significant levels of agrochemicals, which can pollute water resources. Pollution from agricultural chemicals damages areas far beyond the zone of cultivation (de Gorter and Just, 2010). Large amounts of water are also required in processing bioethanol and biodiesel (IRGC, 2008).

Soil erosion and degradation – Monocultures, especially of arable crops requiring annual tillage, are typically associated with high rates of soil erosion, and some crops

also deplete soil nutrients more rapidly than others and require energy-intensive fertilisers to maintain year-on-year yields (de Gorter and Just, 2010).

Direct and indirect impacts of land-use change: "displacement effects" – Changes in the land-use can result in significant GHG emissions that are not being included in conventional LCAs, and render uncertain the net carbon benefit of bioenergy use (IRGC, 2008). The most significant GHG emissions from farming are from making nitrogen fertilizer (which are relatively well-known) and from nitrous oxide release from farmed soils. These are important because N_2O has nearly 300 times the global warming potential of the same mass of CO2 (Edwards et al., 2008). The results show that N2O contributes 15–60% of the GHG emissions from making biofuels on set-aside land in the EU (Ibid.).

Greenhouse gas emissions – The Royal Society (2008) has reported that biofuels risk failing to deliver significant reductions in GHG emissions from transport and could even be environmentally damaging. The assurance of 5 per cent of sold biofuels does not guarantee a target to reduce GHG emissions (Ibid). Moreover, Pehnelt and Vietze (2012) stress that the saving values of rapeseed biodiesel of GHG emissions, stated previously by the EU, are more than questionable. Conversely, Finco et al. (2012) argue that the use of rapeseed biodiesel represents a good opportunity to achieve the European goals in terms of reducing GHG emissions, considering a saving of emissions, measured in CO2 equivalents, of 56% respect to conventional diesel.

Air pollution – Criteria pollutants are reduced with biodiesel use, and scholars (e.g. Giakoumis et al., 2012; Shirneshan, 2013) conclude that the use of biodiesel in diesel engines results in substantial reductions of unburned hydrocarbons, carbon monoxide, and particulate matter (Biodiesel Emissions...). However, biodiesel tends to increase the nitrogen oxides emission, at least for older production engines (Chapman et al., 2003; Giakoumis et al., 2012). The increasing of NOx emissions with biodiesel blends is expected, potentiating the tropospheric ozone formation (Ribeiro et al., 2011). However, biodiesel's lack of sulfur allows for the use of NOx control technologies that cannot be used with conventional diesel (Biodiesel Emissions...).

Social risks

Food security – A key element of social sustainability is food security (Franke et al., 2013). The diversion of edible crops from food markets to bioenergy production has resulted in increased competition for agricultural land and led to impacts on food prices (e.g. Smeets, 2008; Sexton et al., 2009; German et al., 2011). Additional expansion of the use of agricultural crops for bioenergy could further worsen global food security, which is already at risk due to population and consumption growth requiring more food and more energy (Baily, 2013).

Land rights and displacement – Poorly-managed expansion of bioenergy production may undermine traditional sustainable agricultural and land-use practices, and can lead to adverse societal impacts. If bioenergy crops become more valuable, industrialisation of production and land consolidation may favour large landowners and displace small farmers.

Employment – Bioenergy may not provide an adequate diversity and quality of employment opportunities in the long term; and initial employment opportunities may be short-term and superseded by mechanised production and processing (IRGC, 2008). Moreover, it is concluded that the net EU employment effects, under the biofuel technology and market assumptions specified in the scenarios, are neutral or close to neutral (Edwards et al., 2008).

Energy security – To meet the consumption target of 10 per cent renewable fuels in the transport sector by 2020 in EU, the planned expansion of domestic production of first – generation biofuels is not sufficient to meet the consumption target. In this context, the import is planned to increase significantly as well to account for 25.4 per cent of the biofuel consumption in energy terms (Jansson & Wilhelmsson, 2013). It means that one target of bioenergy development – energy security – will not be achieved.

Public perception – The increasing public concern regarding the sustainability and environmental impact of current biofuel production and use may lead to an adverse perception of bioenergy in general. Currently, the public opinion of bioenergy and biofuels in particular is polarised (IRGC, 2018).

Economic risks

Rising prices – Biofuels are already contributing to increased food prices, though this relationship remains controversial and, no doubt, varies with the feedstock involved (De Gorter and Just, 2010). Competition between different land-uses, bioenergy feedstocks and food products, agricultural wastes, wood fibre and other products in the forestry sector is driving many other prices upwards (IRGC, 2008). With feedstock cost representing a significant proportion of the overall cost of first-generation biofuel production, it is even arguable that further large increases in feedstock costs could undermine the market attractiveness of biofuels. The rising prices of crops such as wheat, maize and oilseeds have led to knock-on increases in the prices of staple foods and consumer products (Steenblik, 2007). The EU biofuel mandates alone could push up the price of some foods by as much as 36 per cent, assuming that the 10 per cent mandate remains unchanged (Fenwick, 2013).

Cost-effectiveness – Subsidising biofuels and bioenergy with the aim of reducing GHG emissions is a less effective and costlier way of achieving this goal than many other solutions, such as improving energy efficiency and conservation or encouraging more effective renewable energy options where feasible. The structure of existing support

(sum of biofuel subsidies and farm payments) will not only continue to be significant, but is likely to rise over time (Steenblik, 2007). Moreover, taxpayer costs of biofuel and renewable energy policies in general are very high, especially relative to their benefit, which can easily be negative (de Gorter and Just, 2010). For example, biofuel mandates are likely to cost UK consumers between £ 1–2 billion a year by 2020 (Fenwick, 2013). Regarding cost-effectiveness, Franke et al. (2013) suppose that the calculation of Net Present Value (NPV) can be used as a tool to assess the financial impact of a bioenergy project.

Market distortions – Subsidies have been instrumental in driving the development and growth of the bioenergy, particularly in industrialised countries. These subsidies have been allocated at almost all parts of the value chain (de Gorter and Just, 2010); and often had adverse effects, creating distortions in the market for grains and oilseeds. Subsidies and mandates by themselves do not discriminate against international trade, however, production subsidies, import tariffs and sustainability standards do. These trade distorting policies can create huge inefficiencies (de Gorter and Just, 2010).

Trade distortions – International trade is being distorted through country-specific subsidies, as in the US or the EU (IRGC, 2008). Trade barriers both protect inefficient biofuel industries and prevent developing countries from exploiting their comparative advantage in producing biomass (Steenblik, 2007).

Risks related to policy and regulatory frameworks – In the context of changing or unclear policy development and related regulation, investors face an economic risk. Currently, there is no clear ex-ante plan to guide upstream or downstream public support of renewable energy technologies (IRGC, 2008). Therefore, the public sector has risks of clean energy investments (Rausser et al., 2010).

Conclusions

Many scholars believe that bioenergy production and consumption can provide multiple environmental and socio-economic benefits (e.g. GHG emission savings, improvements in energy security and trade balances, opportunities for economic and social development, mitigation of waste disposal problems and better use of resources). Nevertheless, the further sustainable development of bioenergy (including biofuels), particularly the first generation biofuels, poses some more or less important sustainability risks. For the evaluation of several indicators that comprise the sustainability risks, they were divided into three groups: 1) environmental indicators or risks; 2) social indicators or risks; and 3) economic indicators or risks show that majority of risks are related to the biomass production from the agricultural lands and field crops, commonly used for food or feed. These are, for example, the risks for biodiversity and ecosystem; changes in the land-use, which can result in significant GHG emissions; air pollution; the food security; increased food prices; market and trade distortions; and rising support, which could be

paid by general society. The solution is to develop more sustainable types of bioenergy (the so-called second generation of biofuel) faster; and more active and effective use of different origin waste as feedstocks.

At present, the biofuel development is supported by several policies and economic instruments. There is, nevertheless, a risk that state and society may become locked into inefficient biofuel supply chains that could potentially create harmful environmental and social impacts. Moreover, taxpayer costs of biofuel and renewable energy policies in general are very high, especially relative to their benefit, which can easily be negative in some cases.

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CULTURE AND TECHNOLOGICAL PROGRESS IN THE CONTEXT OF EUROPEAN INTEGRATION: NEW CHALLENGES

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Abstract

The present paper deals with new challenges for changes in the European cultural, technological and economic space in the context of globalization, European integration and the creation of knowledge-based society and knowledge economy. The main attention is paid to the development of the high technology sector in the European Union, as well as to the impact of technological advances on the changes in the European cultural space. The author of the present article characterizes the main trends in the creation and development of the high technology sector, especially – under conditions of European integration and the creation of knowledge-based society.

The author describes the original theoretical concept of the creation, development and further modernization of the high technology sector, based on the priority to initiate synergy effects. The essence of this theoretical concept – orientation to the multifaceted interaction between different cultures, different organizational systems, institutions and societal groups representing different activities, functions, interests, as well as different sectors of economy and societal life, different industries and spheres of production, manufacturing and services. The ideas of networking and rationalization of various regional cultural and economic systems, as well as the ideas of the development of regional and interregional high technology oriented clusters are discussed. These ideas are presented in the context of technological progress related problems and the creation of knowledge-based society and knowledge economy. It is suggested that the development of high technology sectors and the increase in efficiency of various national and regional economic systems could be defined as a critical preconditions for successful cultural development and creation of modern knowledge-based economy both in the whole European Union and in individual countries.

JEL Classification: *A10, F01, F39, O39, Q59*

Keywords: *high technologies, knowledge society, knowledge economy, culture, European integration, European Union, networking, clusters.*

Introduction

Cultural changes and technological progress could be defined as a system of very complicated and multifaceted processes covering all spheres of societal life and all possible directions of social, economic and technological development in the contemporary society in general, as well as in the society of European Union countries. In turn, the creation, development and modernization of the high technology sector could be characterized as an especially important part of the processes belonging to this system. It can be noted that the creation, development and modernization of the high technology sector should be defined as the key priority of social, economic and technological development in the European Union. It is obvious that the future of the European Union lies in the creation of the knowledge-based society and knowledge economy, and the high technology sector is the key component of the knowledge-based society and knowledge economy, while the high technology sector's development covers all spheres of the social and economic life of the contemporary society in the European Union. This means that intensive development and further modernization of the high technology sector should be defined as the most important precondition for successful social, cultural, economic and technological changes and for the creation and development of the knowledge-based society and knowledge economy in the European Union, as well as especially important priority of the scientific research of the processes of European integration, sustainability and social and economic development in the European Union under conditions of globalization.

The key issues that require strategic decisions on the future of the European Union are to be considered as issues of creation, development and further modernization of effective high technology sector. The essence of these issues could be revealed in the following questions:

- What should the high technology sector be like in the future in the European Union?
- How should the high technology sector be created, developed and modernized in the European Union?

The need to find answers to these questions determines the necessity to elaborate and implement appropriate strategies for the creation, development and modernization of the high technology sector.

This theoretical article analyzes a new approach towards generating new long-term strategies for the creation, development and modernization of the high technology sector in the European Union. This approach is a result of scientific research. The object of the research – the development and modernization of the high technology sector, as well as the creation of the knowledge-based society and knowledge economy under conditions of enlargement of the European Union.

The objective of the completed research is to prove the fact that key priorities of development and modernization of high technology sector as well as of the creation of the knowledge-based society and knowledge economy are the urge of technological advancement and enhancement of compatibility and productivity, using such opportunities as specialization of national and regional economies, creation of clusters and their networks, as well as the development of the so-called hyper-clusters in the entire cultural and economic space of the European Union.

The methodology of the research was based on the ideas and principles of complex analysis of the development and modernization of high technology sector in the context of general processes of the European integration and the creation of knowledge-based society and knowledge economy.

The main result of the research is the concept of strategic decisions oriented towards the development and modernization of the high technology sector through the creation of new technological quality, as well as the implementation of these strategic decisions into practice to encourage cultural changes and create the knowledge-based society and knowledge economy in the European Union.

The key tasks of the research are to:

- demonstrate the fact that the high technology sector in the European Union should be created, developed and modernized according to the universal principle of new technological quality creation;
- reveal the essence of rational specialization of national and regional high technology sectors;
- prove the need to create and apply the strategies oriented towards the development and modernization of the high technology sector.

These tasks have been a priority in the context of the processes of active cultural changes and the creation, development and modernization of the high technology sector, as well as of the creation of modern knowledge-based society and knowledge economy in the European Union in general.

High Technology Sector in the Context of Contemporary Societal Life and Cultural, Social and Economic Development: Main definitions and specific features

The high technology sector in the European Union could be defined as a very important, complicated and multifaceted part of contemporary economy and the system of the social and economic life, especially – in the European space. At the same time it is possible to say that the high technology sector in the European Union could be defined

as a very important, complicated and multifaceted object of scientific cognition, research and studies.

There are many quite different approaches to the definitions, as well as to the composition and structure of the high technology sector (Melnikas, 2011).

However, it is possible to distinguish several essential features of the high technology sector:

- the creation, development and further modernization of the high technology sector should be defined as the main precondition for the qualitative changes and qualitatively new outbursts in all fields and sectors of contemporary societal life, including all sectors of contemporary economy, all countries and regions, the life and priorities of all groups of society, all areas and directions of the political, social, economic, technological development and of the changes in culture, lifestyle and value structure;
- the industrial products and various high technology services have absolutely new quality, the essence of which – innovations, new knowledge and new results of intellectual activities, as well as new development or usage potential accumulated in these products or services;
- the intellectual and innovative activities, including the creation, multiplication and practical usage of the new knowledge, should be defined as the main activities in the high technology sector;
- intellectual resources and human resources, which are oriented towards the intellectual activities, creativity and innovations, should be defined as the main resources in the high technology sector;
- new features, characterizing the new knowledge and innovations, the novelty and new quality of products and methods, technologies and organizational forms of activities are the dominant characteristics of the high technology sector;
- the high technology sector is complex and integrated in nature; it covers and involves many units and parts of different profile with different functions and with a focus on different and complementary results;
- the development processes and activities in the high technology sector are based on the interaction between various units and parts of this sector, different structures and systems of contemporary society and economy in the world, in different countries or regions; in general, the development processes and activities in the high technology sector are based on the creativity, innovations and various synergy effects, representing the new quality and qualitatively new results;
- intensive internationalization should be defined as especially important precondition for the creation, development and further modernization of the high technology sector in various countries, regions and in the global space.

In general, these essential features could be defined as the prevailing characteristics of the high technology sector. Of course, these characteristics could involve a number of additional features.

The high technology sector involves many different units, parts, industries, as well as different types and forms of production, manufacturing and services.

It is important to note that the main preconditions and assumptions to the high technology sector development and its modernization in the future are closely related to the creativity and intellectual activities, the innovation processes and innovative activities, internationalization and international cooperation in all spheres of social, economic, technological development. Another important precondition is the synergy oriented towards the interaction between different units, parts, structures and systems, especially between those, which are responsible for different functions and activities in various areas of fundamental and applied scientific research, university studies and professional education, consulting and other academic and intellectual activities, various areas of practical business and industrial activities, in public and governance institutions.

The high technology sector is characterized by the variety of technologies, products and legal status, as well as organizational forms of enterprises, institutions and organizations operating in this sector.

There are many spheres and specific sectors of contemporary economy, which could be defined as particularly important and typical parts of the high technology sector:

- information and telecommunication technology sector, as well as modern communication, including the electronics based communication, media and other services, which are characterized by the use of modern information and telecommunication technologies;
- industries, which are characterized by the use of the mechatronics and modern electronics based technologies, especially – appliances, instruments and machinery manufacturing industries;
- industries, which are characterized by the use of the modern bio- and chemical technologies, as well as pharmaceutical industries;
- industries and services with a focus on modern transportation technologies and logistics;
- industries and services, which are oriented towards production of the aircrafts and modernization of aviation, as well as to the aeronautical development and activities in the aerospace;
- industries and services, which are oriented towards the creation, production and use of new materials;
- industries and services, which are oriented towards the maritime transport development modern fishery and manufacturing of ships;
- industries and services with a focus on the creation and development of alternative and more effective energetic;

- industries and services with a focus on the creation and development of more effective agricultural sectors;
- services in all sectors of health care, as well as medical services in general;
- military industries and security services;
- other parts of the high technology sector.

All these parts of the high technology sector could be defined as particularly important under contemporary conditions of European integration and in the context of development and enlargement of the European Union. In addition, the processes of the creation, development, multiplication and use of the high technologies affect all areas of social, economic and technological life. These processes could be defined as absolutely universal processes typical for contemporary society.

Main Challenges, Needs and Priorities of the High Technology Sector's Development in the European Union

The priorities, processes and problems associated with the development and modernization of the high technology sector in the European Union should be analyzed in the context of globalization, European integration and enlargement of the European Union, as well as in the context of the creation of knowledge-based society and knowledge economy.

The aforementioned processes should be defined as the environment for the high technology sector's development and modernization in the European Union (Ambros, B., Schlegelmilch, B. B., 2009; Brakman, S., Garretsen, H., Marrewijk, C. van, Witteloostuijn, A., 2006; Calori, R., Atamer, T., Nunes, P., 1999; Castells, M., 2005–2007; Chobanova, Y., 2009; Dodgson, M., 2010; Epping, R. Ch., 2009; Gillespie, A., 2010; Gros, D., Steinherr, A., 2004; Hayes, J., 2010; Johnson, D., Turner, C., 2006; Harrison, A., 2010; Hunt, S. D., 2000; Parker, B., 2005; Stiglitz, J., 2009).

The need to develop and modernize the high technology sector in the European Union is determined by a number of problems, which are analyzed and described in various scientific publications (Melnikas, B., 2002, 2011; Melnikas, B., Reichelt, B., 2004; Wiener, A., Diez, Th., 2009).

There are the following problems typical for the current situation in the European Union, which require essential and radical decisions in the area of high technology sector's development and modernization:

1) There are very limited sources of energy and raw-materials in the territory of the European Union. The need for these resources has been steadily growing, which means that the European Union becomes more and more dependent on increasing needs, consumption and usage of these resources: perspectives of

economic development of the European Union, along with economic and energetic security of the European Union have been influenced by various economic and political factors characterizing export of these resources to the European Union.

2) There are many employment problems in the European Union, especially for well-educated young people. However, there are also many cases where the lack of simple labour force and certain specialists imposes limits on the economic growth, business activities and technological progress.
3) Within the countries of the European Union very high standards of living are being implemented, incl. the spheres of social security and social warranties, as well as environmental protection. As a consequence, all economic endeavours within the territory of the European Union require substantial expenditure, which subsequently means that the cost price of the products manufactured in the European Union is very high. The increase in the cost price, which is disproportionate to the quality of products, determines the fact that products manufactured in the European Union become increasingly incompatible.
4) The key indicator of well-being in the European Union is the ability to manufacture products to the increasing extent and more massively for both local and global markets, and sell high quality products for high price. This means that the European Union needs more markets (moreover, adequately high purchasing power is of crucial importance). Inadequacy of such markets threatens the development of economies of the European Union.

These problems are indicative of strong need for both quantitative and qualitative transformations in the European Union (Fligstein, N., 2010; Lane, J.E., Ersson, S.O., 1996; Hix, S., 2006; O'Mahoney, J., 2010; Sabathil, G., Joos, K., Kessler, B., 2008). It could be noted that these transformations include the creation, development and modernization of the high technology sector. The necessity to respond to these problems determines the main challenges to the European Union and its development. It is worth mentioning that over the last decade, greater possibilities to ensure quantitative increase could be observed in the European Union, whereas numerous difficulties and unpredicted obstacles could be observed in the sphere of qualitative development (Melnikas, B., Reichelt, B., 2004, Melnikas, B., 2011, 2013). For this reason, qualitative development of the European Union should receive priority consideration: prospects of the European Union are basically influenced by the creation of the knowledge-based society and knowledge-based economy, and especially – by the creation, development and further modernization of the high technology sector.

Synergy Effects and the Idea of "Creation of a New Quality": Theoretical approaches to the creation, development and modernization of high technologies sector in the European Union

The creation, development and modernization of the high technology sector in the European Union are inseparable from the creation of knowledge-based society and knowledge economy. This means that the scientific research on the processes of the creation, development and further modernization of the high technology sector could be based on the same theoretical grounds and approaches as the scientific research on the processes of the creation of knowledge-based society and knowledge economy in general. It can be assumed that the general theoretical background for solving the problems of the creation of knowledge-based society and knowledge economy could also be applied to many specific cases of the creation, development and further modernization of the high technology sector.

The numerous theoretical approaches applied to the creation of knowledge-based society and knowledge economy could be perceived and defined as a theoretical basis for the scientific cognition and research on the processes of the creation, development and further modernization of the high technology sector in the European Union. It is obvious that the main theoretical approaches to the creation of knowledge-based society and knowledge economy could be defined as quite universal and suitable for the creation, development and further modernization of the high technology sector (Melnikas, B., 2002, 2011). Of course, these universal theoretical approaches should be analyzed and described in more detail.

Some prospective theoretical approaches to the creation of knowledge-based society and knowledge economy, incl. the creation of knowledge-based society and knowledge economy in the European Union, are described in many scientific publications (Melnikas, B., 2002, 2011, 2013). It is noted, that the creation of the knowledge-based society and knowledge economy as a key priority of further development, modernization and enlargement of the European Union, could be defined as especially complex process oriented towards the formation of a brand new society and qualitatively new life style. Moreover, this process can be described as of "double" complexity as it reflects the striving for the new quality in the following two aspects:

- the knowledge-based society and knowledge economy are being formed, which, if compared to the "traditional" society and economy, are considered as qualitatively new;
- the development of the knowledge-based society and knowledge economy is completed under conditions of enlargement of the European Union, which means that qualitative changes have been taking place in the entire European Union.

Examining the possibilities and prospects for the creation of knowledge-based society and knowledge economy in the European Union, it is recommended to apply the universal principle of new quality creation. This principle could be applied in various situations; it is suitable when examining both the development of the knowledge-based society and knowledge economy, and common processes typical of the European Union, its political, social and economic development and enlargement.

The universal principle of the creation of a new quality could be defined as follows: new quality always develops through amalgamation, when elements of different origin, which have never belonged to the same system, collide. This principle implies the idea of developing and using the synergy effect, and demonstrates that qualitative transformations always require actions and means necessary to join elements of different origin to the common system.

Applying the universal principle of the creation of new quality, it is important to consider the fact that new quality is always created as a result of amalgamation. At the same time, it is worth mentioning that the processes of amalgamation can be very different, and in the most common case can represent two types: processes of integration and processes of synthesis.

The processes of integration usually prove that the colliding elements never lose their major primordial features in the course of amalgamation: this means that the result of the integration marking the new quality can be disintegrated according to previous features of the amalgamated elements.

The processes of synthesis demonstrate that colliding elements miss their major primordial features in the course of amalgamation; this means that the result of the synthesis possessing new quality cannot be disintegrated according to the previous features of the collided elements. We may state that qualitative changes within the synthesis are never recurrent, whereas qualitative changes within the integration may recur in some cases.

Understanding the meaning of the processes of integration and synthesis as processes of creation of a new quality allows for applying the universal principle of the creation of new quality, examining very complex manifestations of the development, modernization and enlargement of the European Union, incl. the creation of knowledge-based society and knowledge economy. When analyzing these manifestations, it is critical to assess to what extent the development, modernization and enlargement of the European Union is based on the processes of integration, and to what extent the processes of synthesis determine the development, modernization and enlargement of the European Union.

Elaborating and implementing the strategies of the creation of the knowledge-based society and knowledge economy, it is necessary to logically forecast various vehicles designed to expand and develop the integral economic, social and cultural space of the European Union. These vehicles should inevitably be focused on both processes – the integration and synthesis.

Rational complementation of the vehicles designed for integration and synthesis can be a basis of the implementation of very effective strategies for the creation of knowledge-based society and knowledge economy in the European Union. Subsequently, the application of the universal principle of "new quality creation" should be considered as a priority when elaborating and implementing the strategies designed for the development, modernization and enlargement of the European Union (Melnikas, B., 2011).

At the same time, there are some specific circumstances typical for the creation, development and further modernization of the high technology sector in the European Union. They could be defined as very important and having significant impact on the situation in social, economic and technological space of the European Union. Of course, these specific circumstances could be characterized more in detail.

The main specific characteristics of the processes of the creation, development and further modernization of the high technology sector in the European Union are:

- the focus on scientific progress and technological development, especially on the creation, multiplication and use of the innovative and effective new technologies, as well as on new technology oriented lifestyle models and stereotypes;
- the priority to use new technologies for solving actual social, economic, ecological, technical, as well as military and other problems in all areas of life of contemporary society;
- particularly important role of the creativeness and orientation towards innovation activities, especially, in various fields and areas of the scientific and technological progress, as well as the significance of various legal and ethical factors and aspects of the intellectual property development;
- specific aspects of internationalization processes typical for the creation, development and further modernization of the high technology sector, incl. specific aspects of governance and management in the high technologies sector in the context of globalization, European integration and enlargement of the European Union;
- multifaceted international, intercultural, interregional interaction.

It can be noted that multifaceted international, intercultural, interregional interaction, as well as interaction of other types, should be defined as a particularly important factor and type of specific circumstances typical for the creation, development and further modernization of the high technology sector in the European Union. These interaction processes are very different, and the most important among them could be considered as follows:

- Interaction between different processes that should be very intensive, goal-oriented and generating the synergy effects. It should be defined as characterizing the interaction between the mutually complementary processes of different nature, types and orientations. A particularly important precondition for the

creation, development and further modernization of the high technology sector in general, and especially in the European Union, is the interaction between various mutually complementary processes of the scientific research, academic studies, applied research, professional education, consulting, political development, business and public activities, incl. goal-oriented business initiatives and goal-oriented initiatives to change the lifestyle and consumption in various fields and areas of societal life and of different business and public sectors.

- Interaction between different sectors, that should be very intensive, goal-oriented and generating the synergy effects. It should be defined as characterizing the interaction between different sectors of the societal life, of the economy and the different groups of the society. A particularly important precondition for the creation, development and further modernization of the high technology sector in general, and especially in the European Union is the interaction between various sectors of the societal life and economy, especially between different industries and service sectors, different manufacturing, private and public service sectors.
- International, interregional and intercultural interaction that should be increasingly intensive in the future in the context of globalization and multifaceted internationalization processes is a very important factor of generating the synergy effects. It should be defined as characterizing the interaction between various and quite different national cultures and various organizational systems, which belong to different countries, regions and groups of countries and nations. This kind of interaction could be defined as an especially important cultural, political and environmental precondition for goal-oriented development of the high technology sector.

In addition, it may be noted that there is specific characteristics related to the use and adaptation of the universal principle of new quality creation under conditions of solving the problems of the creation, development and further modernization of the high technology sector in the European Union. This universal principle of the scientific research and practical activities related to the processes of the creation of knowledge-based society and knowledge economy, could be interpreted as a specific principle of the creation of new technological quality under conditions of solving the problems of the creation, development and further modernization of the high technology sector in the European Union. The main reason for changing the interpretation of this principle is that specific features of the high technology sector represent many orientations and priorities of the creation, use, development, multiplication and modernization of high technology and technology oriented products.

In general, it is possible to conclude that the specific principle of the creation of new technological quality could be interpreted as a very important component of theoretical

basis to solve the problems of the creation, development and modernization of the high technology sector in the European Union.

Strategic Decisions Oriented Towards Innovative Development of National and Regional Economies: Hyper-clusters and networking in the high technologies sector

The strategies oriented towards the development, modernization and further enlargement of the European Union, as well as towards intensive creation, development and modernization of the high technology sector in the European Union, could include a wide range of solutions and strategic decisions covering different spheres of social and economic life.

There are several types of strategic decisions and solutions that could be defined as particularly significant and perspective in the context of contemporary challenges of globalization, European integration and of the creation of the knowledge-based society and knowledge economy in the European Union. Among such strategic decisions and solutions, it is possible to highlight some priority decisions oriented towards innovativeness and rationalizing of national and regional economic systems, especially – the strategic decisions, which are based on the ideas of "oases", hyper-clusters and networking in the high technology sector. All these ideas and types of strategic decisions and solutions are related to the need to solve the problems of the creation, development and modernization of the high technology sector in the European Union.

Of course, the strategies oriented towards the development, modernization and further enlargement of the European Union, and towards the intensive creation, development and modernization of the high technology sector in the European Union, can be designed for the entire European Union and for particular spheres of social and economic life in the European Union. One of such spheres is the development of national and regional economic systems and the creation of cluster based economy of a new type.

The strategic decisions, which are oriented towards innovativeness and rationalizing of national and regional economic systems and the ideas of "oases", hyper-clusters and networking in the high technology sector, are based on the intention to rationalize the structures of national and regional economic systems and create favourable conditions for innovative and intensive development of every national or regional economy.

The essence of rationalization of national and regional economic systems' structures, as well as the ideas of "oases", hyper-clusters and networking in the high technology sector lies in the priority to create and develop the economy that could be characterized as very efficient, sustainable, continuously growing, as well as by growth of the high technology sector.

The essence of the idea of "oases" lies in the creation of particularly favourable conditions for development, modernization and certain activities in various areas and spheres of the societal life. The creation of regional (territorial) or sectoral "oases" could be defined as especially perspective way of effective, innovative and intensive social and economic development in the European Union, including – active development of the high technology sector.

In general, "oasis" is an economic system, possessing extremely advantageous political, legal, economic and other conditions for activities and development. These conditions are exclusive, and in their presence the "oasis" receives various privileges or an extremely beneficial environment. "Oases" can be established on behalf of political will of a state or even a group of states. The idea of regional "oases" is very viable in the improvement and implementation of regional policy of the European Union. There are intentions to create "oases" not only in particular countries, but also in regions.

Regional "oasis" is the one where exceptionally advantageous conditions for economic development are created in a territorially outlined area (region). This area may or may not coincide with systems of administrative territorial division of particular countries. Sectoral "oasis" is the one where exceptionally advantageous conditions are created for particular branch of economy, and particular segments of business or public sector.

In the process of creating and developing "oases", it is very important to consider the demographic situation, possibilities to attract, concentrate and efficiently use human and financial and other resources, as well as possibilities of rapidly expanding various innovations. The idea of "oases" can be used as a basis for solving many problems of the so-called rational specialization of the national and regional economic systems (Melnikas, B., 2011, 2013).

By proper specialization, we can understand the situation where the range of products produced within the economic system guarantees magnification of the surplus value within this system. The economic system should be exceptionally oriented towards a series of products, services and activities, whose structure allows for achieving potentially greater surplus value or higher velocity of the increase in this value.

For the sake of rationalization of the national or regional economic system, various means may be implemented. These means should create a solid complex. They have to be long-term and consecutive. The idea of the means should ensure that the entire economic system of a particular region or country is developed as a large macro-cluster or hyper-cluster. These large macro-or-hyper-clusters may be multi-profiled and oriented towards the creation of different and diverse final products. It is very important to create final products that are compatible in global markets.

It is obvious that large macro – or – hyper-clusters in particular countries or regions should meet the following requirements:

- large clusters of this kind function as open systems, maintaining both internal and external economic and technological relations in international and global markets;
- various specialized clusters can be created within large clusters of this kind, incorporating diverse scientific, research and educational institutions, producing enterprises and services providers, business incubators, parks of science and technology, centres for innovation, as well as industrial, trade, transportation and communication companies.

Development of large economic systems through networking of clusters may be of great variety. A very prospective method is the creation of regional (territorial) or sectoral "oases" (Melnikas, B., 2011, 2013).

The implementation of the aforementioned strategies is a very important factor to ensure that the creation and development of high technologies sector, as well as creation of knowledge-based society and knowledge economy in the European Union in general, become a reality.

Conclusions

The creation, development and modernization of the high technology sector in the European Union, general intellectualization of cultural, social and economic life and the creation of the knowledge-based society and knowledge economy in the European Union are very complex, long-term and multifaceted processes.

The key challenges and priorities that require the main attention in the context of the creation, development and modernization of the high technology sector in the European Union, as well as the creation of the knowledge-based society and knowledge economy in general, are the following:

1. The creation, development and modernization of the high technology sector and knowledge based society and knowledge economy in the European Union should be oriented towards solving the following problems:
   - insufficiency and increase in the costs of energy and raw-materials, as well as problems of secure and reliable import of these resources, along with the creation of alternative energy and economies oriented towards alternative raw materials;
   - need for new prospective markets in the European Union, and problems associated with their of its development and introduction;
   - problems associated with the development of the state-of-the-art products, as well as problems of compatibility of the products oriented towards high technologies in the global markets;

- problems of social security, economic well-being, as well as improvement of social, legal and ecological environment.

2. The basis for the creation, development and modernization of the high technology sector, knowledge-based society and knowledge economy in the European Union, is the implementation of universal principles of new quality creation and the creation of new technological quality to ensure the following:

- the development of a new type of society and economy is going under concurrent processes of integration and synthesis;
- when creating the knowledge-based society and knowledge economy in the European Union, incl. the creation, development and modernization of the high technology sector, an integral cultural space should be created;
- when creating the knowledge-based society and knowledge economy in the European Union, incl. the creation, development and modernization of the high technology sector, the strategies oriented towards the integration and synthesis should be created and implemented.

3. In the strategies designed to create a knowledge-based society and knowledge economy, incl. the creation, development and modernization of the high technology sector, the main emphasis should be put on the following priorities:

- rational specialization of national and regional economies, ensuring high compatibility in both the European Union and global markets;
- transformation of national, regional and sectoral economies into the macro – or hyper-clusters and systems of such clusters;
- development of clusters and networks of economic "oases" in the entire European Union.

4. In the situation of further development and enlargement of the European Union, the following provisions should be implemented:

- issues of modernization and compatibility increase for the national, regional and sectoral systems should be tackled in the strategies oriented towards integration;
- issues related to the creation of an integral and undivided knowledge-based society and knowledge economy, incl. the high technology sector, should be tackled within the systems oriented towards synthesis in the entire European Union.

Further scientific research and practice dedicated to the creation of strategies for the knowledge-based society and knowledge economy in the European Union, incl. the creation, development and modernization of the high technology sector, are very promising and important.

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THE LAW ON COUNTERACTING DRUG ADDICTION IN POLAND *VERSUS* THE ILLEGAL TRADE OF NEW DRUGS (BOOSTERS): BETWEEN THEORY AND PRACTICE

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Abstract

The paper shows how, in the context of changes to the law in Poland (which took place in 2010); we still have to deal with the phenomenon of smart drugs. For this purpose, the most important aspects of the related issues have been presented herein, such as: the origin of the phenomenon and its rapid development in Poland and neighbouring countries (Slovakia and the Czech Republic), the legal trade in these substances until October 2010 (through the sale in the so-called smart shops) and then illegal trade (mostly online), changes in the law resulting in a ban on trade in smart drugs; poisoning caused by taking these hazardous substances. Finally, it has been emphasized that when facing the problem of smart drugs, we are not helpless. There is a need to take various preventive measures aimed at reducing this dangerous phenomenon. However, any strategy has to be planned and implemented in many areas of life, taking into account a number of factors, primarily the perspective of public health and using the so-called new media. Moreover, in the near future (the sooner the better), it is necessary to develop a legal way to deal with boosters, which will either completely solve the problem, or at least significantly reduce it, and not only in Poland but also in other European Union countries. It is advisable for the EU countries to align their activities in this regard. Although the European Commission adopts some steps in this direction, the final solution in this case has not been found yet.
The conclusions in this article have been developed mainly based on qualitative analysis of numerous press releases (which frequently tackled the problem of highs), legislation, to a lesser extent, scientific and popular materials. The author of the present paper has also used quantitative test results and other statistical reports, which are the source of knowledge on the extent of legal highs (sales and use) in Poland and other European countries. This problem has not been widely discussed in strictly scientific literature; hence the press and sources of popular science were mostly used. However, this does not undermine their reliability, as the information contained in press releases and popular science publications is

often based on the statements of experts representing various disciplines (physicians, sociologists, educationalists, psychologists, lawyers, parliamentarians, police officers, health inspectors and others) who are professionally interested in one or several aspects of highs phenomenon.
Keywords: *new drugs (boosters), drug addiction, law (legislative changes), illegal trade, victims of smarts poisoning, Poland.*

Introduction

The issue of legal highs is very up to date, especially thanks to the media, which publicized it to a great extent in recent years, especially in 2010. It was abundant in events with highs in the lead role. This situation found its reflection in the press. Most articles come from this period. Now it seems that the issue has somewhat subsided. Less attention is devoted to these substances on the television, radio, in the press and on the Internet. Even though this topic has disappeared from the news, it is still urgent. Almost everyone who has read a little about these substances or watched the news on the television, knows what they are, or at least associates them with certain psychoactive substances (legal until October 2010), similar in their effect to the drug. Compared to the problem of a date rape drug (Daszykowska, Witek, 2011: 39–61; Nowakowski, 2011a: 199–255; 2011b: 257–283) or drug abuse (Rewera, 2011a: 27–50; 2011b: 199–227), the issue of smart drugs was highly publicized and portrayed in the media. It is a relatively new issue, although its origin could be traced back several years.

The aim of this paper is to show how, in the context of changes to the law in Poland in 2010, which de-legalized trade of psychoactive agents with substitutes (highs) in special shops (called smart shops); we still have to deal with circulation of this dangerous substance. In order to illustrate this danger, its most important issues have been analyzed herein, such as: the origin of the phenomenon and its rapid development in Poland and neighbouring countries (Slovakia and the Czech Republic), the legal trade in these substances until October 2010 (through the sale in the so-called smart shops) and then illegal trade (mostly online), changes in the law resulting in a ban on trade in smart drugs; poisoning caused by taking these hazardous substances. The last chapter attempts to provide the answer to the question: are we defenceless in presence of highs issue (in the official nomenclature: psychoactive substitutes)? As it has been shown, we can and should take preventive measures aimed at reducing this dangerous phenomenon. However, any strategy must be planned and carried out in many areas of life, taking into account a number of factors, especially the public health perspective, and for this purpose, it is necessary to use the so-called new media (especially the Internet), and codified law of the European Union, which will be effective in the prevention of illicit

trafficking of legal highs, and also addiction to these substances, to which young people are particularly vulnerable.

The conclusions in this article have been developed mainly based on qualitative analysis of numerous press releases (which frequently tackled the problem of highs), legislation, and to a lesser extent, on scientific and popular materials. The author of the article also used quantitative test results and other statistical reports, which are the source of knowledge of legal highs (sales and use) in Poland and other European countries. It should also be noted that this problem is not often discussed in the strictly scientific literature; hence the press and sources of popular science were used to the greatest extent. However, this does not undermine their reliability, as the information contained in press releases and popular science publications is often based on the statements of experts from various disciplines (physicians, sociologists, educationalists, psychologists, lawyers, parliamentarians, police officers, health inspectors and others) who are professionally interested in the phenomenon of highs in one or several aspects.

Genesis and Development of High Phenomenon in Poland and Neighbouring Countries

Boosters on a large scale and in various forms appeared in Poland a few years ago. However, they were first mentioned in the press in 2000 (Dąbrowa, 2000: 35). During this period the term 'legal highs' was used mainly for energy drinks, which are still very popular among young people. There was an opinion that these drinks are a type of legal highs. They are available in almost any grocery store, and their purchase comes as no surprise and suspicion. They contain small amounts of addictive substances, especially guarana and taurine (Kidawa, 2010: 8–9). In addition, almost every energy drink contains more vitamins and other substances than the allowable daily intake dose (Dopalacze: fakty bez mitów, 2009: 3). Currently, the market offers energy drinks under various names, such as Red Bull, Tiger, Burn, R20+, Cocaine Stimulation, XL Energy Drink, Shell V-Power Energy Drink, Energy Drink Ozone (Korczak, 2009b: 283–286).

In recent years, the notion *highs* – known in the world under many names, including English ones: *designer drugs, smarts, legal highs, herbal highs or boosters* – referring not only to isotonic energy drinks, but to a whole range of different psychoactive substances, which are present in the form of a powder, salt, tablets or herbal mixtures (Malczewski, 2011: 24)[1].

[1] Division of highs into different types is often made by traffickers, what makes it easy for recipients to select a specific product in assortment. For example, herbal highs include any herbal substances, herbal stimulants and psychedelics herbal and plants. However, such boosters as party pills are tablets containing compounds of natural origin (derived from plants), and contain synthetic and semi-synthetic substances (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 175).

The concept of 'legal highs' is not scientific. It was introduced for a broader social use in 2006 by prof. Mariusz Jędrzejko from Pedagogium Foundation. The journalists have contributed to its popularity. Today, the term belongs to the most common issues when discussing the so-called new addictions. The author of the first Polish book about the new drugs is Jarosław Korczak, who made an attempt to define this capacious term, defining it and giving it the name of the new or modern highs (Korczak, 2009a: 7,11).

Boosters constitute a group of at least a hundred different substances with a stimulating, strengthening, hallucinogenic or damping effect. According to Korczak, this concept relates to any substance legally available on the market whose "chemical properties allow you to change / modify the mental and / or physical abilities of the body" (Korczak, 2009a: 11).

The idea behind *designer drugs* is legal marketing and trade of substances having the effect that is similar to drugs. By design, they are intended as a legal alternative to illegal drugs, mimicking narcotic effects. The main difference between the drugs and legal highs is that the latter may not be bound by legal regulations, i.e. they are not recorded in the list of substances controlled by the provisions of the Act on Counteracting Drug Addiction (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011:174–175). However, this situation changed in Poland in 2010.

Boosters' trade began in Poland in 2007 via the Internet (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 175), and a year later the first smart shop was opened in the city of Lodz. Its boom – in terms of both the supply and demand – occurred in the period of two years (from 2008 to 2010), and – as a result of legislative changes – began to disappear from the market, going to the underground, where its trade continues to "bloom" especially on the Internet. We can say with full responsibility that the issue of highs – though legally forbidden – is still a problem in Poland that particularly affects young people.

The interest in this phenomenon in Poland results not so much from the emergence of legal highs shops (also called *smart shops, fun shops or head shops*) as from a series of poisonings, and sometimes death, which came to be loud during the holiday in 2010. In the face of this situation, in a very short period of time, at the beginning of October, the government ordered the police and sanitary inspectors to thoroughly inspect smart shops. As the result, the vast majority of them were closed (Gorczyca, 2010: 3; Szparkowska, 2010: A3).Within a very short time the Polish government received a draft law amending the Law on Counteracting Drug Addiction and the Act on the State Sanitary Inspection. The parliament adopted the new legislation in October 2010, the Senate in November, and finally it was signed by the Polish President (Szparkowska, Wybranowski, 2010: A7; Pezda, 2010a: 8; 2010b: 5; Zawadka G., PAP, 2010: A6; graż, pap, 2010: A5). However, these hasty legislative changes have not solved the issue of legal highs effectively. Traffickers of "legal drugs" have moved their business to the underworld – accepting orders on the phone (ŁUW, 2010: 2), via the Internet (Rąpalski,

Czupryn, 2010: 8; Malczewski, 2010: 48) and out of the country (Zawadka, Wybranowski, 2010: A4; Furtak, 2011: 3; Drzewiecka, 2011: 2).

At a time when it was almost certain that the new rules would come into force (at the end of October 2010), one of the network businesses trading boosters moved to Slovakia and from there they sent goods via mail to Poland. This refers to the Happy Shop which not only sold drug substances via the Internet, but also controlled several stationary shops in the South Poland. According to the Slovak law, at that time the trade in smart drugs was legal, including the sale by sending shipments of goods from Slovakia to Poland. It is worth mentioning that setting up a company at our Slovakian neighbours was not the problem at that time (Zieliński, 2010: 1).

At the turn of 2010 and 2011, trade in boosters flourished also in the Czech Republic, while in Poland it was already illegal. Poles were frequent customers of the Czech smart shops. The owner of one of smart shops in the Czech Cieszyn found that Poles did the shopping there most often, and Czechs and Slovaks were in the remaining positions. The most popular shop trading in these substances was called "Amsterdam-Shop". It was open 24 hours a day. It was advertised as a Czech company with the Dutch tradition, and in fact the owner was a young Pole. The business was moved here from central Poland in the beginning of November 2010. Poles were the most frequent customers of the Amsterdam-Shop (not only young people, but also those between 50 and 60 years old), and considering this fact, the owner chose the location of the shop just behind the Olza river. During the interview, he said that he did not expect a top-down ban on the sale of legal highs in the Czech Republic because the Czechs are a liberal nation (Furtak, 2011a: 3; Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 176; Strauchmann, 2011: 03) with a common belief that each person has his or her reason and free choice (Furtak, 2011a: 3).

The Czech police, however, constantly monitored the situation, as well as the Polish policemen. Finally the Czech Cieszyn authorities recognized the problem. The Deputy Mayor of the city made a request to the Czech Prime Minister to amend the law. He called for addressing the issue of legal highs shops as soon as possible (Furtak, 2011a: 3; (PAP), 2011: A12; Furtak, 2011b: 1; Drost, 2011: 11; (klk), 2011: 27; Furtak, 2011c: 1; Furtak, 2011d: 1). There were four such points of sale in the Czech Cieszyn open around the clock (Furtak, 2011e: 5). At the beginning their clients were only Poles, but then more and more of the goods were bought the Czechs. Therefore, the authorities began to "sound the alarm" observing a growing problem. As a result, the Czech government handled the problem (Furtak, 2011a: 3; 2011b: 1; 2011c: 1; 2011d: 1).

In March 2011, the Czech government supported a ban on sale of 30 substances that are included in the smart drugs. An accelerated project was made by the representatives of all political parties and hit the agenda of the Parliament. The ban on sale of psychoactive substances in the Czech Republic entered into force on 22 April 2011 (Klimaniec, 2011: 9; Furtak, 2011e: 5), thus five months after the boosters were banned in Poland.

Illegal Trade in Smart Drugs

The new legal regulations in Poland and the Czech Republic do not definitively resolve the issue of smart drugs. In Poland, a few months after the entry into force of the amended Law on Counteracting Drug Addiction and the Act on the State Sanitary Inspection (effective since 27 November 2010), the phenomenon of highs was (and still is) in the so-called underground. Although smart shops are closed, these drugs can be purchased on the Internet. They are presented on the foreign websites where information is posted – what is interesting – in Polish language (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 177; Blikowska, 2011: 16–17), or by the phone or in regular stores "under the counter" (Markowski, 2011: 12; Drzewiecka, 2011: 2; Kącki, 2010: 5).

The survey carried out by the Public Opinion Research Center (on behalf of the National Bureau for Drug Prevention) in late 2010 on the use of psychoactive substances by young people aged 18–19 years, shows that the removal of smart shops was the customs move. The research proved that this store had been visited by more than every fourth student (27 percent), and 40 percent of them made the purchase. The most frequently purchased substances – herbal mixture called Typhoon and pills or tablets. In 2010, the interaction of young people with dangerous substances was intensified. The research results showed that in this year 11.4 percent of students admitted to having a contact with smarts (Malczewski, 2011: 23–24).

The author of the research report mentioned above – Artur Malczewski from the National Bureau for Drug Prevention – evaluated these results positively by saying that after the closure of smart shops, boosters' availability decreased. However, the Office Head Peter Jablonski said that the research covered the period when the highs were still legal, thus one cannot be sure that young people do not provide themselves with smart drugs in some other way. According to him, after banning smart shops, the trade developed in the network and the number of online customers of shops trading boosters increased (Zawadka, Wybranowski, 2011: A9).

Other results obtained from a telephone survey conducted for the European Commission in May 2011 (on a random sample of over 12.3 thousand respondents aged 15 to 24 years throughout the European Union) showed that the highs were used by 9 percent of young Poles (while the European average was 5 percent). Poland ranked the second in the EU (after the Ireland with 16.3 percent) in terms of the number of young people who use harmful synthetic substances. This problem (high percentage above the European average) was also reported in Latvia (8.8 percent), the United Kingdom (8.2 percent), Luxembourg (6.8 percent), Slovenia (6.6 percent), Estonia (6.2 percent), and Portugal (5.8 percent). Brussels, informing of the results of the survey, presented some other alarming data, which showed that the number of boosters on the EU market increased. In 2010, a record number – 41 of new substances was observed. That is an increase of

almost 50 percent when compared with the situation in 2009 (in the EU market there were 24 new psychoactive substances) (Struzik, 2011: 31, 33–34; guu, 2011a; ika, 2011). These results show that the problem of smart drugs is not typically Polish.

This problem still exists, but it is difficult to detect because the illegal trade of smarts takes place in the so-called underground. It is still possible to purchase these specifics and this fact does not have to be recorded in the official statistics. It is difficult to estimate the scale of the phenomenon, because consumers of boosters do not admit the fact of buying them. It is also unlikely that they would point the place where they obtained these substances.

The sale of illegal psychoactive substances on the Internet is a warning signal, and indicates that the choice of the global Internet is not accidental and should not be underestimated. The Internet makes it easy to reach a wide group of receivers, allows the sale, and the rapid distribution of products and it is a highly effective and relatively inexpensive tool testing a potential market and its size. It allows for obtaining the feedback from customers: opinions, comments, expectations and recommendations. It also reaches an appropriate target group – young people who have a tendency to experiment, have access to the network and spend there a lot of time. It can be said that the Internet is now a trendsetter and sets the paths of smart drug industry's development (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 177–178).

Closing of Smart Shops in the Light of the Law

Taking into consideration the phenomenon of liquidation of smart shops, it could be said that the Polish government was only partially successful in the fight against the so-called new drugs. The fact that fewer and fewer intoxicated people were admitted to intensive care units could be considered as part of success, whereas the failure is that the highs are still available and anyone who feels like trying them, can order smarts through the Internet (Kęskrawiec, 2011: 18).

According to the parliamentary experts, trade in smarts is prohibited, but the acquisition is lawful. It would be violated only if we treated someone to a smart drug. Thus, the customer's situation is much better. They do not commit a crime, as they receive false information from an online store and therefore they are not aware of the actual composition of the product. It is a logical legal solution operating for the customer's benefit. If it was enough to obtain a prohibited drug to break the law, it would enable a series of manipulations. The seller could, for example, include a portion of the drug in the book ordered from a bookstore that for some reason (e.g. personal one) would cause problems to him (Kęskrawiec, 2011: 18).

The act, which came into force on 27 November 2010, is valued differently. As a rule, it is accompanied by ambivalent views. On the one hand, one observes its gaps. However, the mere fact that the act saw the light of day is already a success. The situation that there is no

permit for the sale and importation of these substances from abroad should be considered a positive solution (Świderska-Kopacz, 2011: 2), which severely limits the dangerous phenomenon of boosters' trade carrying a serious threat to individual and public health[2].

Closing of almost 1400 highs stores in October 2010 did not resolve once and for all the burning social issue. There were the voices that they were not closed in accordance with law (Brzozowski, 2010: B12) and their owners would be able to apply to the court for compensation from the state. 600 of them actually did it, referring to the decision of the Chief Sanitary Inspectorate (CSI). According to lawyers, the CSI should not have made one decision to close all the shops, but was obliged to issue as many decisions as the number of stores they wanted to close (Kryszkiewicz, 2010: A1; guu, 2011b).

In February 2012 the first judgments were made on the so-called smart drugs. The Regional Administrative Court in Warsaw decided that the Chief Sanitary Inspector may order an immediate withdrawal of smarts from the market because of possible health risks. After closing the shops, however, they were required to prove that these substances were a real threat (Brzozowski, 2010: B12; Frey, 2012: C1).

However, the court found that the decision of the Chief Sanitary Inspector of October 2, 2010 is valid. It is a general administrative act by its nature. The Chief Sanitary Inspector has the power and duty to respond, even to only hypothetical threats. They are authorized to do it by the provisions of the Act on the State Sanitary Inspection. In accordance with this Act, the Chief Sanitary Inspector could apply immediate preventive measures (Ustawa z 14 marca 1985 r. o Państwowej Inspekcji Sanitarnej, Dz. U. z 2006 r. nr 122, poz. 851 ze zm.). After the implementation of preventive measures (after closing boosters stores), however, they should have proved that these substances are indeed a real threat to health and life, rather than to vainly argue that they are, without relying on the results of toxicology tests, the number of poisoning, medical interventions and people hospitalized (Frey, 2012: C1). No evidence from the Chief Sanitary Inspector proving that specific products are harmful to health and life, open to owners of closed smart shops a way to assert their claims, and not just property ones (due to lost profits resulting from the closure of commercial activity), but also non-pecuniary rights (resulting from the damage to personal goods) (Pietryga, 2012: A2). It is worth noting that by April 2012, 40 proceedings were pending on the smart drugs in the administrative courts, and in August 2012 there were 100 cases waiting for judgment (p.mal, 2012; GROH, PAP, 2012: 6; Skomra, 2012: 2).

Finally, it could be said that the legal solutions that have been adopted in Poland, are not fully satisfactory. One may be tempted to set the thesis that optimal performance is to amend the law, if it has nothing to do with the complexity of reality. A good law must

[2] Bogdan Więckiewicz examines these risks in relation to family life and the child's position in the family (Więckiewicz, 2010: 79–87).

keep pace with the changing social situation. Without it, we are exposed to ambiguity, which can be a breeding ground for illegal activity.

Poisoning with Smart Drugs

Six months after the entry into force of the amended Law on Counteracting Drug Addiction and the Act on the State Sanitary Inspection the problem of smart drugs had not been resolved, despite assurances of the Minister of Health that the number of poisoning with these hazardous substances decreased. According to official statistics of the Chief Sanitary Inspectorate – the number of poisonings with boosters decreased during the period from October 2010 to February 2011. In October, 258 cases were recorded, in November – 60, in December – 21, in January of the following year – 13, and in February 2011 only 8. Doctors from the Pomeranian Toxicology Centre in Gdansk, however, were sceptical of the statistics, claiming that smarts have become prohibited substances, and therefore it is difficult to expect anyone to admit to taking them. Often the person, who experiences any complications after ingestion, defends himself/herself against the doctor and claims that someone put something into their drink for example. Thus, decreasing data relied upon by the government, is not completely reliable (Ambroziak, 2011: 5).

After a period of relative stability as regards the scope of highs poisoning that took place in 2011 despite the ban since June 2012, the trade in synthetic stimulants began to revive. For the first time since October 2010, the number of drug-related hospitalizations increased. Although the number of detoxification interventions was only about 5 percent, which is something that health care system had to deal with two years earlier (in mid-2012 about 25 cases a month, while two years later there were about 500 per month), the mere appearance of the upward trend in 2012 became a concern. A larger number of poisonings means more spending from the state budget for patients' treatment. A possible increase in poisonings with synthetic stimulants was probably associated with the summer break, during which young people have more time and are looking for a thrill. Another probable reason was the increased availability of boosters: there are in fact more new "underground" points of sale. It was found especially in the provinces of Silesia, Lodz and Kujawy Pomorskie Province. The sanitary and epidemiological station was frequently informed of the suspicion that trade in boosters was run. The sale takes place mainly on the Internet, but also in stationary stores where they are offered in addition the core business, e.g. in computer stores they are sold as substances for monitor clearing (Otto, 2012a: A3; 2012b: A1) or in souvenir boutiques – simply as "common" souvenirs[3].

[3] At the end of June 2012 in Piotrkow Trybunalski policemen were sent to the store where under the name of "Souvenir shops" were offered boosters. The study drug tester confirmed that some products were cannabis and amphetamine derivative (Czerwiński, 2012: 1).

The problem is getting worse, because these drugs are becoming more and more complex in their composition (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 177), which makes it difficult to quickly identify what exactly a young person has been poisoned with. Specialists from the National Institute of Drug Administration found that the highs are becoming more and more toxic. While in 2010, 17 percent of the highs brought to the Institute were composed of only one substance, two years later, they consisted of five or more components (Otto, 2012a: A3). Jan Bondar – a spokesman for the Chief Sanitary Inspection, confirmed that in 2012, 24 new psychoactive substances were identified in the composition of drugs constituting health hazards, which have been added to the list of banned substances in the Annex to the Act on Counteracting Drug Addiction (Otto, 2012a: A3).

Toxicologists from the Department of Acute Poisoning Institute of Occupational Medicine in Lodz noticed two changes that distinguish persons poisoned with highs in 2012 from those poisoned in 2010. Firstly, in 2012, more frequent intoxication was observed among adult people – between 20 and 30 years of age (which, incidentally, had already had experience with psychoactive substances), while in 2010, medical assistance was mainly provided for teenagers who took dangerous substances for fun, out of curiosity or to impress their peers. Secondly, in 2012, doctors observed other symptoms in patients than two years earlier. In 2010 – the dominant symptoms were agitation and aggression, while two years later – fear: most people were terribly afraid after taking the highs. A common feature of poisonings in 2010 and 2012 was, however, that almost all admitted to the detoxification after taking smart drugs had increased heart rate and high blood pressure (Czerwiński, 2012: 1).

Since the closure of the smart shop, another disturbing phenomenon has been observed. Piotr Burda, a national consultant in the field of toxicology, said that young people have been increasingly looking for new ways to intoxication to reach such as the windscreen washer fluids or metal cleaners. They also experiment, for example, with drinking mascara lotions and even liquids for intimate hygiene (Watoła, 2012: 7). Undoubtedly, this situation is dangerous for both their health and life.

Preventive Measures against the Highs

In the introduction to this chapter, it is worth asking the question: how to prevent poisoning with smart drugs and other substances (hazardous highs substitutes), which have psychoactive effects?

While developing strategies for action against highs, a number of factors should be considered that may influence the implementation of solutions, which must be thought over carefully, and which should complete anti-drug policy, not to be its main tool. First of all, it is necessary to look at the problem from a public health perspective. Banning individual compounds (adding them to the list of controlled substances) should take a

number of measures of preventive and educational character (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 179)[4].

In this regard, it is worth using the Internet. Today, it is quite a common source of information on drugs and any substances having a similar effect. In Poland, the knowledge about drugs is acquired mainly from online forums and social networking websites. They contain current information provided in a more accessible way for the average user than on the government website www.dopalacze.info.pl, as well as their form is interactive – it allows for exchange of views, experiences, insights and knowledge, including science. The most complete and current information about the highs market comes from their users. However, it should also be borne in mind that a lot of information in the network is not very reliable. Hence, there is an urgent need to build such an information service that would allow for both access to reliable data base on the smart drugs and rapid, effective communication with people who need special help and support[5].

It is also worth considering whether prophylactic measures against boosters should have a character of struggle or rather of a peaceful campaign. As we noted above, the problem of smarts and all drugs cannot be limited only to the issue of regulatory and legislative solutions. This issue should also be taken into account in public policy, education[6], substance abuse prevention, health education and health promotion. In view of its multi-dimensionality, the solutions proposed in one aspect will always be partial. To be effective it is necessary to act in multifaceted manner and get rid of complexes and drug phobia, and above all, to be active. In the era of rapid and comprehensive information medium – the Internet, it is essential to use this tool for effective prevention and fight against boosters and agents having a similar effect (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 175).

[4] First of all we need a good campaign on the effects of use of these substances. In 2011, the sanitary and epidemiological station distributed leaflets and educational materials (e.g. film "Stop to Highs") in hundreds of schools. In 2012, its inspectors visited more than a thousand educational institutions. Purchased by the government, mobile learning points "Stop to Highs" were present at concerts, festivals and other public events, such as the Woodstock festival in 2012 (Otto, 2012a: A3).

[5] It is worth mentioning the solutions, which were adopted in Great Britain regarding this matter. There has been launched a website "talktofrank.com", a compendium of knowledge – not only about the available substances, the potential risks of their use, slang and legal terms – but also allows people in need to quickly contact with professionals (Kapka-Skrzypczak, Cyranka, Wojtyła, 2011: 179).

[6] Jadwiga Daszykowska recalls various examples of action implementing a change and innovation in the Polish school (Daszykowska, Rewera, 2012: 42–45). As a part of these strategies, prevention measures against the smarts can be taken into account.

Conclusions

Amendments to the Act on Counteracting Drug Addiction in Poland, which were introduced in 2010 to deal with the phenomenon of legal highs, proved to be an ineffective solution, because we still have to deal with the illegal trade of such specifics and we learn from the media about the victims of poisoning with *smarts.*

This amendment to the Act, which delegalized boosters, introduced a new concept of "alternative measures". Pending its entry into force, the boosters were considered legitimate products, which are called replacement drugs. Since 27 November 2010 the turnover of boosters (marketing and sales) has been legally prohibited. The very concept of smarts is not associated with the "legality" or "illegality", and basically it is interpreted by the law. It can be argued that the legal status of "new drugs" has been equated with the status of drugs. Under the Polish law, smarts in the strict sense (understood as in other countries, e.g. Germany or the United Kingdom) could be considered the measures containing only permitted substances, which are not on the banned list in the Annex to the Act on Counteracting addiction (I am thinking here primarily of energy drinks, which can be described as quasi-highs, and actually – having stimulatory effects or stimulants such as coffee and cigarettes).

According to the amended Act in 2010, which introduced the concept of 'replacement measures', this is any measure that is used for intoxication (for example, if someone sells a washer fluid, which is designed to wash car windows, with the intent that the customer uses it to be intoxicated, in the light of the amended Act, the product will be treated as an afterburner. Therefore the intention of the seller as to the destination of the product (target of its use) is important, not only the substance itself – how it was interpreted before the amendment to the Act became effective. To summarize, boosters have become illegal in Poland. The term 'smarts' does not refer only to substances, which are currently on the banned list, but also depends on the awareness of the seller as to the likely utilization of the substance by a customer for intoxication.

The Polish solution adopted in the Act on Counteracting Drug Addiction in 2010 is a specific legal oddity in the field. In Western Europe, fighting and prevention in the field of trade in boosters and their relationship with drugs comes down to the fact that the former are allowed, unless they contain substances on the banned list. In contrast, the latter (drugs) are mostly illegal. Control and prevention of smarts, e.g. in the UK is limited to continuous monitoring and control of highs outlets (staff and customers) and to the study of products sold for the presence of prohibited substances. If their composition is found to contain chemical compounds dangerous to health and life, then the product is withdrawn from the market, or – in the case of a dangerous relationship – put on the list of prohibited substances. Meanwhile, the Polish solutions are quite specific in this area. It is worth noting that in November 2010 they were like in other

European countries. Now, with the amendment of the Act on Counteracting Drug Addiction, they differ from the solutions commonly used in Europe. Are the solutions adopted in Poland indeed effective in fighting replacement measures? As it was mentioned above, time has shown that they are not entirely effective, as evidenced by the constant presence of new drugs (the camouflaged names, such as flavouring agents to computers or fertilizers for plants) on the black market (the Internet and other outlets, such as computer stores or in gift or souvenir boutiques).

Statutory record adopted in the amended Act on the Counteracting Drug Addiction is unclear and unambiguous. It can be interpreted differently (even by the author of the paper) and primarily used by smart traffickers. It is probably because it raises doubts and is critically assessed by experts not only in the field of law. It is difficult, therefore, to consider the solutions in force addressing the afterburners and undertaken in Poland as perfect.

Therefore, in the future (the sooner the better) it is necessary to develop a legal framework to deal with boosters, which will either completely solve the problem, or at least significantly reduce it, and not only in Poland but also in other European Union countries. In addition, it is advisable for the EU countries to align their activities in this regard. Although the European Commission adopts some steps in this direction, as evidenced by the statement of the Vice-President and EU Commissioner for Justice, Viviane Reding[5], the final solution in this case has not been constituted.

Based on the obtained materials, it was possible to perform both qualitative and quantitative examination of the phenomenon of highs, as well as to draw conclusions, from which it results that the issue of highs is still not fully resolved and it is a threat to public health. The changes in the law, which were introduced in 2010, proved to be ineffective in solving it (Amended Act on Counteracting Drug Addiction in Poland, proved to be partly an effective solution, because we still have to deal with the underground trade of boosters, and we learn from the media about the victims of smarts poisoning: the number of poisonings with highs began to rise from the middle of 2012 and this trend is still increasing).

[5] "Smarts constitute a growing problem in Europe and threaten most of all young people. In the event of a borderless internal market to solve this problem common EU rules are needed. Today we offer a firm EU law on new psychoactive substances for the EU to act more quickly and effectively, including temporary withdrawal of harmful substances from the market with immediate effect (European Commission, 2013).

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Changes and opportunities: investigating links between theory and practice in finance

PRACTICAL PROBLEMS OF IMPLEMENTING THE ENVIRONMENTAL ACCOUNTING WITHIN ENTERPRISES

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Abstract

The paper presents an overview of goals, scopes, framework of an idea to combine the results of integration of Life Cycle Assessment and Life Cycle Costing research. Traditional accounting systems (financial and management) provide incomplete data, lack data and include hidden environmental costs in administration and overhead accounts and sometimes allocate them to inadequate products, objects. The purpose of this research is to gain an understanding of the root causes of blockades and problems associated with the development of environmental accounting in enterprises. The study employs interviews with operating officers, environmental managers and accounting officers of Polish companies from Lower Silesia. To improve the generalization of the results and for the future research, the comparative research among different industries, countries and regions should be carried out. Development of environmental accounting requires increasing green and sustainability – related knowledge and generating a conception of corporate responsibility inside an organization. This paper contributes to a deeper understanding of the influence of organizational learning mechanisms and the role of local authorities in developing environmental accounting. It may be said that large-scale implementation of environmental accounting solutions in Poland will need the actions from the roots: extensive education and financial incentives. Questionnaires, case analysis and deduction, as well as literature research were used in the article.

Keywords*: environmental accounting, accounting, green accounting, management accounting.*

Introduction

Currently, not only big, international and transnational companies, but also small and medium-sized companies worldwide pay attention to environmental protection and related sustainable development. Sustainable development is frequently described as an economic activity ensuring fulfilment of the needs of present generation while not

limiting the opportunities of future generations to fulfil their needs. There are three facets of sustainable development: economic, social and environmental. Owing to the above-mentioned idea, the companies are more aware of the fact that their decisions concerning products, services and processes have considerable influence on the natural environment. The goal of this article is to specify the problems faced by companies while implementing environmental accounting in their system; the above translates into practical incorporation of the sustainable environmental development policy into managerial decisions. Questionnaires, case analysis and deduction, as well as literature research were used as the research methods.

Environmental Accounting

The notion of environmental accounting or green accounting has got many definitions, meanings and uses in theory and in practice. Within the basic understanding environmental accounting can support national budget accounting systems, financial accounting system, cost accounting, as well as management accounting such as:

- assessing and disclosing information related to the environment in the context of financial and management reporting;
- environmental impact assessment and full costs of a product;
- booking of inventories and flow of natural resources in naturalistic and financial conditions (NRA);
- aggregation and internal reporting of accounting information;
- relating environmental data with cash data in the context of sustainable development of accounting (Volosin, 2008: 2–5).

Within the understanding of American GAAP, environmental accounting is defined as a method of estimating and public reporting of significant environmental obligations of companies, incl. determination of environment-related costs.

Environmental protection costs (environmental costs) have got a few meanings in practice and literature; however, it is possible to distinguish two main lines of understanding:

- referring only to the costs directly affecting profits of a given company, sometimes referred to as ‘private costs’;
- including costs for individuals, society and the environment – the company is not directly responsible for such costs; they are called ‘social costs’.

At the same time, environmental protection costs are economic costs incurred as result of the use of the environment such as eco-taxes, costs of waste emission and control, costs of eco-product marketing (Russo, 1999: 243).

Environmental costs should be listed separately in entities' accounting systems due to their relation with, among others, efficiency and management optimization, in particular:

- Environmental costs can be reduced or eliminated as result of business decisions by investing in green technologies (i.e. process, product re-designing).
- Environmental costs are omitted or concealed in traditional systems.
- Environmental costs may be a basis for generating profits on sale of waste and pollution, alienable rights or licenses of 'pure' technologies by-products.
- Managing the environmental protection costs may increase the environmental management efficiency that is beneficial for human health.
- Understanding of environmental costs may facilitate calculations of product prices and products which are more environmentally-friendly.
- Environmental accounting may support the development of a company as an environmentally-friendly institution.
- Environmental costs may be reduced or eliminated owing to changes in the product design, flow of resources, re-design, and improvement of operation and product support services (Russo, 1999: 228).

According to the information provided above, one may assume that managing staff of every company should support setting up the so-called cross-functional teams dealing with effective implementation of environmental accounting. Firstly, environmental account may include a new approach to the company's costs related to environmental protection, which will have an impact on the process efficiency and effective decision-making. Secondly, setting up teams of designers, chemists, engineers, production managers, operatives, financial and accounting staff, environmental engineers and sales persons ensures better exchange of information and creating better and more optimal projects (IFAC, 2005: 19).

Implementation of environmental accounting is related to the application of strategic management systems with the option of distinguishing, among others, the environmental costs. These systems include:

- Activity-Based Costing;
- Activity-Based Management;
- Total Quality Management;
- Total Quality Environmental Management;
- Business Process Re-Engineering;
- Cost Reduction;
- Cost of Quality Model;
- Design for Environment;
- Life Cycle Assessment;
- Life Cycle Costing;
- Environmental Life Cycle Costing;
- Target Costing (Kużdowicz, P. & Kużdowicz, D., 2012: 170–174).

Materials and Methods

For the purpose of the research, a questionnaire was used as a tool. The decision on the application of this form of research was taken on the basis of the following aspects:

- A questionnaire as a research technique allows obtaining the data necessary to give answers to the questions relating to the subject matter for research.
- The lack of substantive obstacles which would justify the application of another technique.
- The possibility of obtaining the research materials which do not require supplementing with other research techniques.

Additional criteria which were decisive of the use of a questionnaire as a research tool are as follows:

- research conducted by one researcher (without a team's support);
- low costs;
- lowering the error of interviewers' bias;
- respondent's anonymity;
- giving well-thought answers;
- consultation possibility.

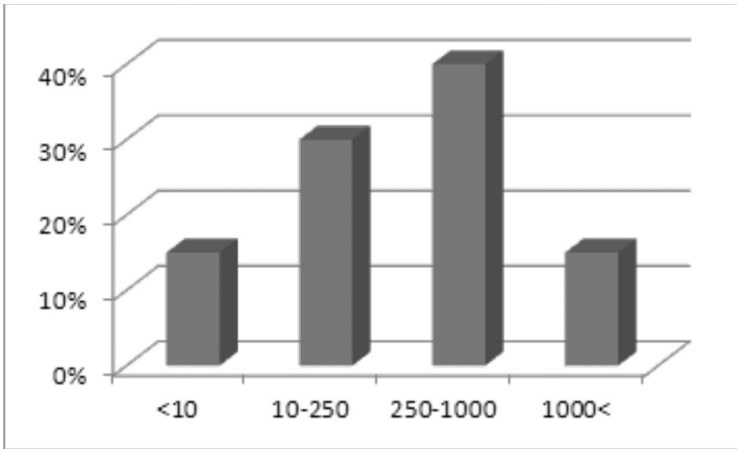
In December 2013, a questionnaire was sent via e-mail to entities from the production branch of the industry at Lower Silesia. Eighty-six filled out questionnaires were received. The statistical material obtained constituted the effect of the stage called statistical observation. Prior to the commencement of the stage of statistical analysis, the filled out questionnaires were subject to formal assessment (the number and completeness) and subject matter related assessment (logical assessment of the quality of questionnaires filled out by respondents). The questionnaires, used for the purposes, contained 5 questions and they related to:

- the employment structure;
- separating environmental costs;
- the application of modern techniques and management accounting systems supporting environmental accounting;
- the preparation of environmental reports;
- defining problems of implementing the environmental accounting.

Results and Discussion

Analysing the employment of organizations subject to the research, attention should be paid to the fact that they represent all groups of companies, starting with big ones,

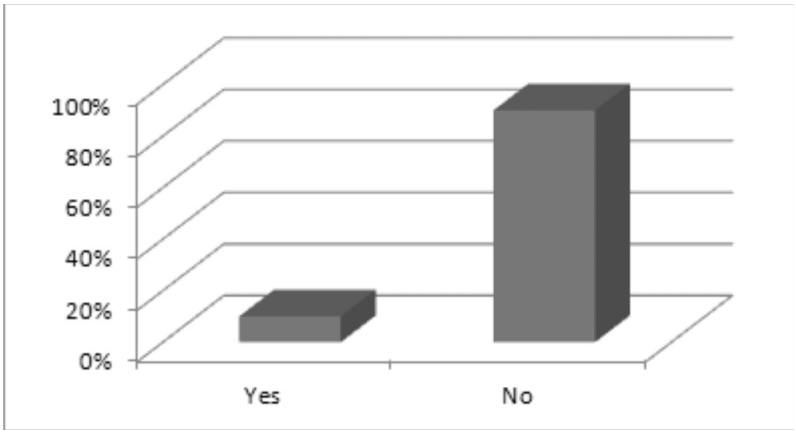
which constitute the biggest percentage and including small ones. 40% are the organizations belonging to the group of big companies, employing from 250 to 1000 people. There are 15% of companies employing more than one thousand people. The entities ranked to the medium enterprise group were represented by 30%. 15% were ranked as small and micro enterprises. The size of organizations as per the number of employees is presented in Figure 1.



Source: own study based on research results

Figure 1. Employment structure at entities subject to the research (12.2013 in Lower Silesia)

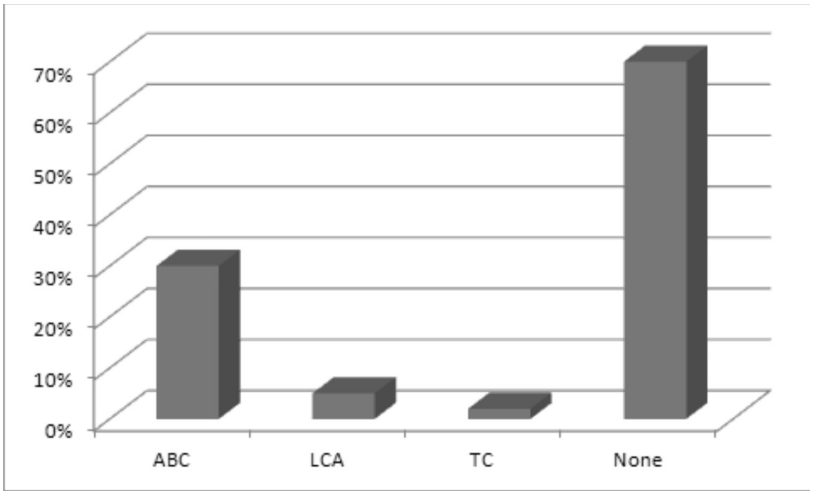
Taking into consideration the separation of environmental costs, the companies which failed to keep such records on purpose definitely dominated (90%). Only 10% of respondents answered that they separated "4" costs which could be considered environmental costs (Figure 2).



Source: own study on the basis of research results

Figure 2. Environmental costs (12.2013 in Lower Silesia).

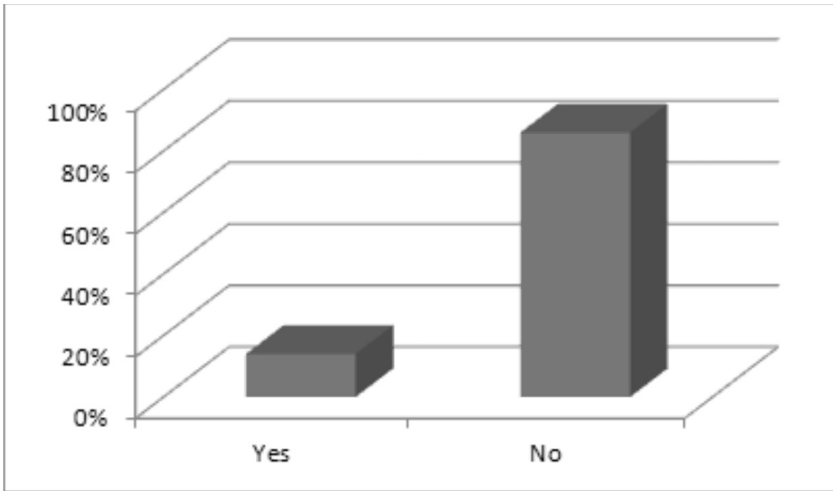
Analysing the responses to 3 questions concerning the implementation of new techniques and management accounting systems supporting environmental accounting, very low awareness of these techniques may be found. Activity Based Costing had 30% of entities subject to the implemented research, Life Cycle Assessment – 5%, Target Costing – 2%, whereas the companies could have marked a few responses to this question (Figure 3).



Source: own study on the basis of research results

Figure 3. Modern techniques and management accounting systems in researched entities (12.2013 in Lower Silesia)

Pursuant to the requirements of the Ministry of Environment, the environmental reports are prepared by merely 14% of researched entities representing the production sector (Figure 4).



Source: own study on the basis of research results

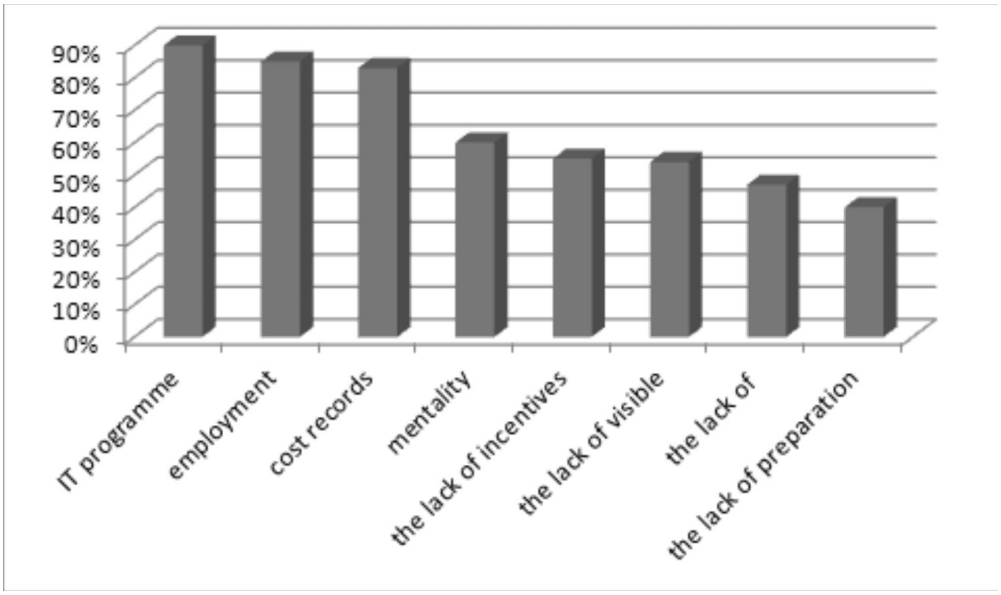
Figure 4. Environmental reports in researched entities (12.2013 in Lower Silesia)

Question 5 concerned defining the problems which occur or may occur from the point of view of the company, with the implementation of environmental accounting, including identification, records and environmental costs analysis. Additional problems with the preparation of an IT model was indicated as the biggest problem (90%), additional costs of employment of a specialist (85%), as well as records of environmental costs (83%).

The subsequent places included:

- employee mentality (60%);
- the lack of system incentives (55%);
- the lack of clear overlapping on increase in sales (54%);
- the lack of systematic trainings (47%);
- the lack of documentation preparation (40%)

The results were presented in Figure 5



Source: own study on the basis of research results

Figure 5. Problems of implementing the environmental accounting in researched entities (12.2013 in Lower Silesia)

Conclusions

On the basis of presented research results it may be suggested that the entities aptly diagnosed problems of promoting the solutions regarding environmental accounting. Most entities cannot notice real overlapping on the increase in their competitiveness and revenue on sale by separating this accounting model. They are afraid of incurring additional fees because they think that it involves expensive IT systems.

The results obtained from questionnaires allow for making the following comments and suggestions:

- Despite great promotion of sustainable development in the media, the companies approach this issue with distance and uncertainty.
- The education process relating to environmental accounting solutions should be strengthened.
- All problems associated with the implementation of environmental accounting mentioned by the entities are becoming the basis for the change of the way of thinking and reaching companies with concrete solutions.
- It should be emphasized that there is no system of incentives functioning that would promote a separate analysis of environmental costs.

To sum up, it may be concluded that the implementation of environmental accounting solutions on a large scale in Poland will require the actions from the core: extensive education and financial incentives.

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THE RESULTING CATEGORIES IN THE VALUATION OF LONG-TERM SERVICES IN THE CONTEXT OF PROPOSED AMENDMENTS TO THE INTERNATIONAL ACCOUNTING STANDARD 18 "REVENUE"

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Abstract

A characteristic feature of long-term services is that their performance is commenced in one accounting year and completed in another. A long time-frame of rendering such services translates itself into the necessity to perform the assessment of all contracts being performed for successive balance sheet days. The valuation consists in applying one of the two acceptable methods. The effects of this valuation mainly impact the revenue item and possibly costs item in the profit and loss account and they become recognized in the balance sheet and the note. The amendments concerning the revenue recognition presented in the draft International Accounting Standard 18 "Revenue" (IAS 18) stipulate the necessity to prepare oneself for the change in the previous approach. The proposed solution to the most important issue in the context of valuation of long-term services is the need to separate the obligations under a signed contract, and pointing when the transfer of control over the result of each extracted obligation is happening. The effect of new solutions would be the possibility to apply the new costing method (currently non-authorized substance) and greater ability to "move" the disclosure of the financial result in the course of implementing the service.
The objective of this article is to characterise long-term services by distinguishing them from other services, to present the current valuation methods and the impact of the proposed amendments to IAS "Revenue" on the valuation of the resulting categories of long-term services being performed. To attain the set objective, the author of the present article studied professional literature and used the method of deduction, induction, license application by analogy, as well as performed case analysis.
Keywords: *long-term services, methods of the valuation of long-term services, revenue.*

Introduction

The valuation of long-term services being performed as of the balance sheet date is subject to specific valuation in accordance with Article 34a of the Act on Accounting and the International Accounting Standard 11 “Construction Contracts” (IAS 11) (The Act on Accounting 1994; The International Accounting Standards 2011). This valuation consists in the recognition of revenue and corresponding costs according to two acceptable methods: percentage of the completion method and the method where revenue is recognised only to the extent of recoverable contract costs. The approach developed in practice for these specific services will have to change in case when a new standard concerning revenue comes into force (Revenue from Contracts with Customers, 2011). Pursuant to the wording of the draft standard major, the changes, which will have direct impact on the recognition of financial results of analysed services, are about to take place. This standard is supposed to supersede the current IAS 11 and IAS 18 “Revenue”. The most important amendments to the scope of long-term service valuation include the need to separate the obligations of service performance and new methods of determining the moment of revenue recognition.

The purpose of the article is to present the features that distinguish long-term services from other services and the methods of their appraisal, as well as the most important amendments proposed to the draft of the International Accounting Standard 18 “Revenue” from the point of view of the valuation of analysed services and illustrating the impact of the proposed amendments on the disclosure of financial results, using the selected long-term service as the example. To attain the set objective, the author of the present article studied professional literature, applied the method of deduction, induction and license application by analogy, as well as performed case analysis.

Characteristics of Long-term Services

The basic characteristic of long-term services is that the implementation of all activities falling under the contract starts and completes in various accounting years. Therefore, in companies rendering such services, making the valuation of all services being performed is one of the most important elements of balance sheet works. The method of assigning revenue and corresponding costs to particular accounting periods throughout the service performance period is decisive for the financial results of the successive years. Other characteristics (apart from the commencement and completion of the service in various accounting periods) distinguishing long-term services from other services include:

- high service costs, which usually involve the necessity to obtain external sources of financing during the service performance;

- individual nature of the service, uniqueness (performance results are strictly defined in the contract);
- complex system of determining the final price;
- the necessity to employ subcontractors for some works, which usually complicates the contract settlement.

The Contracts for the execution of construction works may be either lump sum contracts (with the price agreed in advance) or "costs plus profit margin" (where the settlement takes place on the basis of incurred economically substantiated costs to which profit margin is added). In business practice mixed contracts may be encountered, for instance contracts "costs plus profit margin" with the agreed limit of the price increase.

The work – in- progress schedule and the costs budget are the integral parts of the contract. The schedules of particular contracts are subject to negotiations along with contract terms and conditions. They are flexible in nature, which means that schedules may be shaped during the contract performance in accordance with the parties' will. The ease to make changes in the schedule results in difficulty to verify it, especially by the third parties. This, in turn, is the cause of difficulties in determining credible budget. Each change in the schedule should be reflected in the cost budget.

The Methods of the Valuation of Services being Performed

Four methods of determining revenues and costs from long-term services not completed as of the balance sheet date are described in the reference literature. The methods include (ed. Kowalak, 2007: 54–73):

- invoices issued;
- contract performance;
- percentage of completion method;
- the method in which revenue is recognised only to the extent of recoverable contract costs.

Currently the valuation of long-term uncompleted services as of the balance sheet date in accordance with the Polish balance sheet law and solutions stipulated in IAS 11 should be performed by applying one of the last two methods: the percentage of completion method or the method in which revenue is recognised only to the extent of recoverable contract costs. The recognition of revenues and costs, and simultaneously the financial result, takes place in case of the third method in accordance with the actual percentage of completion of works. According to the last method, by approaching the issue of valuation more cautiously, incurred costs are recognized in the financial statements and revenues are recognized only up to the amount of costs; the profit is not recognized. And in case of anticipated loss, it should be recognized immediately. The

percentage of the completion method is considered the basic one, while the method in which it is considered – the alternative one.

Proposed Amendments to IAS 18 "Revenue"

Currently the discussion on the latest version of the draft standard 18 "Revenue" is going on. It includes significant changes in the scope of conditions for recognizing revenue (Revenue from Contracts with Customers, 2011). The main assumption of the standard is based on five steps of demonstrating and recognizing revenue which are presented in Table 1.

Table 1

The Hierarchy of the Steps of Revenue Recognition as per the Draft IAS 18

Step No.	Specification
1	Identification of the contract with the customer (merging and dividing contracts)
2	Identification of particular obligations to be performed within the framework of the contract
3	Determining transaction price (valuation)
4	Allocation of the transaction price to particular obligations to be performed within the framework of the contract
5	Recognition of revenue at the moment of fulfilment of each obligation

Source: Own study on the basis of "Revenue from Contracts and Customers, Exposure Draft ED/2011/6 {IFRS Foundation 11.2011]

From the point of view of this study, steps 2 and 5 are the most important. According to the author of the draft standard, the implementation of step 2 consists in taking a decision on the necessity to identify particular obligations to be performed or considering all works executed as one obligation. The decision is of great importance because it determines whether revenue recognition will take place after the implementation of each separated obligation or once, after the completion of all obligations. In general, revenue will be recognized when the fulfilment of service obligation by the contractor takes place, so when the contractor meets its obligations towards the employer, consisting in the delivery of goods or services, which usually takes place after "handing over control" to the employer. In the last revised version of the draft, the 'handing over control' was not defined. Only the factors decisive for handing over control were listed. The instructions are included and should be considered by the entity to be able to decide whether control is handed over continuously, over time or whether the handing over takes place at one particular moment.

The last version of draft IAS 18 describes the criteria to be followed in the assessment of the manner of fulfilment of the obligation resulting from the contract identified at

step 2. If the manner of its fulfilment guarantees continuous handing over of control over the performed effect by the service recipient, we deal with continuous handing over of control. If the recipient takes over control over the performed effect once, after the fulfilment of the whole obligation, we deal with one-time taking over of control. There are the following methods of handing over control:

- over time;
- at a point in time.

Over time method of handing over control during the performance of the service obligation occurs when at least one of two conditions is met:

- The entity's actions consist in generating new components or the increase in the value of the already existing ones, the effects of which the recipient controls at the moment of their generation or increase in value.
- The effect of the contractor's action cannot be used by the purchaser in an "alternative" way (in accordance with the contract, the entity cannot sell work in progress to another recipient or the performed works are individual to such an extent that they cannot be the subject of transactions with other customers) and when at least one of the following criteria is met:
  - the service obligation effect takes over control over the service and uses the related benefits;
  - another entity which would be supposed to continue the performance of the service being performed, would not have to repeat works performed so far;
  - the entity has the right to payment for the service performed.

The first condition relates to situations where during the performance of the obligation that results from the contractor's contract, the arising effect of work is simultaneously controlled by the employer. The contract that meets this condition could be, for example, the contract for the execution of the assembly of professional equipment at the employer's (at the area under the employer's control, e.g. the assembly of a production line).

The second condition is more developed. It consists in making individual assessment of whether the effect arising as a result of the performance of the service obligation may be used by the employer in an alternative manner with respect to initial assumptions. If the recipient cannot sell the performed work to another customer or if it is very specific and cannot be used differently than intended, it is possible to declare the impossibility of the alternative use of the component and consider that the condition is met. This condition is met when the recipient receives and simultaneously uses the effect of the service, for instance, in case of training or consulting services (the first criterion). The second criterion relates to the case when another contractor (in case of changing the contractor) cannot repeat the work. The performed transport services may serve as an example of

this condition. The last point relates to the assessment of the right to payment. The contractor has the right to payment when it meets all conditions of the contract and the recipient cannot cancel the contract or when the receivable amount becomes due at the moment of cancellation. In case when the recipient has the right to cancel the contract and the due amount at the moment of cancellation becomes lower than the total contract amount, the criterion cannot be considered met. Even if the entity has the right to payment but an alternative application can be found for the performed services, it may not be assumed that the condition is met.

After declaring that the entity hands over control during the performance of works, the entity recognizes revenues for each service obligation identified using the percentage of completion method. The percentage of completion may be determined by applying the entry method (on the side of costs) and exit method (on the side of effects).

If the entity identifies too much uncertainty in connection with the measurement of percentage of completion and is unable to reasonably estimate profit and identify loss, it should recognize revenue up to the amount of costs incurred.

If, in the course of time, control is not declared during the performance of the service obligation, it is possible that the control is handed over at one point in time - at strictly determined moment. In such a case the other method of determining the moment of revenue recognition should be applied and this moment should be determined.

Over time control handing over method should be considered as the first one. If it is determined that the control is handed over in a continuous manner, the revenue is recognized over time during the contract performance, with the application of the percentage of completion method. If it is impossible to declare that control is handed over in a continuous manner, one moment of revenue recognition should be determined. In order to facilitate determination of this moment, the following conditions for the analysis were proposed in the draft:

- the contractor has the right to payment;
- the recipient took over the legal title;
- physical handing over of the component took place and the recipient has the possibility to direct the use and obtain economic benefits and it has the right to limit the access of the third parties;
- the risk and benefits have been transferred to the recipient;
- the recipient accepted the component.

The items given above are premises in nature. They are general in nature and leave much space for individual interpretation.

The Impact of the Proposed Amendments to the IAS 18 on the Valuation of Construction Services

For the study purposes, the author selected an example of IT service as a long-term service, the performance of which consists in the development and implementation of IT system. The service performance includes the following works and equipment deliveries:

- design preparation;
- software development;
- the preparation of specifications of equipment and software necessary to implement the system;
- the delivery of specified equipment;
- the system implementation.

The subject matter of the contract was the creation and implementation of the IT system, streamlining the IT system in the existing entity. The work of intellectual nature is to be the effect of the contract performance. The service cost structure is presented in Table 2.

Table 2

The Service Cost Structure

Item name	%
devices, equipment	7.49%
hardware	27.82%
installation	7.07%
software	11.49%
license rights	31.20%
training courses;	1.46%
others	13.47%
TOTAL	100.00%

Source: author's own study

In business practice the percentage method was applied for the valuation of the aforementioned contract. The distribution of revenue in particular years of the contract performance was presented in Figure 1. In accordance with the proposed solutions regarding the revenue in draft IAS 18, this distribution would be different. Pursuant to arrangements, the entity has two possibilities. The first possibility consists in separating two separate performance obligations: delivery of computer hardware [obligation 1] and the performance of implementation of works [obligation 2]. Hardware delivery was a single act with simultaneous handing over of control to the employer. The hardware sale

transaction price should be estimated on the basis of prices applicable in wholesale plus profit margin. The implementation of works would be valued in accordance with the percentage method, under the assumption that the control over the result of the rendered service is handed over for some period of time. The second possibility (not accepted by applicable regulations) is the application of the contract performance method, namely making the assumption that the control over the whole service along with the hardware has been taken over by the customer at the end of the performance of the whole contract. The distribution of the results at percentage method and the method proposed in the draft IAS 18 was presented in Figure 1.

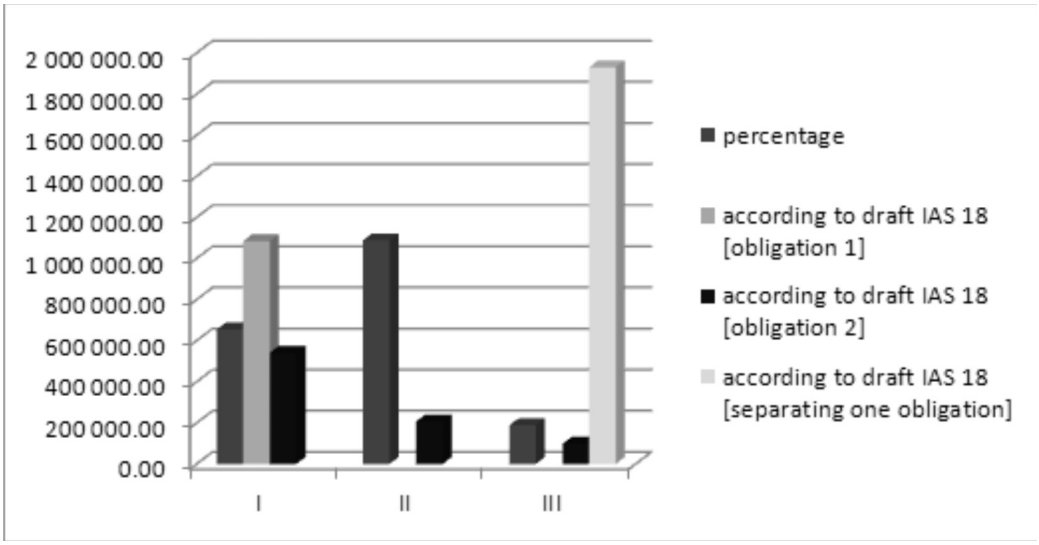

Figure 1. Recognition of IT service results at the percentage method and the method proposed in the draft IAS 18.

Source: own study

Applying previous solutions for valuation, approx. PLN 600,000 was recognized in the first year of performance. In the second year – over PLN 1,000,000, while in the last year the recognized profit was the lease and it amounted to less than PLN 100,000. According to the first possibility, the application of regulations of the draft standard results in the culmination of profit recognition in the first period of the service performance. Instead of PLN 600,000 the company would demonstrate the profit on sale of hardware and the part of profit on performed services, amounting to approx. PLN 1,600,000. In the following years the recognized amounts would be much lower than the ones recognized at the percentage method applied for the whole contract. The application of the other approach and revealing all results in the last analysed period

produces extremely different effect. As it results from the analysis of the specific example, the date of handing over the control becomes a very significant element of the service performance valuation because it is decisive of the date of recognition of revenues and corresponding costs in the profit and loss account. Determining the moment of handing over control has decisive impact on the recognition of revenues and simultaneously of the financial result of entities rendering long-term services.

Summary

The proposed new solutions regarding the recognition of revenue are very significant with respect to the valuation of long-term services. The adoption of the new solution regarding revenue recognition would certainly change previous solutions. The valuation burden would be shifted to other issues due to necessity to select a method. Taking a decision on separating services within one contract would be an important issue, as well as the necessity to determine the method of handing over control. These two steps separated in the project would be decisive for the valuation of long-term services as of the balance sheet date.

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GOVERNMENT EXPENDITURE: SOCIAL SECTOR EXPENDITURE AND ITS INFLUENCE ON THE ECONOMY OF LITHUANIA

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Abstract

This article aims at finding out how government expenditure for social sector influences the economic situation in Lithuania. In view of the fact that expenditure takes the major part in the whole government expenditure structure, it needs more attention. In order to find the relations, scientific articles and the official statistical data are analyzed. This article tries to substantiate the productivity of expenditure for the social sector, and shows how social expenditure affects the economy of the country. Resulting conclusions provide an answer as to whether the whole sector of social expenditure is unproductive, or maybe some parts of it can be assigned to productive ones.
Keywords: *government expenditure, social expenditure, unproductive expenditure, economic growth.*

Introduction

Government expenditure and public revenue are two major parts of the budget. There have been many discussions on the need to decide what the budget will look like, and these discussions are usually the object of manipulation in politics in order to attract voters and reach personal benefits as well. Those who idealize politics and its transparency would say that the budget was formed responsibly, and the expenditures for different sectors are distributed clearly. However, if we look at real facts and publicly known information, we can find that the programs of political parties are oriented towards specific sectors, which are awarded by government expenditure, and manipulation with them give these politicians the power to control people, their interests and opinion. Therefore, the government expenditure is one of the most important elements of fiscal policy that requires maximum responsibility. Most of the time, the old rules are applied when distributing the budget between the sectors because radical

reforms can affect these sectors negatively, if the government is not prepared for them, or if they are not implemented successfully. Depending on the economic cycle and ruling political party, the financing for some sectors may differ. If politics patronize some specific sector, the financing for it can increase and the funds from other sectors will be shifted to the patronized one. Of course, economic cycles influence financing, especially during the crisis. One of the most sensitive and significant parts in the government expenditure is social expenditure. The above-mentioned facts indicate that political manipulations and economic cycles influence the budget distribution and the economic situation in the country.

There are several different classifications of government expenditure given in scientific literature, but in order to show the benefits for the economy, the classification according to productivity is usually used. Government expenditure can be both productive and unproductive, and the positive balance between them and greater proportion of productive expenditure is indicative of country's ability to manage and allocate costs, while creating economic benefits and economic growth.

Social expenditure is one of the most important parts of public expenditure that gives direct benefit to a citizen. Benefits and social payouts are not taxed additionally and are not redistributed through other indirect agencies. Social expenditure, on the basis of the OECD distribution, is attributed to unproductive expenditure, but it can be presumed that such non-productivity is also influenced by unproductive decisions and inefficient allocation of expenditure for unworthy people, using corruption and nepotism. Social expenditure aims at solving the problems of poverty in a country, but thanks to corruption and nepotism – these payouts are often too small for those who need, and too high for those, who don't need and have additional earnings. These facts increase de-motivation and impede solving the problem of unemployment. The aspects of actuality suggest that productivity of social expenditure should be analyzed according to its inner structure.

The object of the article – the government social expenditure. **The aim** of the article – to do a research on the productivity of social expenditure. In order to reach the aim, there are several **tasks** introduced:

1) to analyze scientific literature and articles and give the knowledge of government expenditure;
2) to show the structure of government expenditure in Lithuania;
3) to show the part that social expenditure takes in all government expenditure;
4) to show the structural changes of social expenditure.

The **research methods.** The article is prepared by analyzing the scientific literature, performing general and logical analysis and synthesis of complex information.

The Concept of Public Expenditure

Government expenditure dates back to ancient times, when the countries had to fund the armies and part of country's income had to be used not only for the needs of country leaders, but also for country's defense. Later, state leaders started to think about other sectors of the country: the emergence of the law, which said that human rights have to be protected, influenced the emergence of certain social payouts from the country. Developing economy has changed an approach to public spending. Different economists have different perceptions of significance, purpose and need of public expenditure. A. Smith (1723–1790) believed that government should not intervene in the regulation of the economy because the economy is affected by market forces and it should develop itself. Meanwhile, British economist J. M. Keynes (1883–1946) talked about a regulated economic model, which states that, in order to stimulate the economy, it is necessary to increase government spending and cut taxes. Today's economy, if we leave other famous economists aside, is more in J. M. Keynes' economic concept than in A. Smith's, and already has its own researchers and economists who analyze various economic phenomena. One of many economic phenomena is government expenditure, which eventually became not only a tool for fair distribution of the money collected from tax payers, but also – a tool for political manipulation, which is wrapped in corruption, patronage, nepotism and selfishness.

A. Blais et al. (2010:6) in his work notes a trend that public expenditure increases when more political parties appear in the government. The dominant party is working under a political program, which provides the priority areas that should be financed. In case of several dominating parties in a coalition, each party has its own priorities, so public expenditure becomes more diversified and higher at the same time. This shows that public expenditure is closely related to politics, and is one of the tools used by politicians. S. A. Barrios and Schaechter (2008:4) recognize that the amount of public expenditure for the public sector reflects political views, which indicates that economic growth is not always in the first place – there are situations where the funds are allocated to social and public relation campaigns in order to be in favour with a certain a group of people (voters).

Public expenditure is widely analyzed by various researchers. According to J. Bivainis (2005: 5), we all, every day, in one or another way, deal with public expenditure. The structure of expenditure particularly influences country's economic growth (Szarowská, I., 2012: 36). Ž. Žaliauskas D. and Z. Lydeka (2013: 23) define public spending as the amount of money that the government spends over a certain period of time. They understand the government expenditure as the sum of money spent on certain functions within a certain period of time. Public expenditure can be called as one of the country's main elements of life, and without it the government could not function, and citizens' constitutional rights could not be ensured.

According to N. Gemmel et al. (2009: 16), changes in the structure of public spending are as important as the changes in the amount of public expenditure on economic growth. European countries can decide what will be the size and composition of the national budget – both income and expenses, but this approach has changed recently, and the new "quality government expenditure" approach is offered where the parties are encouraged to increase productive expenditure for public investment, research & development, for active labour market and in such way reduce the amount of non-productive spending (Ferreiro et al., 2012: 14). On the basis of these recommendations, a new growth model has developed, suggesting that fiscal policy structure changes in the country‘s revenue can accelerate the long-term economic growth and change unproductive expenditure to productive. R. Kneller et al. (1999: 20), N. Gemmell and R. Kneller (2001: 15), Bleaney et al. (2001:7), K. Angelopoulos et al. (2007: 1), A. Irmen and Kuehnel J. (2008: 19) wrote about this phenomenon.

The structure of public expenditure is a very important aspect in terms of allocation of public expenditure to various authorities. The economic classification of public expenditure is a useful tool to perform budget analysis in order to determine the country's fiscal position (Međedovic, 2011: 24). In terms of government spending, we have to admit that some of them are productive, and promote economic growth, while others – unproductive and hinder economic growth. Of course, the size of the country influences the size and needs of government expenditure (Senjur, 1996: 34). There are many studies where the government expenditure is divided into productive and unproductive. It was analyzed by A. Liubimova and G. Žigienė (2010: 22), Ferreiro (2009: 13), S. Villaume et al. (2008: 37), Ferreiro et al. (2012: 14), R. Kneller (1999: 20), S. Barrios and A. Schaechter (2008: 4), N. Gemmel and R. Kneller (2001: 15), N. Gemmel et al. (2009:16). Public consumption expenditure has a negative relationship with long-term growth, while public investment expenditure has a positive influence on economic growth (Olabisi & Funlayo, 2012: 26). This shows that it is necessary to classify public expenditure and assess the expenditure efficiency of each sector, highlighting areas that are productive and encourage economic growth.

When analyzing the government expenditure, it is necessary to perform revenue analysis as well as analysis of budget deficits or surplus (Sinevičienė & Vasiliauskaitė, 2011: 35). H. Al-Zeaud (2012: 18) forms a two-track approach to public expenditure. The researcher says that the expenses can be planned when we are sure about public revenue, and in another case, the budget revenue can be planned after you have planned public expenditure. In the first case, the country will save more, because at first the revenue is planned and only after that the expenditure is planned, so you cannot spend more than you collect. However, in this case, there can be sectors, which will not be provided with enough funding. In the second case, the country will spend a lot of money over budget, but will also have to take steps to collect them. In accordance with this principle, the government should change tax rates or the entire system, and the introduction of new taxes that would end in chaos and volatility. The second case can

also lead to potential overestimation of how much money the country can spend, and it would lead to dissatisfaction. In the first case, it is possible that, if the government knew the exact income, it would not spend all planned expenses, which are squeezed into the frames of income, while in the second case there is no guarantee that the state will collect enough revenue to cover planned costs. Therefore, it is possible that part of started projects or part of certain institutions may not receive enough funding to continue working. This approach suggests that the government should first plan country‘s income and expenses should be planned afterwards, otherwise its fiscal policy will not be efficient.

Government expenditure is a very important part of each country's budget, and economical system, because the formation of unproductive expenditure and its inefficient distribution can lead to poor economic situation in the country (Račkauskas & Liesionis, 2012: 30). This can occur when there is no strict goal to increase productive expenditure in economic policies. And if, instead of that, there is a hope of good rating, public adulation and satisfaction when manipulating social benefits, then unproductive expenditure is increasing, as well as the government debt for future generations.

Social Expenditure in the Context of Government Expenditure

As we already understood, government expenditure is a very powerful tool of public management. Those who form the budget determine, which sector this year will live “better”, and which politician will receive more praise, and at whose expenses it will be implemented. The government cannot be heroic Robin Hood, depriving from the rich and distributing to the poor, and should work according to the principles of justice and efficiency when allocating money brought to the budget by everyone. Social expenditure is the most sensitive area of public expenditure that should take care of almost all the miserable – both socially, if we are talking about unemployed people, and morally, if we are talking about retirees. If a political party wrote a generous and assertive political program, it depends whether they will be selected and have the opportunity (but not the obligation) to implement their election promises. In order to implement something, a fair political consensus, strong economic justification and evidence showing should be done in order to find which path of public expenditure distribution is the fairest and most effective. History shows that public expenditure for the social sector helps to survive and escape from poverty; it directly affects the economic growth and such help is greatly appreciated by citizens (Bojanić, 2013: 8).

If there is a significant public sector in the country, compared with the private sector, it is likely that the state will have more and more public expenditure, and if the economy fluctuates, public expenditure will increase, which will increase the public debt as well (Račkauskas, Liesionis, 2011: 28). Various social benefits, which are particularly high during the recession, form a significant proportion of unproductive expenditure. Sanz

(2011: 33) says that reducing of public sector will not necessarily reduce government spending, but may change the composition of public expenditure: if some sectors are protected, the others suffer. This means that during the crisis, a particular attention will be given to only one area – social benefits, which are classified as unproductive, and many other productive sectors will be abandoned – the sectors that intend to show good image of the country, sectors that work for county's expansion and economic growth, attract new investors and create new businesses.

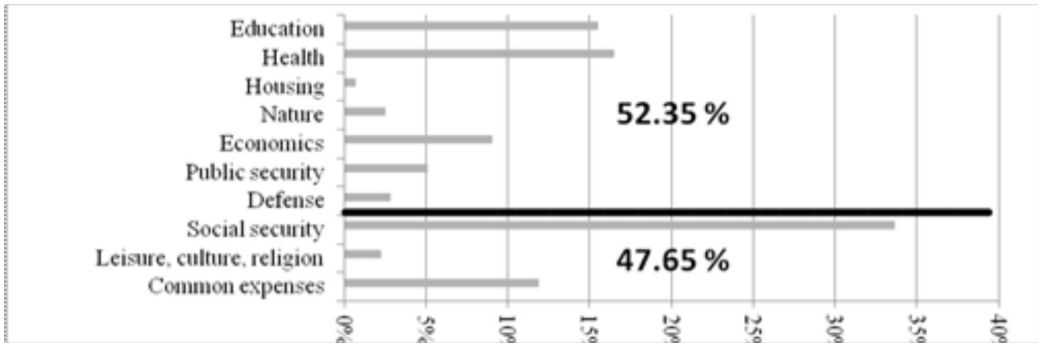
According to N. Roubini and J. Sachs (1989: 32), the government expenditure in the economic downturn is being decreased, using productive expenditure, because the social benefit cuts are politically useless and the public reaction can be tremendous. In the scientific literature dealing with public expenditure, we can meet another description of productive expenditure – public investment. Public investment, like other investments, is used to provide some benefit or profit for the country. This complements an assertion by Sanz (2011: 33) that by saving at least rigid – productive expenditure during the crisis, non-productive expenditure can be increased. To ensure the economic growth and increase productive expenditure investment in the government expenditure portfolio, it is necessary to reduce social benefits and diversify expenditure. H. Oxley and J. P. Martin (1991: 27) wrote that it is always easier to suspend investment (savings, productive expenses) than today's consumption (unproductive expenses – social payouts). The recent enormous consumption has brought the world to the deep economic recession where the financial crisis morphed into an economic, banking, and finally – a systemic crisis.

We have to admit that government expenditure is necessary, because it performs not only the function of an incentive, but also helps to solve social problems, and affects country's economic growth. H. Irmen and J. Kuehnel (2008: 19) argue that unproductive expenditure is instantaneous, affecting the short term, while the productive expenditure – has a long-term impact and lasting value (Račkauskas, Liesionis, 2012: 30). C. Aubin (1988: 3) argued that reducing the productive expenditure has a greater political impact than of unproductive expenditure, because the decrease in social expenditure is more pronounced in the society. The social benefit cuts influence the rise of public indignation, while cuts in productive spending influence the interests of only a particular group, which are quickly filled with higher future investment promises. Therefore, the effects of public spending largely depend on political power, which, depending on the economic situation, adopts decisions that might be favourable to politicians and the country, while less favourable for the public. This is confirmed by H. Irmen and Kuehnel J. (2008: 19) who argue that economic growth and the allocation of resources for productive expenditure is highly dependent on political strategy. R. I. Murota (2007: 25) argues that increase in inflation is understood as an additional tax for the money because by increasing the price of goods it seems that we overpay, so higher inflation may reduce the household spending. Inflation is a sign of country's economic growth, affecting increase in productive expenditure (in a good economic situation less money is

spent for unproductive expenditure, social payouts), so there is bigger proportion of funds allocated to the funding of productive sectors. However, rising inflation has a negative impact on the productive expenditure because it reduces the value of created benefits, even if the increase in money supply increases the volume of productive spending (Murota, 2007: 25).

According to functional classification, there are the following unproductive sectors: social protection, expenditure on general public services, and expenditure for recreation, culture and religion. A. U. I. Clement and E. O. Dickson (2010: 10) classify government expenditure into recurrent expenditure and capital expenditure. Recurring expenditure is not accumulated and is intended to be consumed, because it is funded each time anew. Meanwhile, capital expenditure has lasting accumulative value, and is used for long-term investment. Social benefits and allowances are classified as unproductive not only because they do not create economic value, but also because they do not motivate others. Paying benefits to unemployed, the country partially satisfies its needs and inhibits the desire and motivation to work. Most people perceive the social costs as the expenditure for the sick, the disabled, pensioners, large families, the unemployed and various other types of benefits and other similar expenses. However, the researchers argue that social protection hampers economic growth (Gwartney et al. (1998: 17), Arjona *et al.* (2003: 2)). There are also other ideas that support this opinion – it is stated that the social cost is a barrier to equity and efficiency growth that can lead to decrease in economic innovation and entrepreneurship in the country (Ezcurra, Rodriguez-Pose, 2009: 12).

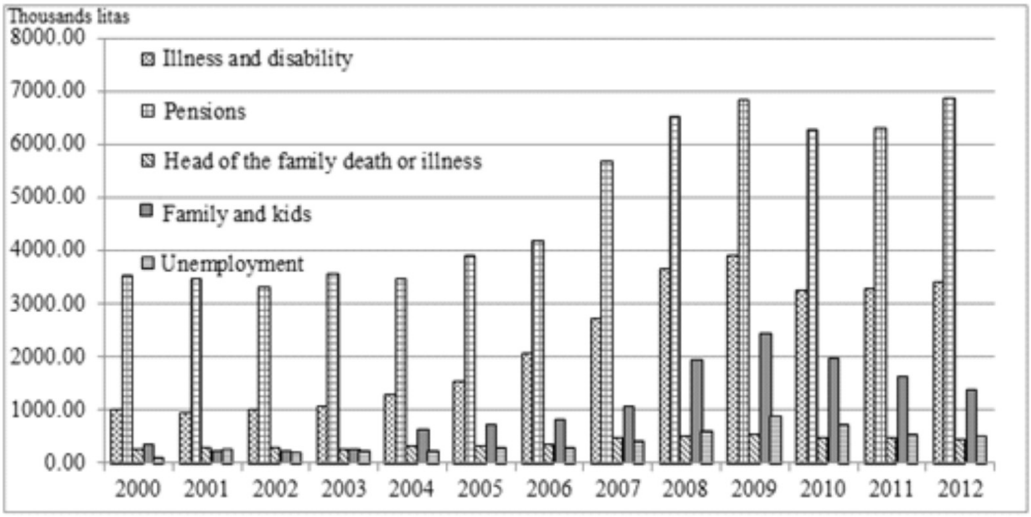
Economists unanimously agree that social spending is unproductive and has a negative impact on the economy, but there are other scientists, who express their views and have seen different trends. For example, sociologists and political scientists argue that higher social expenditure is creating not only smooth and harmonious society, but is also good for economic growth (Korpi, 1985: 21, Castles, 2005: 9). We can neither agree nor disagree with this statement because there are more of those who have investigated the negative impact of social expenditure on economic growth. For example, M. Ravallion (2002: 31) divides public spending into social and un-social, and here rises a problem, because some part of social expenditure can be productive, and another – unproductive, so it is accepted that it is more appropriate to divide government expenditure according to their productivity and benefit for the economy. Sociologists and political scientists claim that social expenditure can create economic growth, and it may be true if the country is rich enough and does not require additional borrowing to finance this expenditure. If the country borrows and spends these funds for unproductive sectors, it increases unproductive expenditure twice: not only the contributions for public debt management, but also the social payouts for unproductive purposes.



Source: Figure made by author, according to Department of Statistics of Lithuania

Figure 1. The distribution of government expenditure between the sectors in 2013

Figure 1 presents the distribution of government expenditure in 2013 among the sectors. It shows all sectors of expenditure – both productive (top) and unproductive (bottom). As you can see, the greater part of whole government expenditure in 2013 was dedicated to productive expenditure, and unproductive expenditure took a smaller part. Nevertheless, the part of social expenditure is the greatest and takes about 1/3 of all government expenditure – this is why this sector is so important. This figure shows that the Lithuanian government is able to control expenditure and keep the balance positive.



Source: Figure made by author, according to Department of Statistics of Lithuania

Figure 2. The dynamics of social expenditure inner structure

Figure 2 shows the inner structure of social expenditure and its dynamics during the period 2000 till 2012. The social expenditure has the following composition: illness and disability, pensions, death or illness of the head of the family, family and kids, unemployment. As we can see, every part of social expenditure was increasing till the economic crisis. Pensions form the largest component of social expenditure that was reduced during the crisis – we can see a decrease from 2010. It should be mentioned that from 2012, pensions rose to the pre-crisis level. Further analysis showed that the share of pensions was decreasing in the social expenditure portfolio. However, it is believed that the statistics of the previous year (2013) and this year (2014) will show an increase, because the government started to pay back the underpaid pensions. We can observe a slight increase in unemployment expenses during the analyzed period and a substantial increase in expenditure for disability and families. The biggest part of expenditure for families is maternity benefits. This increase was influenced by the social reform and, of course, the fact that during hard times the production decreases – so there is greater possibility to be dismissed. So, if somebody let you choose – to be fired or have a kid and assure income for the next two years, you would probably have a kid. But this is not a bad thing – we should take a better look at expenditure for illness and disability. An increase during the crisis and current stability make us feel that we are using government expenditure ineffectively, because we give privileges, using corruption and nepotism by letting "able" people to become "disabled", what assures income for them. This can be perceived as a theft from every one of us, and the worst thing is that disability usually takes much longer than the maternity period.

Conclusions

After analyzing the concept of public expenditure, we can conclude that a lot of researches have been made on government expenditure. There are authors who analyze government expenditure according to its productivity, but there are also others, who try to find other type of classification, for example, the type of expenditure instead of productivity. But if we want to analyze the influence on the economy, we should use the productive – unproductive classification.

The situation in Lithuania is not bad, because the structure of expenditure showed that the greater part of expenditure is productive. However, this analysis requires additional and deeper investigation of the inner structure of each sector of expenditure. When making such analysis we can clearly see the influence of economic cycles on government expenditure and its dynamics. The analysis of social expenditure also requires additional analysis of inner structure in order to evaluate if all types of social expenditure are unproductive.

When analyzing the statistical information about the unemployment level, it was seen that the expenditure acts in accordance with the traditional theory – it increases during

the crisis and decreases when it ends. As regards disability payments, this expenditure increases and stabilizes when the crisis strikes, and does not decrease at the end. This increase is a bit strange, but understandable – it is a possibility to become disabled and claim for benefits – that is a unique example of corruption, nepotism and possibility to assure income during financially hard time. It would be nice, if those disabled people became "able" again. Very similar situation was noticed with maternity benefits – it rose when the crisis stroke, because it is a way to keep household income, and it reduced when the maternity period ended and the crisis was approaching the end as well.

The analysis of literature and scientific studies showed that most researches end with common conclusions without any continuation: the changes and relations are showed, and the problem is analyzed again after a period of time in order to see the changes in statistics. However, there are no researches, which analyze and evaluate the productivity of social expenditure, so we believe that there is the need for a profound research that finds out the productivity of each type of social expenditure, and it would be innovative and appropriate to apply in reality by distributing government expenditure more productively.

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THE ORGANIZATION AND FINANCING OF CLINICAL HOSPITALS IN POLAND – SELECTED ASPECTS OF ACTIVITY

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Abstract

The present article describes selected aspects of clinical hospitals in Poland. They are a very important link in the Polish health care because they implement three very important functions: medical by providing health benefits, educational in reference to teaching medical staff, and the scientific one related to the implementation of new medical technologies.
In view of the fact that the university clinics usually get patients who are the "difficult cases", there are lots of expensive medical procedures. Additionally, the costs increase because the medical staff is engaged in scientific research and teaching. The article highlights the role of the hospital management under these conditions. The clinical hospital, despite its close relationship with the university, is a completely independent entity. Therefore it should also balance its activities.
It is worth emphasizing that except for a few areas, which are typical only of management of therapeutic entities, e.g. complex agency relations, specific legislation, problems with close identification with the hospital academics, university hospitals use the same financial management tools as other operators on the market.
The main objective of the article is to highlight the difficulties in reconciling the economic criteria of university hospitals' activities with fulfilling their statutory mission. It presents the current rules of the organization and financing of university hospitals and indicates the desired directions of changes in order to increase the efficiency of the allocation of financial resources.
Keywords: *healthcare, clinical hospitals, management of hospitals, teaching base of medical schools.*

Clinical hospitals constitute a very important issue in the Polish health care. They perform three very important functions: treatment through the provision of health services, educational training related to medical staff and scientific function with reference to the introduction of new medical technologies. However, these entities are subject to the market with all its consequences, including the possible liquidation.

Health care is a kind of product that, despite its unique features, is subject to the basic economic principles.

In order to better understand the problems related to the functioning of these entities, the author of the article presents a brief description of the Polish health care activities. The changes in the legal form of clinical hospitals and selected aspects of their functioning are outlined. This article is an attempt to answer the question of whether it is possible to reconcile the economic criteria of clinical hospitals with their statutory mission. The objectives are to:

1) characterize the functioning of the Polish health care system, indicating the role of clinical hospitals;
2) identify the factors that determine the activities of university hospitals;
3) propose changes in the organization and financing of clinical hospitals.

The choice of the theme of the article was determined by direct observation of relations in the area of clinical hospitals.

Although the functioning of healthcare entities is already of interest of many researchers, there is still a large gap in the area of literature concerning clinical hospitals. It is associated with the barrier to access reports and detailed information of hospitals. Some conclusions are based on the practice and interests of the author (working as a Chief Financial Officer in one of the university hospitals).

A Brief Description of the Polish Health Care

The health care system in Poland is based on total cooperation of three groups of entities: providers, payers, beneficiaries. The main source of funding is public funding (insurance system), and the largest payer is the National Health Fund (operating since 2003). It manages the contributions from public health insurance and insurance payments of farmers. Mandatory health care contribution is 9%. Medical benefits are also funded directly from the state and local government budgets. Therapeutic activities are conducted by both public and private medical entities, functioning under different organizational and legal formulas (Nojszewska, 2011: 202). There are principles of evaluation of medical procedures applied in hospital health care based on the so-called system of homogeneous groups of patients (DRG system). It is based on qualification of completed hospitalization for a particular group, which in turn is based on the homogeneity criterion of medical benefits, the degree of resource consumption, duration of hospitalization (Mazur, 2010: 296). The low level of funding for the health care system results in reduced availability of medical services. It is also reflected in the quality of wider resources to be used by clinical hospitals.

The first solutions for university hospitals were introduced by the Act of October 28, 1948 on public health facilities and planned economy in healthcare. A clinical hospital was defined as a unit, in which all or most of departments were used for the purposes of higher school clinics. The priority tasks were therefore carried out by universities. Then, by the provisions of the Act on Health Care of 30 August 1991 – medical schools lost their influence on clinical hospitals, and therefore a didactic base. They have become subordinate to the Ministry of Health. Subsequent legislative changes in December 1998 stipulated that a clinical hospital functions as a clinical medical school created, transformed and liquidated by the Senate of the university. The provision was repealed after one year.

Amendments to the Act on Health Care of December 30, 1998 enabled clinical hospitals to acquire legal personality. They became independent public health care establishments. Their founder was the Minister of Health. Some of the powers in this subject were transferred to universities by the Minister of Health. The attempt to find a compromise between the impact of the Ministry and the influence of the university clashed in several areas, including the conclusion of the agreement on the provision of premises for teaching, approving the statutes, decisions on the marketing of property and equipment, the approval of the financial statements, as well as methods and modes of subsidies.

Subsequent legislative changes of October 2001 provided that the goal of clinical hospitals' activities was set. It was teaching and research in relation to the provision of health services and health promotion. There was a close functional relationship of medical universities with clinical hospitals sanctioned, while maintaining the legal separation of the two entities. Medical schools became the founding body for clinical hospitals, which provided them with didactic base. Clinical hospitals obtained unambiguous organizational subordination. Universities had to face new tasks, including adaptation of the statutes, appointing the social board, adjustment of organizational changes such as the creation, liquidation, merger of organizational units, defining the principles of purchase and accepting donations of medical equipment and apparatus or marketing rules, lease or rent of fixed hospital assets. Moreover, the property rights were regulated and the principles of supervision were set. The Minister of Health committed himself to determining a list of clinical hospitals, government medical colleges and state universities engaged in teaching and research in the field of medical sciences, which can assume the powers of a founding body, to determining the manner and procedure for allocation of grants for clinical hospitals and subsidies to cover costs of education and capital expenditures (Paradowski, 2001: 1).

The current legal relationship is defined by the Act on Medical Activity of 15 July 2011. Given that hospitals are clinical entities of particular importance, may be it would be a good solution to separate the Act on Clinical Hospitals, which would sanction their role in the health system, define their mission from the point of view of citizens' health security, and clarify the issues of financing in connection with the teaching university.

Without the action in the scope of management and financing, the clinical hospitals will not be able to fulfil the assigned public mission.

The Potential of Clinical Hospitals and the Problem of Debt

According to the information posted on the website of the Ministry of Health, there are currently 42 entities classified to the group of clinical hospitals in Poland (Ministry of Health: 2013). This is not a complete database of medical teaching colleges. It is composed of more branches located in hospitals, medical universities for which the authorities are not founding bodies. From the standpoint of the number of beds, educational potential constitutes about 9.3% of the total number of beds in Poland (Central Statistical Office, 2013: 166).

There are entities among the hospitals with a turnover of a few to several hundred million polish zloty. Unfortunately, they also include those medicinal entities whose debt has been growing for many years. The remedy for decreasing debt may be a change of legal form, which is allowed by the current rules. Unfortunately, the choice of this solution deprives clinical hospitals, among others, of financing for teaching because as entities operating in the form of companies they cannot be subsidized from the public funds. The benefit would be to use the option of redemption from obligations of the public law. Reflections on the need for transformation of teaching hospitals are very controversial. A company formed by the medical school with the aim to carry out teaching and research tasks in conjunction with the provision of health services and health promotion, incl. the implementation of new medical technologies and treatments, can in the structure of shareholders or stockholders have outside the University of Medicine (min.51%), only the State Treasury, a local authority or a company wholly owned by the Treasury that is of particular importance for the economy of the state. For proponents of transformation, the lack of involvement of external investors, e.g. private, is a serious limitation; however, it seems to be a guarantee for maintaining the structures of the state of this particular kind of business.

Stakeholders of Clinical Hospitals

Environment of clinical hospitals is prone to all kinds of influences – political, legal, economic, i.e. of other companies, banks, economic indicators, such as inflation, tax rates, as well as influence of the main payer for services – the National Health Fund, which often at short notice imposes specific business requirements on medical entities. Failure to comply with them imposes the risk of penalties that reach 2% of contract value. At present, the National Health Fund is an absolute monopolist in the health care system in Poland.

The staff plays the key role in the relations with the unions. As the authors of the report "Opinions of Employees of LiuGong Machinery Poland in Stalowa Wola on their Work in the Context of Globalization" trade unions perform many important functions in almost every workplace. They have a special legal status and are appointed to represent and protect the interests of employees at all levels: social affairs, economic, or professional level. They are able to represent their interests more efficiently than a single employee because of their structure and legitimacy (Dłubacz, Łuka, Rewera, Więckiewicz, Ziemba 2013: 48).

There are often several organizations of this type in the hospital whose members are engaged in every area, i.e. the medical staff, nursing, administration. Constructive cooperation with trade unions is very important, because they provide an opinion on most issues in the area of payroll, including the rules of remuneration. Lack of understanding and acceptance of the decisions taken by the management may hamper or even paralyze the functioning of a hospital. It is worth noting that in many cases the costs (defined as the salary similar to those of the employer's) exceed the level of 70% of the turnover. Increasingly, alternative employment under a contract of employment is a contract that offsets the cost of the items of remuneration to the position of third party services. From the management point of view, it is a more convenient position because this kind of staff is treated like any other supplier. It deprives of the possibility of membership in trade unions. It also deals with liability distribution for damages resulting in the treatment process.

The hospitals – clinical entities with universities as their founding body, face the requirements for teaching and scientific research. A university does not usually have the grants in the amount that is sufficient to cover costs on the side of the hospital. The medical staff involving also academic employees may have the problem with the unequivocal identification of a single employer. On the one hand, they are obliged to the continuous expansion of scientific achievements, but on the other hand, they should be aware that additional research, broadening diagnostic, generates costs that should be covered by a specific funding. The study of young doctors generates the specific costs on the side of the hospital that are not included in the valuation of the NHF. This applies to both the cost of materials, such as gloves, gowns, masks, and personal costs – examination of a patient with the participation of students lasts longer than the standard examination, which in turn results in the extension of the duration of service.

As highly specialized centres, clinical hospitals usually take care of patients with complex diseases, thus requiring expensive treatment. Not infrequently these are services that are not covered in the valuation, based on which the payment is made by the National Health Fund. This is about expensive diagnostics, treatments and also "readiness to work". Thus difficult patients require the involvement of highly qualified and consequently better paid personnel. In this case the so-called the "moral hazard" may occur. In the literature on health care it is attributed to patients and physicians. The

former, seeing the treatment as being free, want to be treated with expensive procedures, which may sometimes differ from clinical justification. Doctors, however, would like to be effective and often do not see the connection between the therapy methods used and the level of service costs (Nojszewska, 2011: 28). Yet clinical hospitals may be exposed to the occurrence of moral hazard on the part of a third group, namely other therapeutic entities. They want to "move" to the university clinics more complicated and thus more expensive therapeutic cases.

Clinical hospitals carry out financial management based on the financial plan and are subject to most of the rigors of the market. Hence the efforts of the management of these institutions are made to balance or enable the hospital to cover costs incurred from earned revenues. In this respect, there are controversies about whether standard procedures should be implemented in a clinical hospital or at least what should be their share in the total contract. Undoubtedly, they can constitute certain "possibility" to improve the financial situation.

In a sense, we are dealing with conflicts of interest. The university authorities, treating the hospital as a scientific and teaching base, may seek to maintain it in the structure of clinics, departments serving education. In turn, the management will have in mind the financial impact that these cells generate.

Teaching activities carried out by clinical hospitals are particularly important in the face of trends that have been emerging for several years in Poland, namely the increase in the number of patients with the decline in the number of beds in hospital care. A positive factor to be observed is the growing number of professionals working with patients in such areas as surgery, psychiatry and family medicine. In many areas, however, there is a lack of specialists what results in aging medical staff, a lack of people willing to do some specialization, migration of specialists to other countries, increased demand for certain specialization of physicians resulting from advances in medicine and aging population (Central Statistical Office, 2013: 68).

Services Provided over the Contract Value

The principal legal act regulating the activities of medical entities is the Act on Medical Activities. Article 15 of the Act regulates the provision of health services in the state of danger to life or health. The hospital cannot refuse assistance, although in many cases the interpretation of the National Health Fund is not identical, and the situation of hospital contract exhaustion cannot account for services they provide. Often the potential of clinical hospitals is much greater than the value of the contract signed with the National Health Fund. Current regulations classify clinical hospitals on parity basis with all the medical institutions in Poland, without taking into account their specific characteristics. The NHF valuation does not take into account where the patient is being

treated, and thus the simplest cases go to the private clinics. The clinical hospitals deal with the most complex cases that lead to increased debt.

Selected Restructuring Activities

Clinical hospitals, like most hospitals in Poland, are struggling today with a number of organizational issues and financing. This is due to the rapid development of medicine and medical technologies, the already mentioned phenomenon of an aging population and changing preferences of patients. In response to these phenomena, infrastructure of clinical hospitals must be subject to restructuring and this phenomenon is inevitable and entirely predictable. It is recommended for undertaken changes to be of iterative and long-term character, serving a clearly defined strategy, and not an ad hoc problem solving (Kozierkiewicz, 2011: 7).

An important problem in this case is the investment area. Asset base of clinical hospitals in many cases requires a thorough alternation as many of them do not meet the standards imposed by the Regulation of the Minister of Health of 26 June 2012, laying down detailed requirements for premises and equipment of the entity performing medical activities. In the absence of own funds to carry out adjustments, they first try to obtain funding from grants, then from the loan, and in the absence of credit they begin to analyze their partnership with a private entity (the so-called public-private partnership). It is difficult to say whether in such a situation the decision as to the investment was the result of cost-effectiveness analysis. Looking at the situation from this perspective, it is difficult to disagree with the argument that a public entity is somehow hard-pressed and therefore may be more willing to make concessions to the private partner.

Hospital investments relate to both hospital construction area and the purchase of new apparatus and medical equipment. Each issue arises numerous concerns in the preparation stage. In the case of construction projects, a decision is need on the mode of implementation (design and execute or "design and build"), the choice of a replacement or an external investor or a decision to rely on their own construction supervisor, and finally apply the cost estimate or a lump sum. The purchase of medical equipment may be dictated by natural wear out of equipment, the implementation of new technologies or the requirements of the National Health Fund. It is worth remembering that the expenditure incurred on the purchase of equipment generates additional costs for the hospital in the form of maintenance costs, the cost of consumables, or software updates.

The most extensive ranges of restructuring include costs. Due to the fact that the cost structure constitutes the largest share of personnel costs, they are most often subject to changes. We are talking both about their reductions through redundancies and changes in forms of employment, or the introduction of incentive pay systems related to budgeting branches. The second largest group includes the costs of medicines, materials

and disposable equipment. The type of medicines used in the hospital determines hospital formulary, which should be examined by the board of clinicians. In addition, to optimize the component of costs there should be included hospital pharmacy and the people involved in public procurement (Rój, 2011: 143). Clinical hospitals often use a management tool – outsourcing. This applies mainly to support of core business processes such as laundry, cleaning, catering for patients. Increasingly, these are also activities related to hospitalizations of patients, such as laboratory services. Outsourcing can be an effective method, provided that while choosing this method a management shall be guided by the criteria guaranteeing high quality of outsourced services with simultaneous reduction of costs. One should bear in mind that this method of increasing efficiency does not work for the indebted entities and legal conditions, which are subject to these entities, restrict the ability to build long-term outsourcing relationships (Lewandowska, 2010: 226).

Conclusions

Clinical hospitals are therapeutic entities which are assigned a special role in the health care system. From the analysis of selected aspects of their functioning, it is possible to draw the following conclusions:

1) There are many stakeholders of clinical hospitals, often manifesting diversified approach to their operation.
2) Scientific-research activity significantly affects the efficiency of a hospital.
3) The current system of funding allocation for health care promotes pro-quality activities to a limited extent.
4) Due to the high share of personnel costs in expenditures of hospitals, a rational personnel and wage policy plays a key role.
5) Improving the efficiency of clinical hospital resource utilization is reflected in the increased availability of health care.
6) Freedom of choice of medical technology has a significant impact on the costs of the hospital.
7) Successful restructuring of the hospital does not require changes in organizational form, including ownership, but mainly emphasis on the quality of management and determination in the implementation of planned activities.

The article can also be considered as an introduction to the deeper research and attempts to answer additional questions: what should be the target structure of legal teaching hospitals? How strong should be a relationship with the university? What additional management tools could help to increase the effectiveness of clinical hospitals?

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